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Application form mySNF

Instrument **MAPS**

Part 1: General Information

Basic data

Project Title	Strategy for the Development of Billiards as an Adaptive Sport (Para-billiards) Globally
Project title in English	Strategy for the Development of Billiards as an Adaptive Sport (Para-billiards) Globally

Research Field	Social sciences
Main Discipline	10602 Health
University	Eidgenössische Hochschule für Sport Magglingen - E

Applicant(s)

Main Applicant	**Viktoriia Nagorna**
Other applicant(s)	Mario Baic
	Vladimir Potop

Grant Application

Amount requested (CHF)	Total	**1'050'000**

Requested starting date	**01.05.2025**
Duration (months)	**48**

Attachments

Research plan	SciencePart_Nagorna.pdf
CV and major achievements	CV_Nagorna_2024.pdf
	CV_MarioBaic_eng2024.pdf
	CurriculumVitae_Potop.pdf
Cover letter	CoverLetter_Nagorna.pdf
Other annexes	D1_Declaratieprivindnefinantareadinaltesurse.pdf
	D2_Declaratieinstitutie_organizatiedecercetare.pdf
	D3_Declaratieeligibilitateafinanciaraainstitutieigazda.pdf
	D4_Declaratieinstitutieprivindacceptareaimplementariiproiectuluiininstitu
	D5_Declaratie_TVA.pdf
	institutionalsupportletterCroatia.pdf
	administrativeformkif34723.pdf
	LetterSNSFCommitmentFOSPO-sig.pdf

1. Responsible applicant

Last name	**Nagorna**
First name	**Viktoriia**
Function (title)	PostDoc
Academic degree	Dr./PhD
Date of birth	11.03.1981
Gender	weiblich
Swiss social security number	
Language	Englisch
Nationality	Ukraine
Correspondence address of application	Address of workplace

Home address

Address supplement	
Street, No.	Neu`Chemin 3A
P.O. Box	
Postcode / Zipcode	2533
Place	Evilard
Country	Schweiz

Address of institute

Name of Institution 1 (e.g. laboratory) *	Swiss Federal Institute of Sport Magglingen
Continuation 1 (e.g. inst /dept.)	
Continuation 2 (e.g. University)	
Street, No.	Hauptstrasse 247
Address supplement 1 (e.g. building)	
Address supplement 2(e.g. office)	
P.O. Box	
Postcode / Zipcode	2532
Place	Magglingen/Macolin
State, canton, etc.	
Country	Schweiz

Communication

Secretariat line	
Switchboard	
Direct line	
Fax office	
Home telephone number	
Cellphone	+41793524451
Website	
E-mail address	viktoriia.nagorna@baspo.admin.ch

2. Consortium partner

General information

Last name	**Baic**
First name	**Mario**
Function (title)	Dean, prof.
Academic degree	Prof. Dr.
Date of birth	26.02.1974
Gender	male
Language	English
Nationality	Croatia
Correspondence address	Enter my own working address

Address of institute

Name of Institution 1 (e.g. laboratory) *	University of Zagreb, Faculty of Kineziology
Continuation 1 (e.g. inst /dept.)	Faculty of Kineziology
Continuation 2 (e.g. University)	University of Zagreb
Street, No.	Baranoviceva 10
Address supplement 1 (e.g. building)	
Address supplement 2(e.g. office)	
P.O. Box	
Postcode / Zipcode	10000
Place	Zagreb
State, canton, etc.	
Country	Croatia

Communication

Secretariat line	+38513658666
Switchboard	
Direct line	
Fax office	+38513634146
Home telephone number	
Cellphone	
Website	
E-mail address	dekanat@kif.unizg.hr

General information

Last name	**Potop**
First name	**Vladimir**
Function (title)	Professor
Academic degree	Prof. Dr.
Date of birth	31.07.1975
Gender	male
Language	English
Nationality	Romania
Correspondence address	Enter my own working address

Address of institute

Name of Institution 1 (e.g. laboratory) *	National University of Science and Technolog
Continuation 1 (e.g. inst /dept.)	Dep. of Physical Education and Sport
Continuation 2 (e.g.	Faculty of Sciences, Physical Ed. and Inform

University)	
Street, No.	Targun din Vale, 1
Address supplement 1 (e.g. building)	
Address supplement 2(e.g. office)	
P.O. Box	
Postcode / Zipcode	110040
Place	Pitesti, Arges
State, canton, etc.	
Country	Romania

Communication

Secretariat line	+40348453102
Switchboard	
Direct line	
Fax office	+40348453123
Home telephone number	
Cellphone	
Website	
E-mail address	rectorat_cup@upb.ro

3. Project partner(s)

4. Applicants' employment

Information on employment and function at the anticipated starting date of the grant

Name	**Nagorna, Viktoriia**
Employment at the anticipated starting date of the grant	permanent contract
Level of employment %	50
Function in the context of this grant application	Postdoc, Research associate, Resident physician
Professorship	Associate professor
Doctorate (PhD)?	Yes
Date of doctorate (PhD)	19.10.2009
PhD supervisor	
Country of doctorate	Ukraine
Remarks	
Further employments	

Information on employment and function at the anticipated starting date of the grant

Name	**Baic, Mario**
Employment at the anticipated starting date of the grant	permanent contract
Level of employment %	100
Function in the context of this grant application	Group leader, Senior physician
Professorship	Full professor
Doctorate (PhD)?	Yes
Date of doctorate (PhD)	05.06.2006
PhD supervisor	
Country of doctorate	Croatia
Further employments	Dr., prof. Mario Baic is a Dean of the University of Zagreb, Faculty of Kinesiology

Information on employment and function at the anticipated starting date of the grant

Name	**Potop, Vladimir**

Employment at the anticipated starting date of the grant	permanent contract
Level of employment %	100
Function in the context of this grant application	Group leader, Senior physician
Professorship	Full professor
Doctorate (PhD)?	Yes
Date of doctorate (PhD)	23.04.2004
PhD supervisor	
Country of doctorate	Romania
Remarks	PhD in Physical Education and Sport Doctoral dissertation topic: Adjustment of motor behavior in the learning and improving high-difficulty elements in women's artistic gymnastics. National Academy of Physical Education and Sport Bucharest 29.09.2016 - Diploma of Doctor of Physical Education and Sport The National University of Ukraine on Physical Education and Sport in Kyiv, Ukraine
Further employments	

5. Basic data I

Original title	Strategy for the Development of Billiards as an Adaptive Sport (Para-billiards) Globally
Title in English	Strategy for the Development of Billiards as an Adaptive Sport (Para-billiards) Globally
Requested starting date	01.05.2025
Duration (months)	48
Research field	Social sciences
Further research fields	Humanities
	Medicine
Main discipline	10602 Health
Sub-discipline(s)	30905 Rehabilitation

6. Basic data II

Summary	The concept of adaptive sports, a powerful tool for social integration, has yet to embrace the potential of Para-billiards fully. Unlike other adaptive sports, Para-billiards, which include various cue sports like pool, snooker, and carom, offer a unique blend of strategy, precision, and camaraderie. This rich history and significant cultural presence worldwide make it a compelling choice for athletes with disabilities. However, its adaptation as a sport for these individuals still needs to be developed. This strategy aims to explore and promote the development of Para-billiards as an adaptive sport globally, enhancing inclusivity and providing competitive opportunities while preserving the heritage and spirit of the game. Our research aims to increase the integration of persons with musculoskeletal disorders into sports activities such as billiards by implementing innovative strategies and developments in the inclusive training and competitive process. To achieve the primary goal of our project, we plan to accomplish the following tasks: 1. Determine the most objective state of adaptive billiards at the international level; 2. To substantiate strategy for the development of billiards as an adaptive sport (Para-billiards) globally; 3. To prepare the official programs of educational and training sessions in billiards (pool) for persons with disorders of the musculoskeletal system; 4. To develop the official education programs for trainers who coach athletes with inclusions (adaptive billiards for example); 5. To define the level of influence of billiards training on the psycho-physiological condition of persons with disorders of a musculoskeletal system; 6. To define features of technical and tactical training of billiard players with disorders of the musculoskeletal system.
Keywords	adaptive sports
	musculoskeletal disorders
	billiards
	wheelchair athletes
	Para-billiard
Language of correspondence	German
Financial administration	Another office (not recognised by the SNSF) which performs this fiduciary role

7. University or research institution

University	Eidgenössische Hochschule für Sport Magglingen - E
Remarks	

8. Collaboration (national and international)

9. Requested funding

Requested funding	Total (CHF)	Year 1	Year 2	Year 3	Year 4
Total (CHF)	**1'050'000**	**266'800**	**262'500**	**260'350**	**260'350**

Switzerland

Switzerland	**Total (CHF)**	**Year 1**	**Year 2**	**Year 3**	**Year 4**
Total (CHF)	**350'000**	**91'800**	**87'500**	**85'350**	**85'350**

Travel expenses	**Total (CHF)**	**Year 1**	**Year 2**	**Year 3**	**Year 4**
Travel costs	8'000	2'000	2'000	2'000	2'000
Total (CHF)	**8'000**	**2'000**	**2'000**	**2'000**	**2'000**
Total (%)	**1%**	**1%**	**1%**	**1%**	**1%**

Social security contributions	**Total (CHF)**	**Year 1**	**Year 2**	**Year 3**	**Year 4**
Social security contributions	44'800	11'200	11'200	11'200	11'200
Total (CHF)	**44'800**	**11'200**	**11'200**	**11'200**	**11'200**
Total (%)	**4%**	**4%**	**4%**	**4%**	**4%**

Salaries	**Total (CHF)**	**Year 1**	**Year 2**	**Year 3**	**Year 4**
Salary for further employees	280'000	70'000	70'000	70'000	70'000
Total (CHF)	**280'000**	**70'000**	**70'000**	**70'000**	**70'000**
Total (%)	**27%**	**26%**	**27%**	**27%**	**27%**

Equipment	**Total (CHF)**	**Year 1**	**Year 2**	**Year 3**	**Year 4**
Equipment	17'200	8'600	4'300	2'150	2'150
Total (CHF)	**17'200**	**8'600**	**4'300**	**2'150**	**2'150**
Total (%)	**2%**	**3%**	**2%**	**1%**	**1%**

Partner country 2

Partner country 2	**Total (CHF)**	**Year 1**	**Year 2**	**Year 3**	**Year 4**
Total (CHF)	**350'000**	**87'500**	**87'500**	**87'500**	**87'500**

Salaries	**Total (CHF)**	**Year 1**	**Year 2**	**Year 3**	**Year 4**
Salary for employees from Croatia - postoctoral researchers	59'000	14'750	14'750	14'750	14'750
Salary for employees from Croatia - doctoral students	37'580	9'395	9'395	9'395	9'395
Salary for employees from Croatia - further employees	59'000	14'750	14'750	14'750	14'750
Total (CHF)	**155'580**	**38'895**	**38'895**	**38'895**	**38'895**
Total (%)	**15%**	**15%**	**15%**	**15%**	**15%**

Equipment	**Total (CHF)**	**Year 1**	**Year 2**	**Year 3**	**Year 4**
Equipment costs Croatia	75'640	18'910	18'910	18'910	18'910
Total (CHF)	**75'640**	**18'910**	**18'910**	**18'910**	**18'910**
Total (%)	**7%**	**7%**	**7%**	**7%**	**7%**

Consumables and Maintenance	**Total (CHF)**	**Year 1**	**Year 2**	**Year 3**	**Year 4**
Consumables Croatia	25'640	6'410	6'410	6'410	6'410
Total (CHF)	**25'640**	**6'410**	**6'410**	**6'410**	**6'410**
Total (%)	**2%**	**2%**	**2%**	**2%**	**2%**

Travel expenses	Total (CHF)	Year 1	Year 2	Year 3	Year 4
Travel costs Croatia	75'640	18'910	18'910	18'910	18'910
Total (CHF)	**75'640**	**18'910**	**18'910**	**18'910**	**18'910**
Total (%)	**7%**	**7%**	**7%**	**7%**	**7%**

Other costs	Total (CHF)	Year 1	Year 2	Year 3	Year 4
Other direct costs Croatia (incl. Overhead)	17'500	4'375	4'375	4'375	4'375
Total (CHF)	**17'500**	**4'375**	**4'375**	**4'375**	**4'375**
Total (%)	**2%**	**2%**	**2%**	**2%**	**2%**

Partner country 4

Partner country 4	Total (CHF)	Year 1	Year 2	Year 3	Year 4
Total (CHF)	**350'000**	**87'500**	**87'500**	**87'500**	**87'500**

Salaries	Total (CHF)	Year 1	Year 2	Year 3	Year 4
Salary for employees from Romania - doctoral students	37'580	9'395	9'395	9'395	9'395
Salary for employees from Romania - further employees	59'000	14'750	14'750	14'750	14'750
The applicants' own salaries Romania	59'000	14'750	14'750	14'750	14'750
Total (CHF)	**155'580**	**38'895**	**38'895**	**38'895**	**38'895**
Total (%)	**15%**	**15%**	**15%**	**15%**	**15%**

Equipment	Total (CHF)	Year 1	Year 2	Year 3	Year 4
Equipment costs Romania	75'640	18'910	18'910	18'910	18'910
Total (CHF)	**75'640**	**18'910**	**18'910**	**18'910**	**18'910**
Total (%)	**7%**	**7%**	**7%**	**7%**	**7%**

Consumables and Maintenance	Total (CHF)	Year 1	Year 2	Year 3	Year 4
Consumables Romania	25'640	6'410	6'410	6'410	6'410
Total (CHF)	**25'640**	**6'410**	**6'410**	**6'410**	**6'410**
Total (%)	**2%**	**2%**	**2%**	**2%**	**2%**

Travel expenses	Total (CHF)	Year 1	Year 2	Year 3	Year 4
Travel costs Romania	75'640	18'910	18'910	18'910	18'910
Total (CHF)	**75'640**	**18'910**	**18'910**	**18'910**	**18'910**
Total (%)	**7%**	**7%**	**7%**	**7%**	**7%**

Other costs	Total (CHF)	Year 1	Year 2	Year 3	Year 4
Other direct costs Romania (incl. Overhead)	17'500	4'375	4'375	4'375	4'375
Total (CHF)	**17'500**	**4'375**	**4'375**	**4'375**	**4'375**
Total (%)	**2%**	**2%**	**2%**	**2%**	**2%**

Allocation by person/project

Person	Total (CHF)	Year 1	Year 2	Year 3	Year 4
Baic, Mario	350'000	87'500	87'500	87'500	87'500
	33%	33%	33%	34%	34%
Nagorna, Viktoriia	350'000	91'800	87'500	85'350	85'350
	33%	34%	33%	33%	33%
Potop, Vladimir	350'000	87'500	87'500	87'500	87'500
	33%	33%	33%	34%	34%
Total (CHF)	**1'050'000**	**266'800**	**262'500**	**260'350**	**260'350**

Details

Salary for further employees	Total (CHF)	Year 1	Year 2	Year 3	Year 4
implementer: Artur Mytko	280'000	70'000	70'000	70'000	70'000
Work-time percentage	Year 1: 80.00% | Year 2: 80.00% | Year 3: 80.00% | Year 4: 80.00%				
Social security contributions	Year 1: 16.00% | Year 2: 16.00% | Year 3: 16.00% | Year 4: 16.00%				
Comments / Additions	Project implementer from Switzerland - Dr. Artur Mytko Primary Role: Optimize the physical performance of Para-billiards athletes through biomechanical research. Tasks: Study the biomechanics of Para-billiards players' movements. Design and test adaptive equipment. Develop guidelines for safe and effective training practices. Milestones: Initial Biomechanics Study Report: Complete and disseminate a report detailing the initial findings of the biomechanics study. Prototype Adaptive Equipment: Design, test, and refine adaptive equipment for para-billiards athletes. Finalized Training Guidelines: Develop and publish comprehensive training guidelines based on biomechanical research.				
Person	Artur Mytko male / 15.07.1992 Number of children 3 / English / Ukraine				
Academic degree	Dr./PhD since 23.12.2021				
Relation to person/project	Nagorna, Viktoriia				
Total (CHF)	**280'000**	**70'000**	**70'000**	**70'000**	**70'000**
Total (%)	**27%**	**26%**	**27%**	**27%**	**27%**

Social security contributions	Total (CHF)	Year 1	Year 2	Year 3	Year 4
implementer: Artur Mytko	44'800	11'200	11'200	11'200	11'200
Total (CHF)	**44'800**	**11'200**	**11'200**	**11'200**	**11'200**
Total (%)	**4%**	**4%**	**4%**	**4%**	**4%**

Travel costs	Total (CHF)	Year 1	Year 2	Year 3	Year 4
Conferences, congresses, exhibitions, sport events	8'000	2'000	2'000	2'000	2'000
Comments / Additions	Travel expenses to international conferences, exhibitions, sport events for wheelchair users. Travel expenses for the experimental part of the research				
Relation to person/project	Nagorna, Viktoriia				
Total (CHF)	**8'000**	**2'000**	**2'000**	**2'000**	**2'000**
Total (%)	**1%**	**1%**	**1%**	**1%**	**1%**

Equipment	Total	Year 1	Year 2	Year 3	Year 4

		(CHF)				
Laptops, data storage, sensors and auxiliary equipment		17'200	8'600	4'300	2'150	2'150
Comments / Additions	Special equipment we will need for: Experimental Research: Controlled studies to assess the impact on psychophysiological health. Biomechanical Analysis: Using motion capture and analysis software to study player movements. Educational Program Development: Collaboration with education experts to develop and refine curricula.					
Relation to person/project	Nagorna, Viktoriia					
Total (CHF)		**17'200**	**8'600**	**4'300**	**2'150**	**2'150**
Total (%)		**2%**	**3%**	**2%**	**1%**	**1%**

Travel costs Croatia		**Total (CHF)**	**Year 1**	**Year 2**	**Year 3**	**Year 4**
Travel costs		75'640	18'910	18'910	18'910	18'910
Comments / Additions	Travel expenses to international conferences, exhibitions, special events. Travel expenses for inviting specialists for educational events. Travel expenses for the experimental part of the research.					
Relation to person/project	Baic, Mario					
Total (CHF)		**75'640**	**18'910**	**18'910**	**18'910**	**18'910**
Total (%)		**7%**	**7%**	**7%**	**7%**	**7%**

Consumables Croatia		**Total (CHF)**	**Year 1**	**Year 2**	**Year 3**	**Year 4**
Expenses for the conferences and the educational process by programs		25'640	6'410	6'410	6'410	6'410
Comments / Additions	Expenses for the conferences and the educational process by programs					
Relation to person/project	Baic, Mario					
Total (CHF)		**25'640**	**6'410**	**6'410**	**6'410**	**6'410**
Total (%)		**2%**	**2%**	**2%**	**2%**	**2%**

Equipment costs Croatia		**Total (CHF)**	**Year 1**	**Year 2**	**Year 3**	**Year 4**
Laptops, data storage, sensors and auxiliary equipment		75'640	18'910	18'910	18'910	18'910
Comments / Additions	Laptops, data storage, sensors and auxiliary equipment. The equipment, consumables & materials used in the framework. Publishing stuff					
Relation to person/project	Baic, Mario					
Total (CHF)		**75'640**	**18'910**	**18'910**	**18'910**	**18'910**
Total (%)		**7%**	**7%**	**7%**	**7%**	**7%**

Other direct costs Croatia (incl. Overhead)		**Total (CHF)**	**Year 1**	**Year 2**	**Year 3**	**Year 4**
other costs		17'500	4'375	4'375	4'375	4'375
Comments / Additions	Overhead costs CRO team (5% of CRO team budget)					
Relation to person/project	Baic, Mario					
Total (CHF)		**17'500**	**4'375**	**4'375**	**4'375**	**4'375**
Total (%)		**2%**	**2%**	**2%**	**2%**	**2%**

Salary for employees from Croatia - postoctoral	**Total**	**Year 1**	**Year 2**	**Year 3**	**Year 4**

researchers	(CHF)				
implementer: Damir Pekas	59'000	14'750	14'750	14'750	14'750
Work-time percentage	Year 1: 100.00% | Year 2: 100.00% | Year 3: 100.00% | Year 4: 100.00%				
Social security contributions	Year 1: 0.00% | Year 2: 0.00% | Year 3: 0.00% | Year 4: 0.00%				
Comments / Additions	Responsibilities: Conducting surveys, interviews, and data analysis to determine the current status of adaptive sports nationally. Preparing educational and training session programs for persons with musculoskeletal disorders.				
Person	Damir Pekas male / 13.05.1977 Croatia				
Academic degree	Dr./PhD				
Relation to person/project	Baic, Mario				
Total (CHF)	**59'000**	**14'750**	**14'750**	**14'750**	**14'750**
Total (%)	**6%**	**6%**	**6%**	**6%**	**6%**

Salary for employees from Croatia - doctoral students	Total (CHF)	Year 1	Year 2	Year 3	Year 4
implementer: n.n.	37'580	9'395	9'395	9'395	9'395
Work-time percentage	Year 1: 100.00% | Year 2: 100.00% | Year 3: 100.00% | Year 4: 100.00%				
Social security contributions	Year 1: 0.00% | Year 2: 0.00% | Year 3: 0.00% | Year 4: 0.00%				
Comments / Additions	Responsibilities: Conducting surveys, interviews, and data analysis to determine the current status of adaptive sports nationally. Preparing educational and training session programs for persons with musculoskeletal disorders.				
Relation to person/project	Baic, Mario				
Total (CHF)	**37'580**	**9'395**	**9'395**	**9'395**	**9'395**
Total (%)	**4%**	**4%**	**4%**	**4%**	**4%**

Salary for employees from Croatia - further employees	Total (CHF)	Year 1	Year 2	Year 3	Year 4
technical support, coaching: n.n.	59'000	14'750	14'750	14'750	14'750
Work-time percentage	Year 1: 100.00% | Year 2: 100.00% | Year 3: 100.00% | Year 4: 100.00%				
Social security contributions	Year 1: 0.00% | Year 2: 0.00% | Year 3: 0.00% | Year 4: 0.00%				
Comments / Additions	Technical and education staff at the research project, coaching				
Relation to person/project	Baic, Mario				
Total (CHF)	**59'000**	**14'750**	**14'750**	**14'750**	**14'750**
Total (%)	**6%**	**6%**	**6%**	**6%**	**6%**

Travel costs Romania	Total (CHF)	Year 1	Year 2	Year 3	Year 4
Travel costs	75'640	18'910	18'910	18'910	18'910
Comments / Additions	Travel expenses to international conferences, exhibitions, special events. Travel expenses for inviting specialists for educational events. Travel expenses for the experimental part of the research				
Relation to person/project	Potop, Vladimir				
Total (CHF)	**75'640**	**18'910**	**18'910**	**18'910**	**18'910**
Total (%)	**7%**	**7%**	**7%**	**7%**	**7%**

Consumables Romania	Total	Year 1	Year 2	Year 3	Year 4

		(CHF)				
consumables		25'640	6'410	6'410	6'410	6'410
Comments / Additions	Expenses for the conferences and sport events by programs					
Relation to person/project	Potop, Vladimir					
Total (CHF)		**25'640**	**6'410**	**6'410**	**6'410**	**6'410**
Total (%)		**2%**	**2%**	**2%**	**2%**	**2%**

Equipment costs Romania		**Total (CHF)**	**Year 1**	**Year 2**	**Year 3**	**Year 4**
Laptops, data storage, sensors and auxiliary equipment		75'640	18'910	18'910	18'910	18'910
Comments / Additions	Laptops, data storage, sensors and auxiliary equipment. The equipment, consumables & materials used in the framework					
Relation to person/project	Potop, Vladimir					
Total (CHF)		**75'640**	**18'910**	**18'910**	**18'910**	**18'910**
Total (%)		**7%**	**7%**	**7%**	**7%**	**7%**

Other direct costs Romania (incl. Overhead)		**Total (CHF)**	**Year 1**	**Year 2**	**Year 3**	**Year 4**
other costs		17'500	4'375	4'375	4'375	4'375
Comments / Additions	Overhead costs Romania team (5% of Romania team budget)					
Relation to person/project	Potop, Vladimir					
Total (CHF)		**17'500**	**4'375**	**4'375**	**4'375**	**4'375**
Total (%)		**2%**	**2%**	**2%**	**2%**	**2%**

Salary for employees from Romania - doctoral students		**Total (CHF)**	**Year 1**	**Year 2**	**Year 3**	**Year 4**
implementer: n.n.		37'580	9'395	9'395	9'395	9'395
Work-time percentage	Year 1: 100.00% | Year 2: 100.00% | Year 3: 100.00% | Year 4: 100.00%					
Social security contributions	Year 1: 0.00% | Year 2: 0.00% | Year 3: 0.00% | Year 4: 0.00%					
Comments / Additions	Implement pilot educational and training sessions in selected locations. Begin training of coaches and instructors using the developed program. Collect feedback and preliminary data on the effectiveness of the training sessions and coach education programs.					
Relation to person/project	Potop, Vladimir					
Total (CHF)		**37'580**	**9'395**	**9'395**	**9'395**	**9'395**
Total (%)		**4%**	**4%**	**4%**	**4%**	**4%**

Salary for employees from Romania - further employees		**Total (CHF)**	**Year 1**	**Year 2**	**Year 3**	**Year 4**
Performing field work, technical support: n.n.		59'000	14'750	14'750	14'750	14'750
Work-time percentage	Year 1: 100.00% | Year 2: 100.00% | Year 3: 100.00% | Year 4: 100.00%					
Social security contributions	Year 1: 0.00% | Year 2: 0.00% | Year 3: 0.00% | Year 4: 0.00%					
Comments / Additions	Performing field work, technical support, coaches, instructors` salary					
Relation to person/project	Potop, Vladimir					
Total (CHF)		**59'000**	**14'750**	**14'750**	**14'750**	**14'750**
Total (%)		**6%**	**6%**	**6%**	**6%**	**6%**

The applicants' own salaries Romania	**Total**	**Year 1**	**Year 2**	**Year 3**	**Year 4**

	(CHF)				
implementer, applicant: Vladimir Potop	59'000	14'750	14'750	14'750	14'750
Work-time percentage	Year 1: 100.00% | Year 2: 100.00% | Year 3: 100.00% | Year 4: 100.00%				
Social security contributions	Year 1: 0.00% | Year 2: 0.00% | Year 3: 0.00% | Year 4: 0.00%				
Comments / Additions	Professor Potop Vladimir, Faculty of Science, Physical Education and Informatics, Department of Physical Education and Sport, National University of Science and Technology Politehnica Bucharest Role: Project Coordination, National and International Liaison Responsibilities: Overall project supervision, communication with international partners (Switzerland and Croatia), and meeting project milestones. Conducting surveys, interviews, and data analysis to determine the current status of adaptive billiards nationally. Creating and validating educational programs for trainers, organizing special events for wheelchair users, and hosting master classes from world-leading coaches to integrate official programs into practice. Developing a strategy to get billiards included in the Paralympic Games, collaborating with Swiss and Croatian teams.				
Person	Vladimir Potop male / 31.07.1975 Romania				
Academic degree	Prof.				
Relation to person/project	Potop, Vladimir				
Total (CHF)	**59'000**	**14'750**	**14'750**	**14'750**	**14'750**
Total (%)	**6%**	**6%**	**6%**	**6%**	**6%**

10. Research requiring authorisation or notification

HRA-relevant and HRA-irrelevant research involving humans	No
Research on human embryonic stem cells	No
Research on animals	No
Research on GMO or pathogens	No

11. 3R – Replace, Reduce, Refine

Project does not involve any animal experiments	Yes
Project involves experiments with animals that fall under the Animal Welfare Act (vertebrates, cephalopods, crayfish) and takes account of the 3R	No
Project is a 3R research project focusing on "Replace"	No
Project is a 3R research project focusing on "Reduce"	No
Project is a 3R research project focusing on "Refine"	No
Project involves experiments with animals that do not fall under the Animal Welfare Act (insects, worms)	No

12. Access and Benefit Sharing (ABS)

The research project plans to use genetic resources that are governed by the ABS provisions of the Nagoya Protocol	No

13. Fellowships for a research stay abroad

Project involves experiments that require authorisation and notification. I hereby confirm compliance with Swiss laws and ethical guidelines.	Yes
Authorisation by the host institute	not necessary
Type of authorisation	signature

14. Awareness of the relevant regulations

Relevant regulations noted and accepted	Yes

15. General remarks on the project

Subject	
Communication	
Confidential	No

Strategy for the Development of Billiards as an Adaptive Sport (Para-billiards) Globally

1. Summary of the Research Plan

Background. The concept of adaptive sports, a powerful tool for social integration, has yet to embrace the potential of Para-billiards fully. Unlike other adaptive sports, Para-billiards, which include various cue sports like pool, snooker, and carom, offer a unique blend of strategy, precision, and camaraderie. This rich history and significant cultural presence worldwide make it a compelling choice for athletes with disabilities. However, its adaptation as a sport for these individuals still needs to be developed. This strategy aims to explore and promote the development of Para-billiards as an adaptive sport globally, enhancing inclusivity and providing competitive opportunities while preserving the heritage and spirit of the game.

Our research aims to increase the integration of persons with musculoskeletal disorders into sports activities such as billiards by implementing innovative strategies and developments in the inclusive training and competitive process.

To achieve the primary goal of our project, we plan to accomplish the following tasks:

1. Determine the most objective state of adaptive billiards at the international level;

2. To substantiate strategy for the development of billiards as an adaptive sport (Para-billiards) globally;

3. To prepare the official programs of educational and training sessions in billiards (pool) for persons with disorders of the musculoskeletal system;

4. To develop the official education programs for trainers who coach athletes with inclusions (adaptive billiards for example);

5. To define the level of influence of billiards training on the psycho-physiological condition of persons with disorders of a musculoskeletal system;

6. To define features of technical and tactical training of billiard players with disorders of the musculoskeletal system.

Keywords: adaptive sports, musculoskeletal disorders, billiards, wheelchair athletes, Para-billiard

2. Research Plan

2.1. Current State of Research in the Field

Despite the recognition by international organizations of the importance of involvement in sports, the problem of inclusion remains relevant and needs to be fully resolved. There are still barriers that prevent specific individuals and groups from participating in sports, such as discrimination, lack of accessibility, and limited resources. Examples of groups that face challenges in participation in sports include people with disabilities, women and girls, and marginalized communities. Efforts to address this issue involve promoting policies and programs that increase access and opportunities for underrepresented groups and raising awareness of the importance of inclusion in sports.

World recognition of the importance of inclusion has contributed to increased attention from scientists and led to numerous studies in this field. As a result, a question has arisen about the need to conduct a scientometric analysis to review the current research in the field of inclusion in sports.

A specialized questionnaire commissioned by the Swedish Billiards Federation was conducted regarding inclusion in billiards. The survey was distributed to all 40 national federations (NFs) that are members of the European Pocket Billiard Federation (EPBF), except for two temporarily suspended NFs (BLR and RUS). Of the 38 NFs that responded to the survey, 25 NFs participated: Austria, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, Germany, Great Britain, Iceland, Italy, Lithuania, Netherlands, Macedonia, North Cyprus, Norway, Poland, Portugal, Slovenia, Serbia, Spain, Sweden, Switzerland, Turkey, and Ukraine.

According to the responses, 13 NFs know only one national sports organization dedicated explicitly to parasports, the National Paralympic Committee (NPC). Twelve 12 NFs were aware of two or more national sports organizations specializing in para-sports in their respective countries, seven NFs received support for their Para-billiards activities from one or more national parasport organizations, and one NF organized Para-billiards activities received support solely based on eventual international championship medals. In contrast, five NFs that organized Para-billiards activities received no support. Twelve NFs did not have dedicated activities within Para-billiards but had practitioners with disabilities who were integrated into general activities without receiving support from Para-billiards.

Regarding activities for athletes with disabilities, the responses were as follows:

- Yes, in carom (2 NFs);
- Yes, in pool (13 NFs);
- Yes, in snooker (3 NFs);
- Maybe, but not that we are aware of (2 NFs);
- No (10 NFs).

Concerning the number of athletes with disabilities who regularly participated in federation activities,

- Two NFs did not know how many practitioners with disabilities participated in federation activities;
- Not all athletes with disabilities were known, and dedicated activities for Para-billiards were not organized;
- The other 11 NFs estimated that they had approximately 700 practitioners divided together into 1-3 divisions.

Regarding the development of technical utilities/appliances, the responses were as follows:

- Yes (3 NFs);
- No, we use already existing utilities/appliances (6 NFs);
- No, we are unaware of any technical utilities/appliances (16 NFs).

Regarding competition activities for para-athletes, the following responses were given:

- 13 NFs integrated para-athletes into their regular competition activities;
- 8 NFs organized separate competitions for para-athletes, and three NFs previously had such competitions;

- 5 NFs planned to introduce separate competitions for para-athletes;
- 9 NFs did not have any competitions for para-athletes.

About participation in national or international championships,

- 15 NFs had para-athletes who participated in national championships, separately or through participation in integrated competitions;
- 12 NFs participated with para-athletes in international championships, all organized separately and in addition to championships for able-bodied athletes. It was not unusual for the championships to be arranged in the same arena.

The evident interest in this theme necessitates further investigation. Billiards has become one of the means of adaptive sports for a large group of people with injuries of the musculoskeletal system worldwide, creating conditions to meet their needs as self-realized members of society and realizing their capabilities in competitive activities. However, there are objective difficulties in training billiard athletes with musculoskeletal disorders. Athletes with spinal cord injuries who have different ranges of motion may find it difficult or even impossible to perform all kinds of shots technically. To improve the effectiveness of competitive activities, it is necessary to improve the training program to optimize techniques, special aids, and equipment for athletes in billiards with musculoskeletal disorders.

Analysis of the results obtained by many scientists on the problems of adaptive sports (Goodwin, B.M.; Cain, S.M.; Van Straaten, M.G.; Fortune, E.; Jahanian, O.; Morrow, M.M.B. Humeral.; de Vries, W.H.K.; Amrein, S.; Arnet, U.; Mayrhuber, L.; Ehrmann, C.; Veeger, H.E.J.; Matveev S., Briskin Y., Kohut I.; Fortune, E.; Cloud-Biebl, B.A.; Madansingh, S.I.; Ngufor, C.G.; Van Straaten, M.G.; Goodwin, B.M.; Murphree, D.H.; Zhao, K.D.; Morrow, M.M. and others) suggests that this issue has been quite actively researched in recent years, particularly in the areas of the regulatory and legal support of educational and training and competitive activities; load and rest management; pharmacological support of athletes with disabilities; nontraditional means and methods of recovery; socialization and communicative activities; and technical and design training as a new type of sports training. More attention should be given to the issue of improving software and material support to improve the competitive performance of athletes with musculoskeletal disorders.

The modern movement for adaptive sports began in the mid-20th century, gaining momentum with the establishment of the Paralympic Games in 1960. These Games provided a platform for athletes with disabilities to compete internationally. Since then, the range and popularity of adaptive sports have expanded significantly. However, despite its potential, Para-billiards has yet to achieve the same level of recognition or integration into major international adaptive sports frameworks. For example, the pool didn’t get a sport to have a place in the Paralympic Games program yet. Snooker featured in the Paralympic Games right from the beginning, at the 1960 Paralympics in Rome. It was included in the program for the next 28 years, excluding the 1980 games. In 1988, the sport took place in Seoul for the last time. To this day, it is unknown why exactly the sport was dropped. Many suggest that snooker is not an athletic sport, so it has been removed (https://www.topendsports.com/events/paralympics/sports/snooker.htm).

For a sport to have a place in the Paralympic Games program, it must meet criteria set by the International Paralympic Committee (IPC). Here are some key factors that determine if a sport can be included:

Governance and rules:

The sport must be governed by an International Paralympic Sport Federation (IPSF) with established rules, regulations, and competition structures. The IPSF needs to be recognized by the IPC and follow the IPC's rules and regulations.

Global participation:

The sport must have a significant global participation and be practiced in many countries across multiple continents. This ensures a diverse and competitive field of athletes at the Paralympic Games.

Classification system:

The sport must have a well-defined and fair classification system that groups athletes based on their functional abilities and impairments. This ensures a level playing field and equal opportunities for athletes with different disabilities.

Anti-doping compliance:

The IPSF and athletes must comply with the World Anti-Doping Code and the IPC's anti-doping policies. This maintains the integrity and fairness of the sport.

Athlete development:

The sport should have a clear pathway for athlete development, from grassroots to elite levels, with opportunities for training, coaching, and competition at various levels.

Spectator appeal and media coverage:

The sport should have the potential to attract spectators, media coverage, and sponsors, contributing to the overall success and promotion of the Paralympic Games.

IPC evaluation and approval:

The IPC evaluates and approves sports for inclusion in the Paralympic Games based on the above criteria factors, such as cost, venue requirements, and alignment with the Paralympic values and vision.

Sports that meet these criteria and are approved by the IPC can be included in the Paralympic Games program. The IPC regularly reviews and updates the sports program to ensure it remains relevant, inclusive, and aligned with the evolving needs and interests of athletes and spectators.

Billiards offers several unique benefits as an adaptive sport. It requires precision, strategy, and mental acuity to provide a competitive and engaging environment for individuals with various physical disabilities. The sport can be adapted for athletes with mobility, vision, and other disabilities, making it accessible to many participants. Moreover, billiards' relatively low physical strain allows for a focus on skill development and strategy, making it a viable option for athletes who cannot participate in more physically demanding sports.

Given the sociopolitical situation in the world, adaptive sports are one of the primary ways of solving urgent problems for persons with disabilities: overcoming a lack of confidence in their abilities and victory over their "inferiority," as well as achieving maximum sports results and demonstrating the highest human capabilities at national and international competitions.

The most popular sports for athletes with disabilities are table tennis, volleyball, basketball, badminton, billiards, weightlifting, swimming, shooting, chess, checkers, and football. However, billiard players with different range-of-motion capabilities due to spinal cord injury require an individual approach that involves the development of individual training programs and modernizing sports equipment. Injuries to the spinal column in the area of the 5th and 6th cervical vertebrae can have profound implications for an individual's neurological function and overall well-being. The following are some key provisions regarding injuries in this region.

The analysis of specialized and scientific literature, expert surveys, and pedagogical observations confirmed the need for objective assessment of athletes' condition during training and competitive processes and enabling adjustments to training tasks for individualization. Expert surveys and biomechanical analysis of athletes' movements during the execution of technical maneuvers require the development of special equipment for billiard players with musculoskeletal impairments. The research findings facilitated the formulation of individualized training plans for these players by implementing innovative technologies and inclusive strategies.

2.2. Current State of Our Research and Partnership Aspects

Given the current state of our society, it is imperative to prioritize the needs of individuals facing more significant challenges, such as persons with musculoskeletal disabilities. The variety and versatility of physical exercises in sports activities enable a wide range of positive effects on the psychosocial and physical well-being of individuals with different kinds of disabilities [1]. Scientific literature highlights the prevalence of musculoskeletal impairments, given that they are among the most common conditions. For instance, in the Summer Paralympic Games program, 83% of the competitions are dedicated to athletes with musculoskeletal impairments [1, 2].

The analysis of contemporary literature and advanced experiences reveals that many countries are exploring new avenues of social rehabilitation for individuals with disabilities through sports [3-7]. Special centers for sports rehabilitation provide them with opportunities to engage in various forms of physical activities under careful medical, biological, pedagogical, and psychological supervision, utilizing the latest scientific research on the impact of rehabilitative sports on their health and functionality [6-11].

An analysis of the current state of the problem highlights the necessity of intensifying the preparation process for these pool players for major international competitions through individualization and optimization of training programs. Additionally, developing innovative technologies that enable the use of the players' entire technical-tactical arsenal is crucial, as billiards require the precise differentiation of striking force and movement accuracy for the successful execution of its 60 different strokes [12, 13].

Billiards players with musculoskeletal impairments often face objective challenges in controlling the force and accuracy of their strikes. Accuracy in billiards depends on several parameters: the differentiation of movement amplitude, the force applied to the strike, and the determination of the distance to the target aiming point. Therefore, developing specific equipment to compensate for the inability to execute specific technical maneuvers is a reasonable measure. Additionally, precise alignment of training and competitive loads with the individual capabilities of the athlete is necessary.

The Sociological Survey in our study served as a comprehensive method for gathering information on the state of adaptive billiards development in European countries. This involved direct and indirect communication channels, including oral interviews and written questionnaires. The participants in this survey comprised representatives from each member country of the European Pocket Billiard Federation (EPBF), as well as coaches and officials from nations actively involved in the European Pool Championship from 2017 to 2022.

The survey reached 37 national federations affiliated with the EPBF, with responses obtained from 20 of them providing extensive insights into the landscape of adaptive billiards within their respective countries. The findings revealed a notable interest among individuals with various disabilities in billiards. However, challenges were identified, indicating that federations or billiard clubs often struggle to offer favorable conditions for training and competitive participation for this demographic.

A comprehensive list of primary challenges impeding the development of adaptive billiards was extrapolated from respondents' answers in 2023 to analyze the survey data systematically. These challenges were subsequently categorized into six main reasons contributing to the observed low activity levels among individuals with disabilities in adaptive billiards. Subsequently, these identified factors were incorporated into a Matrix of experts' assessments involving 20 experts. This matrix facilitated the determination of the most critical elements negatively influencing the integration of people with musculoskeletal disorders into the sports realm, providing valuable insights for further investigation and intervention strategies.

To ascertain the collective expert opinion on prevalent issues in adaptive billiards (refer to Table 1) impeding the effective progression of pool training and competitive performance for wheelchair users, a meticulous analysis of expert assessments was conducted. To facilitate this analysis, a matrix delineating the ratings of ranked factors by each expert was devised (refer to Table 2). Within this matrix, experts identified and ranked the tools they deemed most significant for adverse manifestations in adaptive billiards. The ranking was structured in descending order of influence, with experts assigning positions from 1 to 6 based on their perceived impact.

Table 1: Numbering of experts' factors

Name of factor	Factor number (n)
Billiard halls/clubs do not have special entrances for people using wheelchairs	1
Billiard halls/clubs are not equipped with special equipment and inventory for people who use wheelchairs	2
Billiard specialists/coaches working with people with musculoskeletal disorders are lacking in the region.	3
Special scientific and methodological literature has not been published for building a training process in billiards for persons with musculoskeletal disorders.	4
Lack of interest of national federations in the development of adaptive billiards in the country	5
Low level of awareness of persons with musculoskeletal disorders regarding adaptive billiards	6

Table 2: Matrix of experts' assessments

Expert number (m)	Factor number (n)						x_i
	1	**2**	**3**	**4**	**5**	**6**	
1.	2	1	3	4	6	5	21
2.	4	2	1	6	5	3	21
3.	1	3	4	5	6	2	21
4.	4	1	3	2	6	5	21
5.	1	2	3	4	6	5	21
6.	4	2	1	5	6	3	21
7.	3	2	1	5	6	4	21
8.	2	1	3	4	6	5	21
9.	1	6	5	3	2	4	21
10.	2	3	1	4	6	5	21
11.	1	3	2	4	6	5	21
12.	4	1	3	2	6	5	21
13.	1	2	3	5	6	4	21
14.	4	1	3	2	6	5	21
15.	1	2	4	3	6	5	21
16.	3	1	4	2	6	5	21
17.	4	2	1	3	6	5	21
18.	2	5	4	3	6	1	21
19.	1	3	4	2	6	5	21
20.	2	1	3	4	6	5	21
x_j	47	44	56	72	115	86	420
K_j	0,24*	0,25*	0,21*	0,16	0,02	0,11	0,17
W							0,71

* - the factor is significant, as the value of the coefficient significance is equal to or exceeds the value of the normative coefficient ($K_j \geq 0{,}17$), because of the normative coefficient of significance $K_N = 0{,}17$.

Pedagogical observation, which included the analysis of the technical actions of highly skilled billiard players from Europe and the top-ranked Ukrainian athletes with musculoskeletal impairments, involving a total of 23 athletes, was conducted by us to obtain information on model characteristics of the main stroke techniques for wheelchair pool players.

The pedagogical observation method identified two primary techniques wheelchair-user players employ in executing a basic billiard shot. Following this, a biomechanical analysis of these two techniques was conducted using the

innovative "OpenCap" development [15]. For biomechanical analyses using OpenCap (opensimModel: LaiArnoldModified2017_poly_withArms_weldHand, posemodel: openpose, augmentermodel: v0.2), the system utilized paired cameras from two iOS devices connected to a web application operating on a standard laptop, which recorded videos at a rate of 60Hz.

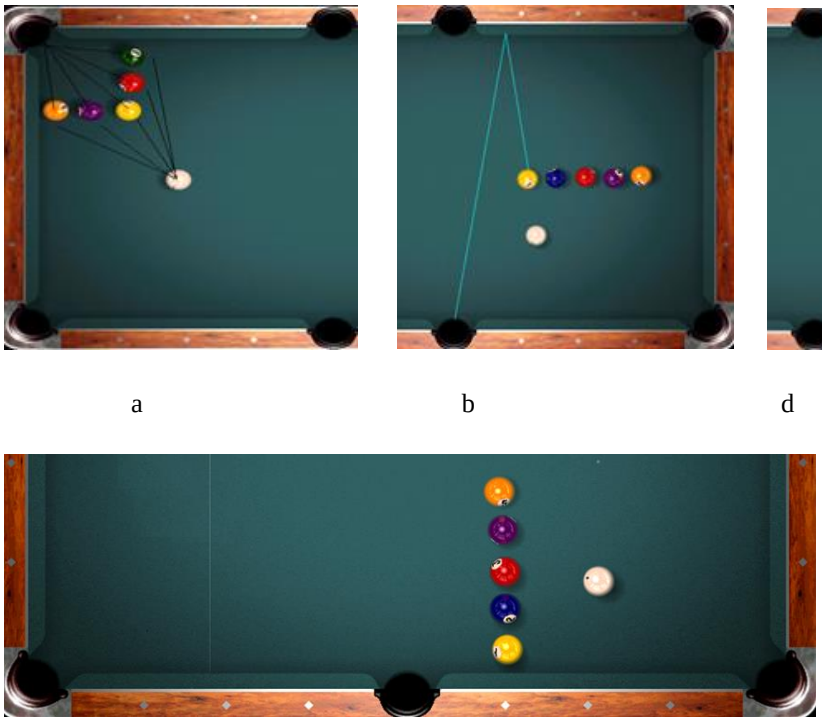
Pedagogical testing was conducted to determine the technical-tactical and specific physical preparedness levels of 16 billiard players with various musculoskeletal impairments. The tests encompassed a series of technical and tactical exercises (Figure 1):

Basic shots without cue ball positioning for the next ball – “cue-ball on the spot” for each shot (a) – max 15 points for one exercise, 1 pocketed object ball gives 3 points;

difficult shots, like bank shots, without cue ball positioning for the next ball – “cue-ball in hand” for each shot (b) – max 15 points for one exercise, 1 pocketed object ball gives 3 points;

basic shots with cue ball positioning in a specific area (c). The exercise involves executing basic shots with cue ball positioning in three specific table areas, consisting of 5 follow shots, 5 stop shots, and 5 draw shots. Each exercise has a maximum score of 15 points. One point is awarded for each pocketed object ball made with follow, stop, or draw shots, depending on the aim of the cue ball position;

performing difficult shots involving cue ball positioning to reach the next object ball, such as in the "Replacement Line" exercise (d), where the cue ball is initially placed "in hand" for the first shot but subsequently played from its stopping position after pocketing an object ball. The objective is to pocket all object balls without touching others until a miss occurs, with a maximum score of 15 points, where each ball pocketed earns 3 points.



a b d

c

Figure 1: The pedagogical tests for billiard players with various types of musculoskeletal impairments (n=16) consist of technical and tactical exercises: basic shots without cue ball positioning for the next ball (a), difficult shots without cue ball positioning for the next (b), basic shots with cue ball positioning in a specific area (c), difficult shots involving cue ball positioning to the next object ball (d)

Following the logic of defining a similar indicator in other sports, the special physical preparedness of a billiard player encompassed values that corresponded to the combination of technical and tactical preparedness and individual game performance.

In the context of the medical background of musculoskeletal disorders observed in a group of 10 athletes from the national wheelchair pool team who participated in our experimental study (using a modified "mechanical bridge" and special straps for cue fixation during the stroke), a diagnosis of spinal cord injury at the C5-C6 level was established. The individuals exhibited complete immobility of the fingers and functional extensor activity in the wrist, but they could not perform flexion movements.

Biomechanical analysis of two distinct billiard stroke techniques for wheelchair-user players was conducted using innovative modern approaches, such as OpenCap (Figure 2). For OpenCap (opensimModel: LaiArnoldModified2017_poly_withArms_weldHand, posemodel: openpose, augmentermodel: v0.2), the setup involved synchronizing cameras from two iOS devices with a web application running on a standard laptop, capturing videos at a rate of 60Hz. The OpenCap methodology involves several steps for estimating movement dynamics from videos, including camera calibration, video collection and processing, marker position estimation, kinematics estimation, and the generation of physics-based dynamic simulations of movements. This comprehensive pipeline is implemented in Python (v3.7.10), and the OpenCap web application provides a user-friendly interface, guiding users through each step. Cloud instances are utilized for the computational processes.

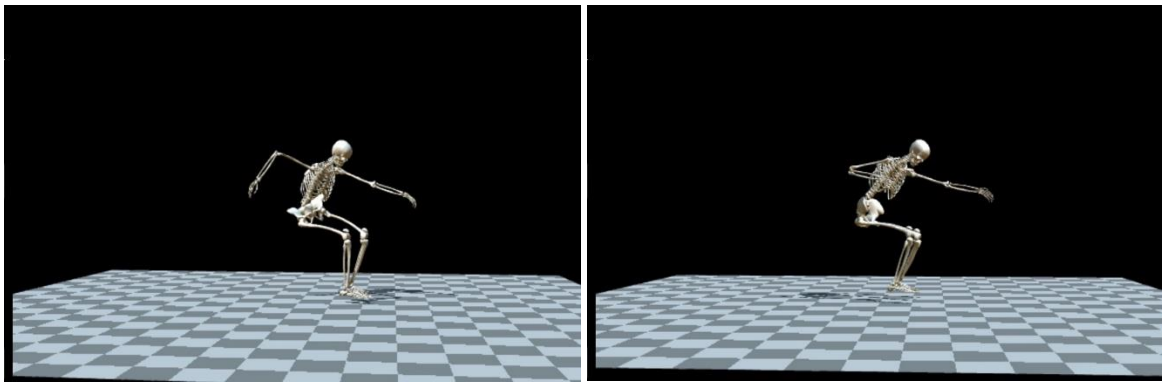


Figure 2: Biomechanical analysis of wheelchair-user players' billiard stroke techniques using the innovative “OpenCap” development

Statistical Analysis

The level of specialized physical preparedness was calculated using the formula:

$$SPhP = \frac{\sum B_{player}^{1-4} \cdot 100}{\sum B_{max}^{1-4}} \quad (1)$$

where ∑B1-4_player is the sum of points for 4 test exercises performed by wheelchair users pool players, and ∑B1-4_max is the maximum possible sum of points for 4 test exercises to determine the level of specialized physical preparedness.

The formula for calculating the effectiveness of competitive performance was as follows:

$$R_{new} = R1 \geq R2 \Rightarrow R_1 + M \cdot V \cdot 25 \left(\frac{R1}{R2}\right)^{-1.7} R1 \leq R2 \Rightarrow R_1 + M \cdot V \cdot \left(25 - 9ln\left(\frac{R1}{R2}\right)\right) \quad (2)$$

where $M = \frac{\sum R^{1-16} tournament}{\sum R^{1-16} rating}$; $V = \frac{S_1 - S_2}{\sqrt{5 \cdot max(S_1; S_2)}}$ (3)

R_1 and R_2 are the players' ratings;

M is the tournament coefficient (the ratio of the sum of points of the top 16 players in the tournament to the sum of points of the top 16 players in the rating); the minimum value is 0.5;

V is the significance of victory; S_1, S_2 are the number of wins by the 1st and 2nd players in the match;

max (S_1, S_2) is the match format (the number of wins required); the larger the format, the more points are at stake.

The formula was modified for billiards by Mytko [14].

During the statistical processing of the research, the evaluation of the effectiveness of the competitive activity was carried out according to the indicator of the probability of events. That is, according to the theory of probability, we determined the possibilities of effective performance of specific types of shots in billiards when using the innovative aids developed by us for people with injuries of the musculoskeletal system [16].

The degree of agreement between experts' answers was determined using Kendall's concordance coefficient (W). Kendall's concordance coefficient was calculated using the formula:

$$W = \frac{12 \cdot S}{m^2(n^3 - n)} \quad (4)$$

where S - is the sum of the squares of the deviation of the estimate from the mean value:

$$S = \sum_{i=1}^{n} \left(\left(\sum_{j=1}^{m} x_{ij} \right) - \bar{x} \right)^2 \quad (5)$$

where m - is the number of experts; n – is the number of examination objects; x_{ij} – i-th evaluation of the j-th expert;

$\bar{x}$ - is the average score given by m experts for all n objects of examination, which is determined by the formula:

$$\bar{x} = \frac{m \cdot (n+1)}{2} \quad (6)$$

m - is the number of experts; n - is the number of examination objects.

The coefficient of significance of each factor established as a whole by the group of experts is determined by the formula:

$$K_j = \frac{m \cdot n - x_j}{0{,}5 \cdot m \cdot n \cdot (n-1)} \quad (7)$$

Determination of the normative coefficient of significance (K_N), which is the reciprocal of the number of ranked factors:

$$K_N = \frac{1}{n} \quad (8)$$

Respondents' answers to the questions in the questionnaires were determined by points, which provided an assessment of the probability of the obtained results using non-parametric statistical methods. Then, we used the Mann-Whitney U-test, the statistical significance of which was checked using the χ^2 test.

Results

The literature review [17-21] encompasses diverse studies on physical activity and mobility in various populations, emphasizing individuals with spinal cord injuries and manual wheelchair users. These studies cover topics such as the humeral elevation workspace during daily life in adults with spinal cord injury who utilize manual wheelchairs, comparing them to age and sex-matched able-bodied controls. Additionally, the review explores using a neural network model with inertial body-worn sensors to estimate manual wheelchair-based activities in free-living environments. The broader

perspective of public health and physical activity is also considered, highlighting the role of legislative and policy initiatives in increasing physical activity levels, with potential implications for individuals with disabilities. Lastly, the discussion extends to the concept of inclusion in sports, particularly addressing disability and tournament participation. This diverse set of studies collectively contributes to understanding physical activity, mobility, and inclusive practices in sports and exercise contexts. The insights provided are valuable for wheelchair users and their coaches. Combined with expert surveys (conducted among 37 representatives from European countries, with 20 specialists selected for expert evaluation), they confirm the need for an objective assessment of athletes' conditions during training and competitive processes. This enables adjustments to training tasks for individualization, emphasizing the importance of special equipment and inventory for wheelchair users (Figure 3).

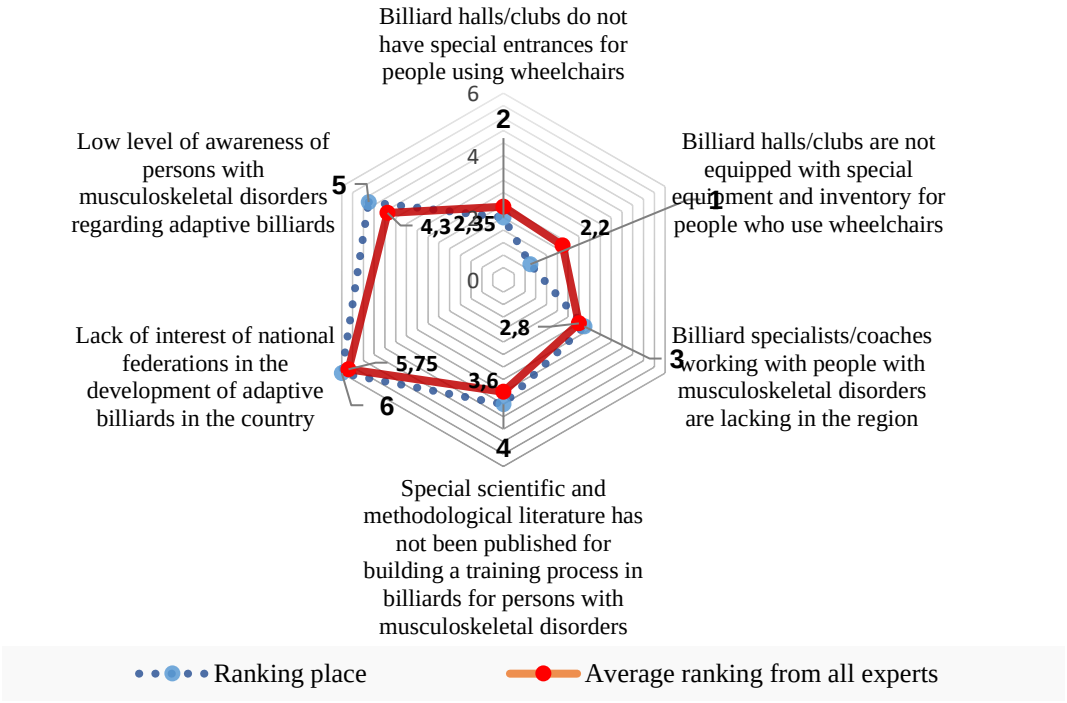
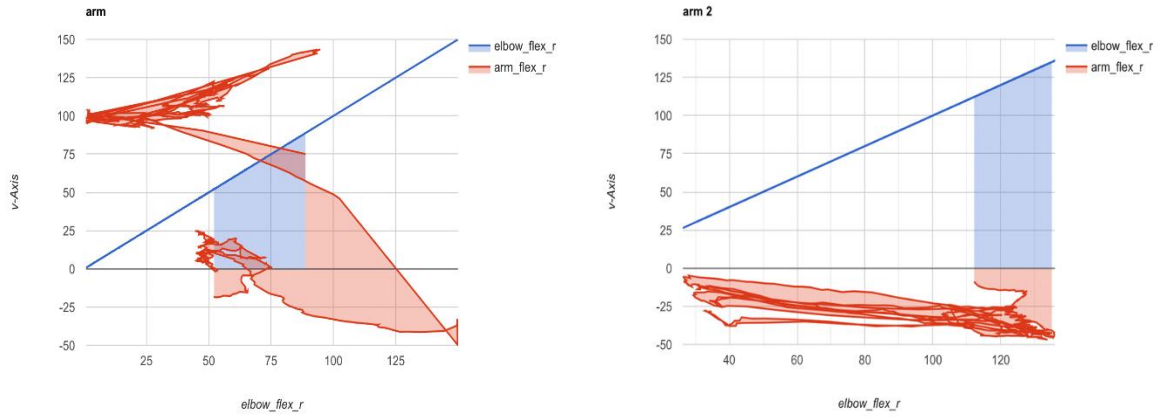


Figure 3: Analysis of expert (m=20) assessments on prevalent issues in adaptive billiards impeding the effective progression of pool training and competitive performance for wheelchair users

To record the kinematic parameters of motor actions during the execution of the same type of billiard shot but using two different techniques, the OpenCap application was employed, focusing on joints with one degree of freedom, such as the shoulder and elbow of the player's dominant hand. The trajectory of the point relative to the external coordinate system was constructed, namely, the kinematic diagram of two motor actions - the player's stroke arm in the "vertical" and "horizontal" shot techniques. Anatomical marker positions were estimated from the recorded videos to compute joint kinematics using OpenSim's Inverse Kinematics tool and the scaled musculoskeletal model. The resulting 3D kinematics were visualized in the web application. We determined a reasonably close correlation (r=0.98) between indicators of straight-line motion of the cue during a shot by a billiards player using two different techniques (p value = 0.01): with the forearm in the vertical plane and with the forearm in the horizontal plane (Figure 4).



a b

Figure 4: The kinematic diagram of two motor actions - the player's stroke arm in the "vertical" (a) and "horizontal" (b) shot techniques for wheelchair users

Pedagogical observations and testing of technical preparedness indicators before the implementation of the experiment yielded the following results: basic shots without cue ball positioning for next shot were executed successfully by 100% of the athletes, while difficult shots without cue ball positioning for the next shot were executed successfully by 85% of the athletes; basic shots with cue ball positioning were executed successfully by 87.5% of the athletes, and difficult shots with cue ball positioning for the next object ball were executed successfully by only 56.25% of the athletes.

The low percentage distribution in the effectiveness of difficult shots, which involve cue ball positioning for the next object ball, performed by athletes, is understandable. In a game situation, tactics may necessitate positioning the cue ball at a location on the table, which would be inconvenient for a player who uses a wheelchair to execute a shot.

The level of specialized physical preparedness was calculated using the formula we modified specifically for billiards. We obtained an average coefficient of specialized physical preparedness level for wheelchair users who are pool players, denoted as SPhP=28±4.42. Furthermore, the specialized formula for billiards was applied to compute the coefficient of effectiveness of competitive performance at national and international levels, yielding R_{new}=20±8.21.

The scientific and applied relevance of the innovations developed to enhance the effectiveness of the national team's training and competitive activities in adaptive billiards (pool) has been proven. These developments can be applied to other forms of adaptive sports nationally and worldwide.

2.3. Detailed research plan

Our project aims to increase the integration of persons with musculoskeletal disorders into sports activities, specifically billiards, through innovative strategies in inclusive training and competition. We have outlined the following specific tasks to achieve this goal over four years:

1. Determine the most objective state of adaptive billiards at the international level;

2. To substantiate strategy for the development of billiards as an adaptive sport (Para-billiards) globally;

3. To prepare the official programs of educational and training sessions in billiards (pool) for persons with disorders of the musculoskeletal system;

4. To develop the official education programs for trainers who coach athletes with inclusions (adaptive billiards for example);

5. To define the level of influence of billiards training on the psycho-physiological condition of persons with disorders of a musculoskeletal system;

6. To define features of technical and tactical training of billiard players with disorders of the musculoskeletal system.

Specific Investigations and Experiments

1. Determine the Objective State of Development of Adaptive Billiards

Investigations:

- Conduct a comprehensive literature review on adaptive sports and current practices in adaptive billiards.
- Survey existing adaptive billiards programs worldwide.
- Interview stakeholders (coaches, athletes, sports organizations) to gather qualitative data.

Risk: Limited availability of data on adaptive billiards.

Alternative: Broaden the scope to include related adaptive sports for comparative analysis.

2. Develop a Strategy Plan for the Development of Adaptive Billiards

Investigations:

- Analyze the collected data to identify gaps and opportunities.
- Develop strategic goals and actions tailored to different national contexts.
- Engage with national sports federations for feedback and validation.

Risk: Resistance from traditional sports federations.

Alternative: Highlight successful case studies and potential benefits to encourage buy-in.

3. Prepare Official Programs of Educational and Training Sessions

Investigations:

- Collaborate with educational experts to develop a curriculum.
- Pilot the program with a small group of participants and refine it based on feedback.
- Ensure the curriculum addresses both physical and psychological aspects of training.

Risk: Low participation rates in pilot programs.

Alternative: Partner with rehabilitation centers and adaptive sports clubs to increase participation.

4. Substantiate Official Education Programs for Trainers

Investigations:

- Develop a comprehensive training manual for coaches.
- Organize workshops and certification programs.
- Evaluate the effectiveness of the training programs through feedback and performance assessments.

Risk: Limited interest from coaches in specialized training.

Alternative: Offer incentives and highlight the career benefits of specialization in adaptive sports.

5. Define the Level of Influence of Billiards on Psychophysiological Condition

Investigations:

- Conduct controlled experiments to assess the impact of billiards on physical and psychological health.
- Use standardized psychophysiological assessment tools to measure outcomes.
- Compare results with a control group engaged in non-sport activities.

Risk: Difficulty in maintaining participant engagement over time.

Alternative: Provide continuous support and adapt sessions to keep participants motivated.

6. Define Features of Technical and Tactical Training

Investigations:

- Conduct biomechanical studies to analyze the movements of adaptive billiards players.

- Develop tailored training techniques based on these analyses.
- Test and refine these techniques through iterative feedback from athletes and coaches.

Risk: Variability in physical abilities among participants.

Alternative: Create flexible training modules that can be customized to individual needs.

7. Develop a Strategy for Including Billiards in the Paralympic Games

Investigations:

- Review criteria and processes for sports inclusion in the Paralympic Games.
- Develop a comprehensive advocacy plan, including stakeholder engagement and promotional activities.
- Present the case to relevant sports governing bodies and Paralympic committees.

Risk: Lengthy and complex approval process.

Alternative: Build a strong coalition of support from international adaptive sports organizations to strengthen the case.

Data Collection Strategy

Existing Sources and Datasets:

Literature on adaptive sports and rehabilitation.

Survey data from existing adaptive billiards programs.

Psychophysiological assessment tools and databases.

Data Collection Methods:

Surveys and interviews with stakeholders.

Controlled experiments and longitudinal studies.

Biomechanical analysis using motion capture technology.

Psychophysiological assessments using standardized tools.

Alternative Strategies:

If direct data collection is challenging, collaborate with existing adaptive sports research networks to access their data.

Utilize online platforms for surveys and virtual interviews to reach a wider audience.

Research Methods and Collaboration

Methods to Reach Research Goals:

Literature Review and Meta-Analysis: To establish the current state and gaps in adaptive billiards.

Qualitative Research: Surveys and interviews to gather insights from stakeholders.

Experimental Research: Controlled studies to assess the impact on psychophysiological health.

Biomechanical Analysis: Using motion capture and analysis software to study player movements.

Educational Program Development: Collaboration with education experts to develop and refine curricula.

Necessity and Benefit of Collaboration:

Diverse Expertise: Combining expertise in psychophysiology, biomechanics, and education ensures a holistic approach.

Cross-Border Insights: Collaboration with multiple countries provides a broader perspective and increases the robustness of the research.

Resource Sharing: Sharing resources and data across countries enhances the quality and scope of the research.

This detailed research plan outlines a comprehensive approach to developing billiards as an adaptive sport for individuals with musculoskeletal disorders. Through a combination of literature review, qualitative and quantitative research, and international collaboration, we aim to achieve significant advancements in the inclusivity and recognition of para-billiards globally. The collaboration among experts from Switzerland, Croatia, and Romania is essential for the success of this project, leveraging diverse expertise and resources to achieve our ambitious goals.

2.4. Schedule and Milestones

Funding: Each team in each participating country (Switzerland, Croatia, and Romania) plans for financial funds of 350,000 Swiss francs over four years.

Project Team and Roles

Applicant from Switzerland: Dr. Viktoriia Nagorna

Roles and Responsibilities:

Primary Role: Project coordination in National and International levels. I oversee the project's direction, integrating scientific insights into educational and training programs.

Tasks: Develop educational materials and training programs for athletes and coaches.

Implement management strategies to promote Para-billiards.

Conduct research on the psychophysiological benefits of Para-billiards for athletes.

Milestones:

Completion of Educational Curriculum: Develop and finalize the curriculum tailored for para-billiards athletes and coaches.

Launch of Training Workshops: Organize and conduct workshops using the developed curriculum to train athletes and coaches.

Publication of Research Findings: Conduct and publish research on the psychophysiological benefits of para-billiards, ensuring dissemination in relevant scientific journals.

Project implementer from Switzerland - Dr. Artur Mytko

Primary Role: Optimize the physical performance of Para-billiards athletes through biomechanical research.

Tasks: Study the biomechanics of Para-billiards players' movements.

Design and test adaptive equipment.

Develop guidelines for safe and effective training practices.

Milestones:

Initial Biomechanics Study Report: Complete and disseminate a report detailing the initial findings of the biomechanics study.

Prototype Adaptive Equipment: Design, test, and refine adaptive equipment for para-billiards athletes.

Finalized Training Guidelines: Develop and publish comprehensive training guidelines based on biomechanical research.

Applicant from Romania: Professor Potop Vladimir, Faculty of Science, Physical Education and Informatics, Department of Physical Education and Sport, National University of Science and Technology Politehnica Bucharest

Role: Project Coordination, National and International Liaison

Responsibilities: Overall project supervision, communication with international partners (Switzerland and Croatia), and meeting project milestones.

Conducting surveys, interviews, and data analysis to determine the current status of adaptive billiards nationally.

Creating and validating educational programs for trainers, organizing special events for wheelchair users, and hosting master classes from world-leading coaches to integrate official programs into practice.

Developing a strategy to get billiards included in the Paralympic Games, collaborating with Swiss and Croatian teams.

Applicant from Croatia: Dr., Professor Mario Baić, Dean of the University of Zagreb, Faculty of Kinesiology

Role: Project Coordination at Croatian scientific team.

Responsibilities: Overall project supervision, communication with international partners (Switzerland and Romania), and meeting project milestones.

Conducting surveys, interviews, and data analysis to determine the current status of adaptive billiards nationally.

Formulating a strategic plan for developing adaptive billiards, including infrastructure and policy recommendations, and collaborating with Swiss and Romanian teams.

Preparing educational and training session programs for persons with musculoskeletal disorders.

Creating and validating educational programs for trainers, authoring books, and organizing special conferences, workshops, round tables, and academic courses, collaborating with Swiss and Romanian teams.

Developing a global strategy for developing billiards as an adaptive sport (Para-billiards), collaborating with Swiss and Romanian teams.

Applicant from Croatia: Dr. Damir Pekas, Asst. prof. of University of Zagreb, Faculty of Kinesiology

Role: project executor

Responsibilities: Conducting surveys, interviews, and data analysis to determine the current status of adaptive sports nationally.

Preparing educational and training session programs for persons with musculoskeletal disorders.

The project schedule for 4 years:

Year 1: Baseline Assessment and Preliminary Development

Q1-Q2: Determine the Objective State of Development of Adaptive Billiards

Conduct a comprehensive international survey and review existing literature on adaptive billiards.

Establish a database of current practices, participation rates, and existing programs globally.

Q3-Q4: Develop a Strategic Plan for National and International Development

Analyze data collected in Q1-Q2 to identify gaps and opportunities.

Formulate a strategic plan for developing adaptive billiards, including short-term and long-term objectives.

Engage with stakeholders through workshops and conferences to refine the strategic plan.

Milestones:

Completion of the international survey and literature review.

Publication of a comprehensive report on the current state of adaptive billiards.

Finalized strategic development plan.

Year 2: Program Development and Pilot Implementation

Q1-Q2: Develop Educational and Training Programs

Design and create a curriculum for educational and training sessions tailored for individuals with musculoskeletal disorders.

Draft the official education programs for trainers, coaches, and instructors specializing in adaptive billiards.

Q3-Q4: Pilot Implementation and Initial Assessment

Implement pilot educational and training sessions in selected locations.

Begin training of coaches and instructors using the developed program.

Collect feedback and preliminary data on the effectiveness of the training sessions and coach education programs.

Milestones:

Development and publication of educational and training curricula.

Initiation of pilot programs and coach training.

Preliminary assessment report on pilot programs.

Year 3: Comprehensive Evaluation and Adjustment

Q1-Q2: Define the Influence of Billiards on Psychophysiological Conditions

Conduct studies to evaluate the psychophysiological benefits of adaptive billiards for individuals with musculoskeletal disorders.

Analyze data to identify trends and impacts on participants' health and well-being.

Q3-Q4: Technical and Tactical Training Development

Research and define the specific needs and techniques required for technical and tactical training of para-billiards players.

Develop and test advanced training modules based on findings.

Milestones:

Completion and publication of studies on psychophysiological benefits.

Development of advanced technical and tactical training modules.

Comprehensive evaluation report on the effectiveness of the programs.

Year 4: Strategy Finalization and Global Advocacy

Q1-Q2: Develop a Strategy for Inclusion in the Paralympic Games

Formulate a detailed strategy and advocacy plan to include billiards in the Paralympic Games.

Engage with international sports federations and Paralympic committees to present and promote the strategy.

Q3-Q4: Final Review and Global Dissemination

Conduct a final review of all programs and strategies, incorporating feedback and evaluation results.

Publish a comprehensive guide and best practices manual for developing adaptive billiards.

Organize an international symposium to disseminate findings and promote global adoption of the developed strategies.

Milestones:

Finalized strategy for Paralympic inclusion.

Publication of a comprehensive best practices manual.

Successful organization and execution of an international symposium.

Summary of Major Milestones Over 4 Years

Year 1:

International survey and literature review completed.

Strategic development plan finalized.

Year 2:

Educational and training curriculum developed.

Pilot programs were initiated, and a preliminary assessment was conducted.

Year 3:

Studies on psychophysiological benefits were completed.

Advanced technical and tactical training modules were developed.

Year 4:

Strategy for Paralympic inclusion finalized.

Best practices manual published.

International symposium conducted.

This structured and detailed schedule ensures systematic progress toward integrating individuals with musculoskeletal disorders into adaptive sports activities like billiards, aiming for global recognition and inclusion in the Paralympic Games.

2.5. Relevance and Impact

Importance

Integrating persons with musculoskeletal disorders into sports activities is crucial to promoting inclusivity, physical rehabilitation, and psychological well-being. Traditionally seen as a leisure activity, billiards have untapped potential as an adaptive sport. Our project's importance lies in its innovative approach to transforming billiards into a recognized adaptive sport. By developing targeted strategies and programs, we aim to enhance the accessibility and attractiveness of billiards for individuals with musculoskeletal disorders, ultimately fostering their integration into the broader sports community.

Our project addresses several critical needs:

Rehabilitation and Health Benefits: Engaging in sports like billiards can significantly improve the physical and psychophysiological health of individuals with musculoskeletal disorders.

Social Inclusion: Sports participation can enhance social interaction and integration, reducing feelings of isolation.

Skill Development: Adaptive sports can help individuals develop new skills and improve their quality of life.

Impact

The impact of our project will be multifaceted, spanning personal, societal, and institutional levels.

Personal Impact:

Enhanced Physical Health: Regular participation in adaptive billiards can improve motor skills, coordination, and overall physical health.

Improved Psychophysiological Well-being: Billiards's structured and goal-oriented nature can positively affect participants' mental health, reducing stress and enhancing self-esteem.

Societal Impact:

Increased Awareness and Acceptance: By promoting adaptive billiards, we aim to raise public awareness about the capabilities and contributions of individuals with musculoskeletal disorders.

Inclusivity in Sports: Our project will contribute to a more inclusive sports culture, encouraging other sports to adopt similar adaptive strategies.

Institutional Impact:

Educational Advancements: Developing specialized training programs for athletes and coaches will enrich educational content and methodologies in sports science.

Policy Development: Our research and findings will provide a foundation for policy recommendations aimed at integrating adaptive sports into mainstream sports policies, including the potential inclusion of billiards in the Paralympic Games.

Results

The anticipated results of our project include:

Objective State of Adaptive Billiards:

Comprehensive analysis and documentation of the current status of adaptive billiards internationally.

Development Plans:

Creation of targeted national and international plans for the development of adaptive billiards.

Educational and Training Programs:

Development and validation of specialized educational and training programs for individuals with musculoskeletal disorders.

Training Programs for Coaches:

Substantiation and implementation of training programs for coaches and instructors tailored to the needs of athletes with musculoskeletal disorders.

Psychophysiological Impact Analysis:

Detailed research on the effects of billiards on the psychophysiological condition of participants.

Technical and Tactical Training Features:

Identification and documentation of para-billiards athletes' specific technical and tactical training needs.

Paralympic Integration Strategy:

Strategic plan to advocate for the inclusion of billiards in the Paralympic Games.

Results Dissemination Plan

To ensure the widespread dissemination and utilization of our findings, we will implement a comprehensive results dissemination plan:

Academic Publications:

Publication of research findings in peer-reviewed journals in sports science, rehabilitation, and adaptive sports.

Conferences and Workshops:

Presentation of our results at international conferences, symposiums, and workshops dedicated to sports science, rehabilitation, and adaptive sports.

Educational Materials:

Development of accessible educational materials for athletes, coaches, and sports organizations, including manuals and online resources.

Partnerships and Collaborations:

Collaboration with adaptive sports organizations, rehabilitation centers, and educational institutions to implement our training programs and strategies.

Media Outreach:

Implementing media campaigns to raise awareness about the benefits and opportunities of adaptive billiards, utilizing traditional media, social media platforms, and sports networks.

Policy Advocacy:

Engaging with policymakers and sport’s governing bodies to advocate for the inclusion of adaptive billiards in official sports programs and events, including the Paralympic Games.

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CV

Viktoriia Nagorna
Current position(s): Senior researcher
Academic age: 12 year(s)

Education

Degree	Organisation	Duration
PhD / Dr.: Candidate of Sciences in Physical Education and Sports (Ph.D.) Dr. Shahlina Larysa Yan Genrihivna	National University of Ukraine on Physical Education and Sport, UA Research student	10.2003 - 10.2006 3 year(s) 1 month(s)
Master: Qualification master degree on recreation and health physical culture Dr. Shahlina Larysa Yan Genrihivna, Dr. Andreeva Olena Valeriyivna	National University of Ukraine on Physical Education and Sport, UA Physical education	09.2002 - 09.2003 1 year(s) 1 month(s)

Employment

Role	Organisation	Duration
Senior researcher	Eidgenössische Hochschule für Sport Magglingen - EHSM, CH Federal Office of Sport FOSPO	06.2022 - Present 1 year(s) 10 month(s)
Associate professor or similar	National University of Ukraine on Physical Education and Sport, UA Coach faculty	09.2015 - 10.2022 7 year(s) 2 month(s)
Group leader	Youth and Children Sport School "Yuniy Dinamivec", UA Sports School, billiards	09.2006 - 02.2022 15 year(s) 6 month(s)

Role	Organisation	Duration
Associate professor or similar	University of Zagreb, HR University of Zagreb Faculty of Kinesiology	09.2013 - 12.2016 3 year(s) 4 month(s)
Lecturer / Reader	National University of Ukraine on Physical Education and Sport, UA Coach faculty	09.2004 - 09.2015 11 year(s) 1 month(s)
basketball coach	Republican School of Physical Culture, Kyiv, UA Sport games	09.2000 - 06.2003 2 year(s) 10 month(s)

Major achievements

Achievement 1

Throughout my scientific journey, I have steadfastly adhered to the principle that "Science should not exist solely for its own sake." The selection of my research topics has always been intimately linked to the pragmatic challenges encountered in the realm of sports, challenges that have personally intersected with my path as an athlete, coach, and educator.
One pivotal moment in my early athletic career, during basketball training, saw me grappling with a hormonal imbalance precipitated by physical overexertion. This pivotal experience galvanized my curiosity, leading me to delve into the realm of women's health in sports. As an active contributor, I participated as an executor in the research project titled "Planning Competitive Performance Indicators for Elite Female Athletes Based on Hormonal Fluctuations", the findings of which continue to be actively integrated into the training process of elite female athletes participating in sports games. The most significant publications stemming from this research endeavor include:

[1] journal-article. 1. Borysova O, Nagorna V, Mytko A, Peretyatyko A, Polishchuk L. The influence of sexual dimorphism on the choice of tactical decision in the playing situation in individual sports. Journal of Physical Education and Sport (JPES). 2020;1(42):308-11. . DOI.
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Achievement 2

Presently, I maintain an active status as a professional athlete, having recently secured a silver medal at the prestigious European Pool Championship in 2023. However, my most notable accomplishments lie in my role as the coach of the Ukrainian national billiards team. It is within this capacity that I have spearheaded the development of a highly efficient algorithm aimed at preparing elite athletes for major international competitions. I am the author of several books on the planning of multi-year preparation of athletes in sports games and the developer of individual training programs for elite athletes. The outcomes of these scientific endeavors have been documented in the following publications:

[1] journal-article. 1. Shynkaruk O, Shutova S, Nagorna V, Serebriakov O, Scorohod O. Competitive performance of elite athletes in modern ice hockey. Journal of Physical Education and Sport (JPES), 2020. Supplement issue 1, Art 76, pp. 511 – 516. DO. DOI.
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Achievement 3

To understand the optimal technique of movements in the chosen sport, it is necessary to take into account the individual characteristics of the athlete and the specifics of the sport. This consideration is vital not only for optimizing the sports training regimen but also for safeguarding the well-being of every participant engaged in sports activities. In this context, biomechanical analysis and innovative advancements serve as invaluable allies for coaches and athletes, a testament that based on my personal experience in the project “Digital Twin”:

[1] conference-abstract. Oberhofer K, Achermann B, Nagorna V, Mytko A, Lorenzetti S. Digital Twin: Recent advances in digital technologies for monitoring strength training performance. Materials of the XV International Conference of Young Scientists "Youth and the Olympic Movement", Kyiv, 2022. - P. 42-44. . https://uni-sport.edu.ua/sites/default/files/vseDocumenti/zbirnyk_tez_molod_hv_zhovtlyst_22_dopovn_140_stor.pdf.
[2] conference-paper. 2. Nagorna V, Borysova O, Mytko A. Differentiation of muscular effort during stroke of high-level billiard players on game surfaces with different friction coefficient. Abstract and proceedings book of 14th International Scientific Conference of Sport Kinetics 2018 “Movement in Human Life and Health” Poreč, Croatia 24th – 27th June 2018. – P 216-221. . https://www.kif.unizg.hr/images/50005633/Proceedings%20of%2014th%20International%20Scientific%20Conference%20of%20Sport%20Kinetics%202018.pdf.

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6 March 2024, Viktoriia Nagorna, ORCID iD 0000-0003-2607-7412

1.1 Curriculum vitae

Dean Professor Mario Baić, PhD, born on February 26, 1974, in Zagreb, married, and has one child, Croat.

Education: He finished elementary and secondary school in Zagreb. He graduated from the Faculty of Physical Culture at the University of Zagreb in 1999 under the mentorship of Professor Josip Marić, PhD, with an additional professional specialization in wrestling. After completing his studies, he enrolled in the postgraduate specialist study in wrestling. In 2001, he passed his final exam and was appointed to the rank of Physical Education teacher. In 2003, under the mentorship of Professor Josip Marić, PhD (from Croatia) and co-mentorship of Professor Włodzimierz Starosta, PhD (from Poland), he successfully defended his master's thesis *Differences in the level of elected motorical and functional abilities by Polish and Croatian cadet wrestlers in classical style*
on topic wrestling. Professor Baić also passed all the required exams for completing the postgraduate scientific study and he earned the title of Master of Science. In 2006, he defended his doctoral dissertation *Differences between top-level Polish and Croatian wrestlers of different wrestling styles, age and weight categories in variables for the assessment of physical fitness* on topic wrestling under the mentorship of professor Hrvoje Sertić, PhD (from Croatia) and the co-mentorship of professor Włodzimierz Starosta (from Poland), PhD at the Faculty of Kinesiology University of Zagreb.

Teaching and professional activities: After graduating from the Faculty of Physical Culture, he was shortly employed (in 1999 as a substitute teacher) at the Zagreb Hotel and Tourism School as a physical education teacher. Between 2000, he worked as a professional wrestling coach in Croatian clubs. At the Faculty of the Kinesiology University of Zagreb, he actively participated in the scientific research project „Monitoring changes of the anthropological status of children in wrestling sports activities, “with professor Hrvoje Sertić, PhD, as the project leader. Professor Baić was also active as a demonstrator and an external associate in courses in Wrestling and Combat Sports. By the end of 2007, he was employed at the faculty of Kinesiology University of Zagreb as a senior assistant in the course Wrestling. In 2011, he was elected into the scientific and teaching rank and position of assistant professor at the faculty of Kinesiology University of Zagreb in the course wrestling. From 2013 he was the Vice-dean for Education and Students at the Faculty of Kinesiology University of Zagreb, as well as the president of several Committees (Committee for Education and Student Questions,

Committee for Final Thesis of Students at the Integrated Undergraduate and Graduate University Study of Kinesiology, Committee for E-learning, Committee for Quality Assurance) and a member of the Workgroup for study programs at the University of Zagreb. Professor Mario Baić, PhD,

is currently also the course teacher in the course Sports and Law at the Faculty of Kinesiology University of Zagreb and a member of the Committee for Recognition of Foreign Education Qualifications in the field of Kinesiology in the Republic of Croatia. From 2017-2022 he was dean/s councilor for quality assurance at the Faculty of Kinesiology University of Zagreb, as well as the member of several Committees (Committee for Education and Student Questions, Committee for Science and Ethics, Committee for Quality Assurance etc..), and ECTS coordinator at the International Relations Office at the Faculty of Kinesiology. Currently, Professor Baić holds the position of dean of the Faculty of Kinesiology at the University of Zagreb, Croatia.

Expert activity: He has been active as an athlete since his early adolescence, and besides wrestling, he had experience in water polo, karate, billiards sports, and skiing for a short period. As a wrestler, he went through all competition age categories. In 1989, he won 2nd place in Greek-Roman wrestling at the National Junior Championship and 2nd place in Freestyle Wrestling at the 1995 Senior National Championship. He coached a dozen medal winners in Croatian Championships in all age categories (boys, cadets, juniors and seniors). He holds the present record as a coach with 6 gold medals out of 10 weight categories at the Croatian National Cadet Championship. He has been a wrestling coach since 1994 in numerous wrestling schools. He was the head coach of the 200 wrestling club members Metalac. As of 2000, he has been working as a professional wrestling coach. Over 2 years, he was also the assistant coach of the National Cadet Team (2002, 2003), whereas for 4 years he was also the head coach of the mentioned cadet team (2004, 2005, 2007, 2008). Together with his wrestlers from his club and the national team, Mario Baić accomplished numerous impressive results. At the European Cadet Championship in 2005 in Albany, he won 3rd place with Siniša Hogač, the first Croatian cadet medal ever won at a European Championship competition. In addition, another 3 wrestlers were positioned among the top 10 in their respective categories. Between 2010 and 2011, he was the head coach (selector) of the Senior, Junior, and Cadet National Team, and in 2010 he won a total of 4 medals at the European and world championships. That year, the Croatian Wrestling Federation was nominated by the Croatian Olympic Committee as one of Croatia's most successful sports federations. He is currently a member of the Executive Board of the Croatian Wrestling Federation and the Croatian Wrestling Coaches Association. Mario Baić was also a member of the Executive Committee, the president of the Expert Programme Committee of the Zagreb Sports Federation, and a member of the Committee for the production of the new Sports Act. In addition to the above-mentioned, Professor Mario Baić was the head of the Licensing Seminar for Croatian Wrestling Coaches, and he has also (both as a single author and a co-author) published numerous professional papers on wrestling in conference proceedings of national and international scientific and professional conferences. He was also a member of the Organization Committees of countless domestic and international scientific and professional conferences in sports and kinesiology. He spent a short time in Germany, Italy, Poland, Russia, Hungary, and China as part of his professional training. He is a member of the Scientific Committee of the United World Wrestling (UWW).

Scientific activity:

He was appointed to the scientific rank of scientific associate in the scientific area of social sciences – field of kinesiology on June 17, 2009. He participated in numerous scientific and expert research projects and conferences and published many papers. Until now, he has published over 50 scientific papers (as a single author or co-author), and he was the first editor of two Proceedings Books. He was an associate in producing a part of a textbook by professor Hrvoje Sertić, PhD, titled “Basics of Combat Sports (judo, karate, wrestling)”. He is also one of the authors of the textbook “Application of Wrestling in Other Sports”. Professor Baić participated (or is currently participating) as an associate in projects implemented by the Ministry of Science, Education and Sport of the Republic of Croatia, “Monitoring changes of the anthropological status of children in wrestling sports activities, “with professor Hrvoje Sertić, PhD, as the project leader. In addition to all the above mentioned, Professor Mario Baić, PhD, is also the Vice president and a member of multiple organizations and program committees in international scientific and professional conferences. Likewise, he was a member of the scientific committee of the Journal of Combat Sports and Martial Arts and a reviewer in the International Journal of Wrestling Science. In February 2016, he was appointed senior scientific associate at the Faculty of Kinesiology at the University of Zagreb. In 2017, he was an Organising Committee president of the International Scientific and professional conference on Wrestling, “Applicable Research in Wrestling,” which was held in Novi Sad, Serbia, and he was the first editor of the Conference Proceedings Book. In 2017, he was an Organising Committee president of the International Scientific and professional conference on Wrestling, “Applicable Research in Wrestling,” which was held in Novi Sad, Serbia, and he was the first editor of the Conference Proceedings Book. He was an Organising Committee president of the 14th International Scientific Conference of Sport Kinetics 2018 “Movement in Human Life and Health” held in Poreč, Croatia, and he was the first editor of the conference Proceedings book. He is currently a member of the Editorial Board of the International Journal of Wrestling Science (USA) and a few others. In 2018, he was elected to the International Scientific Association Presidium of the International Association of Sport Kinetics (IASK) as Vice-President.

Awards and acknowledgments:

- 2003 – he was awarded the Special Award for Young Scientists at the International conference in Poland.
- 2010 – he was awarded an acknowledgment by the Faculty of Kinesiology at the University of Zagreb for his exceptional accomplishments and professional work in sports.
- 2014 – he was awarded the FILA Award (medal of the World Wrestling Federation) for the promotion and development of wrestling in the Republic of Croatia and worldwide

Contact:

Prof. Mario Baić, PhD

Faculty of Kinesiology University of Zagreb

Horvaćanski zavoj 15, Croatia

E mail: mario.baic@kif.hr

Mobile/Viber/WhatsApp: 00385-91-254 9418

Scientific papers can be see on links:

https://www.researchgate.net/profile/Mario_Baic

https://scholar.google.hr/citations?user=7oDp_9EAAAAJ&hl=en

http://bib.irb.hr/lista-radova?autor=283706&autorsko=Prika%BEi+radove

PERSONAL INFORMATION

Potop Vladimir

6 Gura Vadului Street, Bucharest, 032339, Romania

0040721324867

e-mail address: vladimir_potop@yahoo.com

Yahoo – vladimir_potop; Skype – potop.vladimir; linkedin – vladimir-potop-08725459

ScopusAuthorID: 57205522560; **Publons** (ResearcherID – **WoS**): C-9062-2017;

ORCID: 0000-0001-8571-2469; Research Gate (RG): Potop_Vladimir

Gender Male | Date of birth 31/07/1975 | Nationality Romanian

AFFILIATION

National University of Science and Technology Politehnica Bucharest, University Center Pitești
Faculty of Sciences, Physical Education and Informatics
Department of Physical Education and Sport

PROFESSIONAL EXPERIENCE

October 2023 to present
University Professor
Faculty of Science, Physical Education and Informatics
Department of Physical Education and Sport,

National University of Science and Technology Politehnica Bucharest
University Center Pitești, Str. Târgul din Vale, nr.1

110040 Pitești, Argeș, Romania, www.upit.ro

From March 2021 to September 2023
University Lecturer
Faculty of Sciences, Physical Education and Informatics

Department of Physical Education and Sport,
University of Pitești, Str. Targul din Vale, nr.1
110040 Pitesti, Arges, Romania, www.upit.ro

March 2021 to present
PhD supervisor
Facultatea de Științe, educație fizică și Informatică
Departamentul de educație fizică și sport,
Universitatea din Pitești, Str. Targul din Vale, nr.1
110040 Pitesti, Arges, Romania, www.upit.ro

From September 2020 - February 2021
Doctoral supervisor (associate)

Doctoral School of Sport Science and Physical Education
Headquarters: Aleea Școlii Nornale, nr. 7., Pitești
University of Pitești

https://www.upit.ro/ro/academia-reorganizata/studii-de-doctorat/scoli-doctorale/scoala-doctorala-stiinta-sportului-si-educatiei-fizice

From 2014 to 2021
University Professor
Faculty of Physical Education and Sport
Ecological University of Bucharest, Bl. Vasile Milea nr.1G, www.ueb.ro

Type or sector of activity: Teaching, evaluation, assessment, verification and grading in the following subjects: basic gymnastics; gymnastics method, skating, artistic gymnastics; bachelor, master.
Subjects: Artistic gymnastics, Aerobic gymnastics, Bodybuilding and fitness, Sports dance, Weightlifting.
2016 to present
University teacher, hab.
State University of Physical Education and Sport, Andrei Doga Street 22, Chisinau, Moldova; http://www.usefs.md
Type or sector of activity:
Master's studies: sports training technology - specialization Gymnastics.
Doctoral School: Doctoral supervisor
From July 2020 to February 2021
Dean
Faculty of Physical Education and Sport
Ecological University of Bucharest, Bl. Vasile Milea nr.1G, www.ueb.ro
-Convenes, as Chair, the meetings of the Faculty Council;

- -He is in charge of the Faculty development strategy during the term of office;

-implements, at the Faculty level, the decisions of the University Senate, the Administrative Council, and the Rector's dispositions;
-establishes the attributions of the Vice-deans and other subordinate structures;

-chairs, as chairperson, the License Committees, etc
-other attributions foresaw in the Charter of the Ecological University of Bucharest.
Type or sector of activity: Coordination, guidance, control
From March 2020 to June 2020
Interim Dean

Faculty of Physical Education and Sport
Ecological University of Bucharest, Bl. Vasile Milea nr.1G, www.ueb.ro
-Convenes, as Chair, the meetings of the Faculty Council;
-He is in charge of the Faculty's development strategy during his/her term of office;

-implements, at the Faculty level, the decisions of the University Senate, the Administrative Council, and the Rector's dispositions;
-establishes the attributions of the Vice-deans and other subordinate structures;
-chairs, as chairperson, the License Committees, etc
-other attributions foresaw in the Charter of the Ecological University of Bucharest.

Type or sector of activity: Coordination, guidance, control
From 2012 to 2020

Head of Department
Faculty of Physical Education and Sport

Ecological University of Bucharest, Bl. Vasile Milea nr.1G, www.ueb.ro

▪ Coordinating: elaboration of the discipline masterplans,
▪ Elaboration: curricula and job descriptions,
▪ Calculation of teaching norms corresponding to teaching functions,
▪ Collaboration contracts and the drafting of partnership documents with educational establishments or other institutions (high schools, sports clubs, sports federations),
▪ Organization of cultural, sporting, and artistic events.)
Type or sector of activity: Coordination, guidance, control

From 2014 to 2018

Associate lecturer (prof. univ. Dr.)
Faculty of Physical Education and Sport

National University of Physical Education and Sport, Bucharest, Str. Constantin Noica, Nr. 140, Sector 6, CP. 060057, Bucharest, Romania; www.unefsb.ro
Master Program: Performance in Sport

Type or sector of activity: Teaching, evaluation, assessment, verification, and grading in the discipline: Applied Biomechanics
From 2008 to 2014
Lecturer
Faculty of Physical Education and Sport
Ecological University of Bucharest, Bl. Vasile Milea nr.1G, www.ueb.ro
www.ueb.ro
Type or sector of activity: Teaching, evaluation, assessment, verification, and grading in the subjects: Gymnastics. Methodology of gymnastics disciplines: bachelor, master
Subjects of specialization: Artistic gymnastics, Aerobic gymnastics, Bodybuilding and fitness, Sports dance, Weightlifting.
From 2002 -2014; 2017 - present
Collaborating teacher (volunteer)
Club Sportive Scholar Dinamo Bucharest, Bl. Ștefan Cel Mare nr.9

Type or sector of activity: Sports training (women's artistic gymnastics), collaboration prof. Cîmpeanu Mariana
From 2008 to 2012

Head of Department: Fundamental disciplines, collective/individual sports
From 2008 to 2012
Head of Department: Fundamental disciplines, collective/individual sports
Ecological University of Bucharest, Bl. Vasile Milea nr.1G, www.ueb.ro
www.ueb.ro
▪ Coordination of the elaboration of the discipline descriptions,
▪ Elaboration of curricula and job descriptions,
▪ Calculation of teaching norms corresponding to the teaching functions,
▪ Collaboration contracts and drafting of partnership documents with educational establishments or other institutions (high schools, sports clubs, sports federations), Organization of cultural-sport and artistic events).
Type or sector of activity: Coordination, guidance, control
From 2005 to 2008
Head of works
Ecological University of Bucharest, Bl. Vasile Milea nr.1G, www.ueb.ro
www.ueb.ro
Type or sector of activity: Teaching, evaluation, assessment, verification, and grading in the following subjects: Basic gymnastics, swimming, gymnastics deepening; Courses, seminars, practical works: License
From 2002 to 2006
Associate lecturer, associate, and tenured assistant lecturer
Faculty of Humanities
Valahia University; Str. Aleea Sinaia, nr. 13, 130004 Targoviste, Dambovita; www.valahia.ro
Type or sector of activity: Teaching, evaluation, assessment, verification, and grading in the following subjects: Basic gymnastics; gymnastics deepening, sport dance
From 2001 to 2004
Collaborating university assistant
Faculty of Physical Education and Sport
Spiru Haret University of Bucharest. Str. Ion Ghica, Nr. 13, Sector 3, Bucharest, Postal Code: 030045; www.spiruharet.ro
Type or sector of activity: Teaching, evaluation, assessment, verification, and grading in the following subjects: Basic gymnastics, gymnastics deepening
From September 1997 - June 2010, September 2014 - June 2017
Substitute teacher, titular and collaborator
School Sports Club no.2 in Bucharest
Type or sector of activity: Sports training (women's artistic gymnastics)
From 1996 to 1997
Gymnastics instructor
"Triumf" Sports Club in Bucharest
Type or sector of activity: Sports training (women's artistic gymnastics)
From 1994 to 1998
Gymnastics instructor (voluntary)
School Sports Club No. 3 "Steaua" Bucharest
Type or sector of activity: Sports training (women's artistic gymnastics), under the guidance of Prof. Alina Goreac

EDUCATION AND TRAINING

From 2020 December 16 -17
Certificate
"Expert assessment of the originality of scientific works using the Antiplagiat system". "Similarities in scientific publications. Citation culture".

From 2020 April 14-29

Certificate
"Web of Science Group Resources for Scientists and Journals" A Clarivate Analyti

"Web of Science: a navigation system in the world of scientific publications" Web of Science Group / A Clarivate Analytics company
"Practical guidelines for publication in international journals" Web of Science Group / A Clarivate Analytics company
"Ethics of scientific publications and tools for improving their quality: Web of Science and Antiplagiat"

Web of Science Group / A Clarivate Analytics company
From 2020 April 3
Certificate
Has contributed to the success of: "Interactive tools in online education"in NTU "KhPl", Kharkiv, 03.04.2020

From 2020 March 23 - 29
Certificate
Has developed essential digital skills and contributed to the success of:

- "Digital Expertise in Ukraine and Europe" in NTU "KhPl", Kharkiv, 26.03.2020
- "Scientific Integrity" in NTU "KhPl", Kharkiv, 25.03.2020
- "Scientist Image Formation in the Information Space" in NTU "KhPl", Kharkiv, 24.03.2020
- "Multidiscipline Resources: Information Search, Analysis and Systematization" in NTU "KhPl", Kharkiv, 23.03.2020

From 28 - 30.11.2019
Certificate - Gymnastics coach

Professional Development, National Center for Training and Development of Coaches, Romanian Gymnastics Federation - Women, Series A 09996
From 2013 to 2016
Diploma of Doctor of Physical Education and Sport
The National University of Ukraine on Physical Education and Sport in Kyiv, Ukraine
Postdoctoral studies
From 13 - 14.02.2013
Certificate - Gymnastics Coach

Professional Development Course, National Center for Training and Development of Coaches, Romanian Gymnastics Federation, Series A 04747
From 2012 to 2013
Advanced Diploma

The National University of Ukraine on Physical Education and Sport in Kyiv, Ukraine
Qualification Improvement Department
Scientific research in gymnastics theory and gymnastics methodology at the department Sports branches of gymnastics and dance

Post University Studies

Since 2012, month 05 date 28
Graduation certificate
Trainer, COR code 242401

Organized by Corpul de experților în accesarea fondurilor structurale și de coeziune europene, București, sector 2
Preparation of training; implementation of training programs; evaluation of training participants; application of unique training methods and techniques; training marketing; design of training programs; organization of training programs and traineeships; evaluation, review, and quality assurance of training programs and traineeships
The pool of experts in accessing European Structural and Cohesion Funds
Specialization course
From 2009 to 2011
Master Degree

Ecological University of Bucharest; Faculty of Economics
Field Finance
Study Program: Project Finance and Administration
Strategic Environment of the European Economy, European Project Financing Funds, Methodology of Project Design and Implementation, Project Management, Human Resources Management, Economic and Financial Analysis of Projects by Activity Areas, etc.
Cycle II - Master's Degree

From 3.01.2011 - 31.12.2013
Graduation certificate
Field "Quality in Higher Education"
Graduated the Training and Awareness Program in Quality Assurance in Distance Learning - ID, organized and carried out by Spiru Haret University, within the Project POSDRU/86/1.2/S/60720 framework.
Development and implementation of a system for monitoring, continuous improvement, and evaluation of quality in open and distance higher education based on performance indicators and international quality standards.
From 2011 month 12 date 17

Graduation certificate
Mentor, COR code 235902
Organized by ZECE PLUS

Characterization of the current level of women's gymnastics in the world and development trends in the light of the 2009-2012 scoring code; analysis and discussion of the competition calendar and classification program; requirements of contemporary training in general and gymnasts' training in particular; Methodology and technique of basic training in uneven bars, vault, vault, beam and acrobatics; Physical preparation of gymnasts; Traumatology specific to women's gymnastics and protective measures; Choreographic preparation of gymnasts; Restoration - methods and means; Applications of physiotherapy in sports training.
National Center for Training and Development of Coaches, Romanian Gymnastics Federation - women
Professional training course

From 1998 to 2004
PhD in Physical Education and Sport
Doctoral dissertation topic: Adjustment of motor behavior in the learning and improving high-difficulty elements in women's artistic gymnastics.
National Academy of Physical Education and Sport Bucharest

Since 23.12.2002
Language proficiency certificate
Valahia University of Targoviste.

Since 2001
Certificate
section: INFORMATICS and ENGLISH LANGUAGE
Council for Regional Development South Muntenia, Dâmbovița County School Inspectorate, Casa Corpului Didactic, "Coresi" School in Târgoviște
In-service training course

Since 1999
Certificate - teacher
Specialty Physical Education
National Academy of Physical Education and Sport - Bucharest
Course of finalization in teaching

From 1997 to 1998
Diploma of advanced studies
Sport training, bioenergetics, sport psychology, sports psychology, specialization in a branch of sport, etc.
National Academy of Physical Education and Sport - Bucharest, Faculty of Physical Education and Sport
Postgraduate courses in Physical Education and Sport,

Specialization: High Performance Sports Training.
From 1993 to 1997
Bachelor degree in EFS
Anatomy, physiology, kinetology, athletics, gymnastics, sports games, swimming, judo, wrestling, boxing, EFS theory and methodology, sports training, etc.
National Academy of Physical Education and Sport - Bucharest, Faculty of Physical Education and Sport; Discipline - Gymnastics

License in Physical Education and Sport

From 1990 to 1993
Graduation diploma
Moldovan Technical School of Physical Culture, Chisinau, Republic of Moldova
Specialization: teacher organizer of physical culture
Gymnastics coach, referee

Sport category: II
From 1981 to 1990
Certificate of graduation from 9th grade
Secondary school of loc. Limanscoe, Reni district, Odessa region, Ukraine

PERSONAL COMPETENCES

Mother tongue: Romanian

Other known foreign languages

	INTELEGERE		SPEECH		WRITING
	Listening	Reading	Participate in conversation	Discuss oral	
Russian	C1/2	C1/2	C1/2	C1/2	B1/2
	Experienced user				
English	A1/2	A1/2	A1/2	A1/2	A1/2
	Basic user				

Levels: A1/2: Elementary user - B1/2: Independent user - C1/2: Experienced user
Common European Framework of Reference for Languages

Communication skills: Team spirit, self-motivated, creative, excellent communication skills, high adaptability, reliability

Organizational/managerial skills: Ability to synthesize and analyze decision-making skills

Workplace skills: Good knowledge of organizational and coordination processes (currently department manager)

Computer skills: Microsoft Office, Corel, internet user, video capture and processing programs, biomechanical analysis, etc.

Other skills: Hobbies: sports, music, reading, hiking, billiards

Driving license: Category B

FURTHER INFORMATION

Publications

- ISI Web of Science indexed journals: 65 articles
- Scopus indexed journals: 82 articles
- BDI journals: 18 full-text articles
- International indexed (WoS and BDI)

Conferences

- Papers (articles) published in refereed journals and conference proceedings (not indexed) - 77

Memberships

- International Association of Physical Culture and University Sport
- Romanian Sport Science Council (2021)
- FIEPS Romania - present.

R&D Projects

National selection project "Re-launching Romanian Gymnastics": Member of the selection and training team of the center at Dinamo Sports Club in Bucharest, Funding: Petrom Romania (2.5 mil. Euro), valid for 3 years: 2014-2017.
The research project, theme 2.32: "Technical training of qualified athletes based on rationalization technique competitive exercises." 2016-2017 (Prof. Univ.dr. Gamaliy V.V.; Litvinenco Yu.V., Prof. Univ.dr. Boloban V.N., Potop V.). UDK 796.41.015.134:531.36; Registration No: 0116U002571. National funding code: 7713 (880,0 grn.)

Research grant, theme: "Research on improving the performance of athletes (field hockey, football) by optimizing cardiovascular and neuromuscular parameters", registered under no. 67/15.01.2018. Project manager: Urichianu-Toma Sanda; Partner coordinator Potop Vladimir. Project budget: 125.000 lei. Grant duration - the grant duration is 24-36 months, with the possibility of extension in exceptional cases, up to a maximum of 12 months, to fulfill the minimum performance criteria, without additional funding; registered under no. 67/15.01.2018; https://chiajnamedical.ro/proiecte-de-cercetare/

The research project, theme 2.11: "Statodynamic stability as a basis for technical training of those involved in sport gymnastics views." 2016-2020. (Prof. Dr. Boloban Victor; Maksimova A.J. Department of Gymnastics of the National University of Physical Education and Sport of Ukraine). UDK 796.41.015.134.531.36; Registration No.: 0116U001612

Research grant, topic: 'Adjustment of physical exertion parameters in 8-10 years old football players based on changes in cardiovascular indices'. Dentirad Hospital Group. The total value of the project is 125.000 lei. Project Director: Potop Vladimir; registered under No. 114/18.11.2019. https://www.dentirad.ro/anunt-de-lansare-a-competitiei-pentru-un-grant-de-cercetare-stiintifica/

Research Project. Entered between Chiajna Medical Center S.R.L., administrator conf. Univ. Dr. Timnea Olivia Carmen is a provider, and Queisser Pharma S.R.L. is the beneficiary, Ms. Caba Teodora Caba.

Theme 1: Increasing joint mobility post-operative ligamentoplasty with collagen supplementation. Contract Nr. 25/18.03.2021
Theme 2: Increase joint mobility and stability in patients with gonarthrosis with the help of collagen 11.000 Plus supplement. Contract No. 26/18.03.2021
Research grant, topic: Benefits of natural sod product in normalization of muscle creatine kinase and liver enzymes in performance athletes. Registered No. 18/5.05.2022. Project budget: 125.000 lei. Project director: conf. Univ. Dr. Timnea Olivia Carmen.
Partner coordinator: prof.univ.dr. Măhăilă Ion
Members: Potop Vladimir, Jurat Valeriu, Moga Carolina.
Expenses borne by Chiajna Medical Center - logistic expenses - laboratory consumables, small equipment, material expenses and fees for the publication of articles on the project. https://www.chiajnamedical.ro/rezultat-competitie-proiect-cercetare-2022/

Awards or other recognition of scientific contributions

Letter of appreciation The International Association of Universities of Physical Education and Sport expresses its gratitude for your contribution is significant to the development of sports science and education!

Diploma of Excellence from the City Hall of Sector 3, Bucharest, for outstanding results in training and educating young students - 2008, 2009, and 2010.

Honor Diploma, "Romanian Athenaeum" Society 150 years (1865-2015), for contribution to promoting Romanian science and culture.

Diploma of excellence for involvement in the national project "Relaunching Romanian Gymnastics, Country, country we want Champions. 7.06.2014. CS Dinamo

Honor Diploma on the occasion of the 30th anniversary of the foundation of the Ecological University of Bucharest, 1990-2020.

Potop Vladimir,

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Federal Department of Defence,
Civil Protection and Sport DDPS

Federal Office of Sport FOSPO
Swiss Feder Institute of Sport Magglingen SFISM

CH-Magglingen 2532 FOSPO;

POST CH AG

File reference: BASPO-
Magglingen, 07 May 2024

The commitment of the host institution for the MAPS project

To whom it may concern,

I am writing to express our institution's commitment to the MAPS project, specifically supporting the proposal entitled "**Strategy for the Development of Billiards as an Adaptive Sport (Para-billiards) Globally**," submitted by Dr. Nagorna Viktoriia.

The Federal Office of Sport FOSPO, Swiss Federal Institute of Sport Magglingen SFISM, as the applicant's legal entity, hereby confirms that we will uphold the obligations outlined below should the proposal mentioned above be retained:

Performance Obligations:
We commit to engaging Dr. Viktoriia Nagorna as the principal investigator for the grant, ensuring her compliance with eligibility requirements and personal responsibility for the approved project.
Applicant Eligibility:
Our institution ensures applicants meet the eligibility criteria defined in Article 4 and Article 5 of the RIPA, including research activity, employment status, project leadership capabilities, and access to necessary research infrastructure.
We affirm that SFISM will uphold these obligations and requirements and actively support the successful implementation of the proposed project.

Please do not hesitate to contact us for further information or clarification regarding our commitment.

Thank you for considering our institution's dedication to this vital endeavor.

Warm regards,

Urs Mäder,
Rector SFISM

Federal Office of Sport FOSPO
Swiss Federal Institute of Sport Magglingen SFISM
Urs Mäder
Hauptstrasse 247
2532 Magglingen
Tel. +41 58 46 76253
urs.maeder@baspo.admin.ch
www.baspo.admin.ch

D1 - Declarație privind nefinanțarea din alte surse, certificarea legalității și corectitudinea informațiilor transmise

Subsemnatul, Vladimir Potop declar pe propria răspundere că activitățile și lucrările din cadrul propunerii de proiect cu titlul: "Strategy for the Development of Billiards as an Adaptive Sport (Para-billiards) Globally" depusă în competiția MAPS (Multilateral Academic Projects), Call for Proposals 2024, Second Swiss Contribution **nu sunt și nu au fost finanțate din alte surse bugetare.**

De asemenea, confirm că informațiile incluse în această propunere de proiect, precum și detaliile prezentate, sunt legale și corecte.

Declarație pe proprie răspundere, sub sancțiunea eliminării din competiție sau sancțiunile aplicate faptei de fals în acte publice.

Data: 01.07.2024

Numele și prenumele: Vladimir Potop
Responsabil de proiect
Semnătura

D2 - Declarație pe propria răspundere a instituției gazdă privind încadrarea în definiția organizației de cercetare

Condiții cumulate

Subsemnatul, Costoiu Mihnea, în calitate de rector al Universității de Știință și Tehnologie Politehnica din București, declar pe proprie răspundere că următoarele condiții sunt îndeplinite cumulat:

- Este instituție de învățământ superior*, sau activitatea de CD este principala activitate din statut, sau din actul juridic de înființare, sau obiectul principal de activitate este diseminarea la scară a rezultatelor unor activități CD prin predare sau publicare sau transfer de cunoștințe;
- În cazul în care există întreprinderi care pot exercita o influență decisivă asupra organizației (prin asociați sau acționari), acestea nu au acces preferențial la rezultatele de cercetare generate de organizație, conform unei declarații pe propria răspundere în acest sens;
- În bilanț, sau în balanța cu situația analitică, toate activitățile non-economice, cheltuielile, veniturile și finanțarea acestora sunt prezentate separat de activitățile economice. Activitățile de transfer de cunoștințe au caracter non-economic, în cazul în care acestea sunt efectuate fie de organizația de cercetare (inclusiv departamentele sau filialele acesteia), fie în comun cu astfel de entități, sau în numele acestora, și toate profiturile din activitățile respective sunt reinvestite în activitățile de bază non-economice ale organizației de cercetare (activități CD independente sau în colaborare, diseminare non-exclusivă și nediscriminatorie a rezultatelor de CD, educație publică). Caracterul non-economic al activităților de transfer de cunoștințe nu este periclitat de contractarea prestării de servicii corespunzătoare către părți terțe prin intermediul unor licitații deschise;
- Activitatea economică este auxiliară, cu alte cuvinte corespunde unei activități care este absolut necesară pentru funcționarea organizației de cercetare, sau care este legată intrinsec de utilizarea non-economică principală a acesteia și care are un domeniu de aplicare limitat. Se va considera că așa stau lucrurile atunci când activitățile economice consumă exact aceleași tipuri de resurse (de exemplu, materiale, echipamente, forță de muncă și capital fix) ca și activitățile non-economice, iar ponderea alocată în fiecare an unor astfel de activități economice nu depășește 20% din total anual de resurse alocate de entitatea respectivă.

Declarație pe proprie răspundere, sub sancțiunile aplicate faptei de fals în acte publice

Data: 01.07.2024
Reprezentant legal

Funcția: Rector
Numele și prenumele: Costoiu Mihnea
Semnătura

Responsabil de proiect

Numele și prenumele: Vladimir Potop
Semnătura

*) *Inclusiv nucleele de cercetare constituite în cadrul unor spitalele sau muzee, care îndeplinesc criteriile cuprinse în definiția organizației de cercetare prevăzută la pct. 83 din Regulamentul UE nr. 651/2014, cu modificările și completările ulterioare.*

D3 – Declarație pe propria răspundere privind eligibilitatea financiară a instituției gazdă

Declarăm pe proprie răspundere că *Universitatea de Știință și Tehnologie Politehnica din București* nu este declarată conform legii, în stare de incapacitate de plată şi nu are plăţile / conturile blocate conform unei hotărâri judecătoreşti.
De asemenea, unitatea nu se face vinovată de:

- declaraţii inexacte cu privire la informaţiile solicitate de Autoritatea Contractantă, în vederea selectării contractorilor;
- încălcarea în mod grav a prevederilor unui alt Contract de finanţare încheiat anterior cu o Autoritate Contractantă.

Declaraţie pe proprie răspundere, sub sancţiunile aplicate faptei de fals în acte publice

Data: 01.07.2024
Reprezentant legal

Funcţia: Rector
Numele şi prenumele: Costoiu Mihnea
Semnătura

ROMÂNIA MINISTERUL EDUCAȚIEI UNIVERSITATEA NAȚIONALĂ DE ȘTIINȚĂ ȘI TEHNOLOGIE POLITEHNICA BUCUREȘTI RECTOR PROFESOR 2

D4 - Declarație pe propria răspundere a instituției gazdă prin care se certifică acceptarea implementării proiectului în instituție

Subsemnatul Costoiu Mihnea, în calitate de rector al Universității de Știință și Tehnologie Politehnica din București, declar pe proprie răspundere că, în cazul în care proiectul cu titlul „ Strategy for the Development of Billiards as an Adaptive Sport (Para-billiards) Globally" este finanțat, instituția acceptă implementarea proiectului, asigură sprijin administrativ și pune la dispoziția echipei de proiect infrastructura necesară, asigură angajarea directorului de proiect (coordonatorul partener din România) cu normă întreagă și a membrilor echipei de proiect, în condițiile legii și cu respectarea prevederilor Pachetului de informații (inclusiv Contractul de finanțare), pe întreaga perioadă a implementării proiectului.

Data: 01.07.2024

Reprezentant legal
Funcția: Rector
Numele și prenumele: Costoiu Mihnea
Semnătura

Declarație TVA

Declarăm pe propria răspundere că Universitatea de Știință și Tehnologie Politehnica din București în calitate de partener al proiectului "Strategy for the Development of Billiards as an Adaptive Sport (Para-billiards) Globally", Second Swiss Contribution, ~~recuperează~~/nu recuperează TVA de la autoritățile fiscale naționale în conformitate cu reglementările fiscale naționale.

Data: 01.07.2024
Reprezentant legal

Funcția: Rector
Numele și prenumele: Costoiu Mihnea
Semnătura

ROMÂNIA PROREKTOR UNIVERSITATEA NAȚIONALĂ DE ȘTIINȚĂ ȘI TEHNOLOGIE POLITEHNICA BUCUREȘTI MINISTERUL EDUCAȚIEI

Director economic/Contabil șef

Numele și prenumele: Dorina Adamescu
Semnătura

Director proiect/Responsabil de proiect

Numele și prenumele: Vladimir Potop
Semnătura

Multilateral Academic Projects
MAPS
Strategy for the Development of Billiards as an Adaptive Sport (Para-billiards) Globally
Institutional Support Letter

INSTITUTIONAL SUPPORT	
Existing equipment that will be made available to the research group (provide description and quantity of the equipment). Next to the name of the equipment please provide the link to Croris	
Describe administrative and technical support and facilities that will be made available to the research group.	Faculty of Kinesiology (KIFZG) will secure full administrative, technical and financial assistance for the project through designated departments (notably the Office for preparation and implementation of national and EU projects). Furthermore, the parent institution will supplement the budget received from the funding body with up to 3 600 EUR per an associate affiliated with the institution for dissemination and costs of securing open access to publications produced by the project, according to currently valid internal policies and regulations. This totals up to 7 200 EUR for the whole duration of the project. KIFZG will also take part in organization of conferences, workshops, and certification programs.
Obligations of the Applicant within the Institution (teaching and administrative duties).	The applicant has no special administrative duties at the Faculty of Kinesiology or at the University of Zagreb, and his administrative duties are within the stipulated 10% of the total working time in accordance with the valid collective agreement for science and higher education. Since the entry into force of the current collective agreement for science and education, teaching duties of the applicant have been reduced by the maximum amount prescribed by the collective agreement, and amount to 27% of working time. The same distribution of working hours is foreseen for the whole duration of this project. Preparing educational and training session programs for persons with musculoskeletal disorders.
Describe how the proposed research fits into the Institution's research strategy.	The proposed project is in accordance with the basic mission and vision of the Faculty of Kinesiology and the following strategic documents: Strategy of research, technology transfer and innovation of the University of Zagreb, Strategy of the Faculty of Kinesiology of the University of Zagreb and Science Development Strategy of the Faculty of Kinesiology from 2023-2028. The proposed project fits into several goals of the current Science Development Strategy of the Faculty. In the part pertaining to the development of the institution, SDBASG is in accordance with the main strategic goal of increasing the international scientific visibility and recognition of the Faculty and partial strategic goals 1.2, 1.3, 2.1, 2.2., 2.3, 3.1, 3.2 and 3.3 through: a) Development of human resources and research infrastructure; b) Ensuring the transfer of knowledge at all levels of study and improving the Faculty's scientific and social visibility, and c) Strengthening scientific excellence and increasing research capacity. The science development strategy 2023-2028 also defines research topics of special interest to the institution, and this project belongs to the main research directions in the areas: P1.2.b. RESEARCH IN THE FIELD OF PLANNING AND PROGRAMMING OF KINESITHERAPY PROCEDURES , study of areas of adapted physical activity with the aim of promoting the health of children and adults with disabilities ▪ developmental research on the evaluation of innovative kinesitherapy procedures, with the aim of determining the optimal modalities of therapeutic exercise, with regard to the specificity of the exercise (different target orientations), the practitioners (age, health status, motor function, etc.), the conditions in which the therapy takes place (hospital, home care, etc.) and the technology used (computerization, virtual interfaces, etc.). KIFZG will also be in charge of creating and validating educational programs for trainers, authoring books, and organizing special conferences and academic courses.

State the research area(s) for which the Institution at which the project is to be implemented has been accredited.	Social sciences
Other	

Declaration:

The University of Zagreb, Faculty of Kinesiology, as the legal entity of the Applicant, declares its intention to ensure the successful implementation of the project by prof. Mario Baić, Ph.D. through the commitments stated below, in case the project proposal entitled **Strategy for the Development of Billiards as an Adaptive Sport (Para-billiards) Globally** is financed.

The Applicant's legal entity commits, throughout the duration of financing, to the following:

- Ensuring that the activities are conducted in a lawful manner and in accordance with the recommendations of the CSF and assuming all obligations arising from their implementation;
- Confirming that the Principal investigator is permanently employed or a member of the Croatian Academy of Sciences and Arts;
- Ensuring that the project activities are carried out under the scientific management of the Principal Investigator, who is expected to devote sufficient working hours to the proposed project
- Supporting the Principal Investigator with project management and providing him/her with adequate administrative assistance, especially with the processing and interpretation of financial information, financial management and financial reporting as well as with the general logistics of the project;
- Providing the Principal Investigator and his/her team members with support during research, in particular through infrastructure, equipment, products and other services required for research implementation
- Ensuring the necessary scientific autonomy of the Principal Investigator.

The Applicant's legal entity hereby declares the following: economic use is purely our ancillary activity, i.e. corresponds to the activity that is directly related to the work of the research organization or the research infrastructure and is essential for such work, or is inseparable from the main non-economic use and with limited scope. The capacities allocated to economic activities on an annual basis do not exceed 20% of the Institution's total annual capacities.

Applicant

Head of the Institution

(Official stamp)

HRZZ
Hrvatska zaklada za znanost

Administrative Form
Multilateral Academic Projects - MAPS (MAPS-2024)
MAPS-2024-1008

Project proposal number	MAPS-2024-1008	Project proposal acronym	SDBASG

1. Principal Investigator (PI) and Institution:

Name	Mario
Surname	Baić
E-mail address	mario.baic@kif.hr
Academic title	Scientific adviser
Are you currently a Principal Investigator and/or a research member of two or more projects funded by the Croatian Science Foundation ending after 31 October 2024?	No
Are you currently a Principal Investigator or a team member of an international project?	No
Institution	University of Zagreb, Faculty of Kinesiology
Institution street name and number	Horvaćanski zavoj 15
Postal code	10000
City	ZAGREB
Head of the Institution	prof. dr. sc. prof. dr. sc. Mario Baić
Phone	00385912549418; 0038513017922
Institution's main web page	www.kif.unizg.hr

2. Research group

User ID	Academic title	Name	Surname	Institution	E-mail	Status	Role
75e6dd92-4efe-4ef3-b400-f0aa431c6c80	Assistant	Damir	Pekas	University of Zagreb, Faculty of Kinesiology	damir.pekas@kif.hr	Researcher	Researcher

3. Swiss Principal Investigator

Name	Viktoriia
Surname	Nagorna
E-mail address	viktoriia.nagorna@baspo.admin.ch
Academic title	Asst. prof., docent
Institution (in English)	Swiss Federal Institute of Sport Magglingen
Institution address (street name and number)	Hauptstrasse, 247
Postal code	2532
City, Country	Magglingen
Telephone	+41584676253
Web page	www.baspo.admin.ch
Lead agency	Swiss Naional Science Foundation
Project duration (months)	48

4. Partner 3

Name	Vladimir
Surname	Potop
E-mail address	vladimir_potop@yahoo.com
Academic title	Professor
Institution (in English)	National University of Science and Technology
Institution address (street name and number)	Targun din Vale, 1
Postal code	110040
City, Country	Pitesti, Arges
Telephone	+40348453102
Web page	https://www.upit.ro/en/about-the-university
Partner agency	UEFISCDI

5. **Partner 4 (if applicable)**

Name	
Surname	
E-mail address	
Academic title	
Institution (in English)	
Institution address (street name and number)	
Postal code	
City, Country	
Telephone	
Web page	
Partner agency	

6. Partner 5 (if applicable)

Name	
Surname	
E-mail address	
Academic title	
Institution (in English)	
Institution address (street name and number)	
Postal code	
City, Country	
Telephone	
Web page	
Partner agency	

7. General information on project proposal

Call identifier	2024-MAPS-1008
Project proposal's full title in English language	Strategy for the Development of Billiards as an Adaptive Sport (Para-billiards) Globally
Project proposal's full title in Croatian language	Strategija razvoja biljara kao adaptivnog sporta (parabiljara) u svijetu
Project proposal acronym	SDBASG
Duration in months	48
Total requested grant from HRZZ (EUR)	368.124,00
Budget for Year 1 (EUR)	92.031,00
Budget for Year 2 (EUR)	92.031,00
Budget for Year 3 (EUR)	92.031,00
Budget for Year 4 (EUR)	92.031,00
Total budget requested from consortium (EUR)	368.124,00
Keywords *(min. 5 keywords)*	adaptive sports, musculoskeletal disorders, billiards, wheelchair athletes, Para-billiard
Scientific area *(Please choose only one)*	1 Natural sciences 2 Technological sciences 3 Biomedicine and Health 4 Biotechnical sciences 5 Social sciences 6 Humanities 7 Interdisciplinary project 8 Interdisciplinary scientific area
Please numerate the scientific area included in the Interdisciplinary project proposal (primary area should get number 1, next number 2, etc.)	0 Natural sciences 0 Technological sciences 3 Biomedicine and Health 4 Biotechnical sciences 2 Social sciences 1 Humanities
Scientific area by ERC classification	Life Sciences LS7 Diagnostic Tools, Therapies and Public Health: Aetiology, diagnosis and treatment of disease, public health, epidemiology, pharmacology, clinical medicine, regenerative medicine, medical ethics LS7_9 Public health and epidemiology
Scientific field	Kinesiology

Proposal summary (ENG)
(min. 100, max. 2000 characters)

The concept of adaptive sports, a powerful tool for social integration, has yet to embrace the potential of Para-billiards fully. Unlike other adaptive sports, Para-billiards, which include various cue sports like pool, snooker, and carom, offer a unique blend of strategy, precision, and camaraderie. This rich history and significant cultural presence worldwide make it a compelling choice for athletes with disabilities. However, its adaptation as a sport for these individuals still needs to be developed. This strategy aims to explore and promote the development of Para-billiards as an adaptive sport globally, enhancing inclusivity and providing competitive opportunities while preserving the heritage and spirit of the game. Our research aims to increase the integration of persons with musculoskeletal disorders into sports activities such as billiards by implementing innovative strategies and developments in the inclusive training and competitive process. To achieve the primary goal of our project, we plan to accomplish the following tasks: 1. Determine the most objective state of adaptive billiards at the international level; 2. To substantiate strategy for the development of billiards as an adaptive sport (Para-billiards) globally; 3. To prepare the official programs of educational and training sessions in billiards (pool) for persons with disorders of the musculoskeletal system; 4. To develop the official education programs for trainers who coach athletes with inclusions (adaptive billiards for example); 5. To define the level of influence of billiards training on the psycho-physiological condition of persons with disorders of a musculoskeletal system; 6. To define features of technical and tactical training of billiard players with disorders of the musculoskeletal system.

We, the undersigned, hereby declare under material and criminal liability the truthfulness and completeness of the information specified in the Administrative form, financial plan and the Work plan, and all the supporting documents. We confirm that we are familiar with the Normative Acts and Recommendations of the Croatian Science Foundation and with our signatures and official stamp, we undertake to comply with and accept their provisions.

With this signature and the official stamp, the Head of the Institution certifies that the project leader is permanently employed at the Institution where the project will be implemented, or is a full member of the Croatian Academy of Science and Arts. The Head of the Institution declares that the Principal Investigator will be able to devote sufficient working time to project funded by the HRZZ (CSF).

Principal Investigator

(Official stamp)

Head of the Institution

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Federal Department of Defence,
Civil Protection and Sport DDPS

Federal Office of Sport FOSPO
Swiss Feder Institute of Sport Magglingen SFISM

CH-Magglingen 2532 FOSPO;

POST CH AG

File reference: BASPO-
Magglingen, 2024

The commitment of the host institution for the MAPS project

To whom it may concern,

I am writing to express our institution's commitment to the MAPS project, specifically supporting the proposal entitled "**Strategy for the Development of Billiards as an Adaptive Sport (Para-billiards) Globally**," submitted by Dr. Nagorna Viktoriia.

The Federal Office of Sport FOSPO, Swiss Federal Institute of Sport Magglingen SFISM, as the applicant's legal entity, hereby confirms that we will uphold the obligations outlined below should the proposal mentioned above be retained:

Performance Obligations:
We commit to engaging Dr. Viktoriia Nagorna as the principal investigator for the grant, ensuring her compliance with eligibility requirements and personal responsibility for the approved project.
Applicant Eligibility:
Our institution ensures applicants meet the eligibility criteria defined in Article 4 and Article 5 of the RIPA, including research activity, employment status, project leadership capabilities, and access to necessary research infrastructure.

We affirm that SFISM will uphold these obligations and requirements and actively support the successful implementation of the proposed project.

Please do not hesitate to contact us for further information or clarification regarding our commitment.

Thank you for considering our institution's dedication to this vital endeavor.

Warm regards,

Maeder Urs IXLRJK
26.08.2024
Info: admin.ch/esignature | validator.ch

Urs Mäder,
Rector SFISM

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