

## **Opening Ceremony (29 oct - 09.00-09.30) – Institutional Addresses**

### **Session 1 (29 oct - 09.30-11.10) – Data Analytics, AI & Modeling for Sports**

- PATS: Proficiency-Aware Temporal Sampling for Multi-View Sports Skill Assessment (4)
- Graph-Based Unsupervised Temporal Segmentation of Diving Actions (10)
- UWB-Based Multiplayer Positioning System for Water Polo (36)
- Biomechanical-Phase Based Temporal Segmentation in Sports Videos (32)
- Assessment of 1m 105c Springboard Dive by ML Image Processing and IMU (38)

### **Session 2 (29 oct - 09.30-11.10) – Wearables, IoT & Physiological Monitoring**

- Real-Time Jump Activity Recognition and Jump Height Estimation Using IMU (3)
- Breaking the Game: Low-Cost 3D Human and Ball Pose Estimation in Basketball (16)
- Comparing IMU and Optical Motion Capture System for Sport Biomechanics (47)
- Evaluating Drift and Uncertainty in IMU-Based Bike Lean Angle Measurements (41)
- Real-Time Feedback for Simulated Nordic and Para Nordic Skiing (9)

### **Coffee Break (29 oct - 11.10-11.30)**

### **Keynote Lecture #1 (29 oct - 11.30-12.15)**

### **Keynote Lecture #2 (29 oct - 12.15-13.00)**

### **PANEL SESSION - Sport, Innovation and Technology (29 oct - 14:00 - 17:50) Where Research Meets Real-World Impact**

14:00 - Introduction

Federico Smanio (CEO Wylab) Paolo Bouquet (Università di Trento)

14:05 - Sport Reloaded: Technology for a Better Game. Exploring how innovation can reset the playing field - on and off the pitch

Francesco Rossi (Partner, CdP Venture Capital, Serial entrepreneur)

### **Part 1 - Beyond Sport: Enhancing Human Potential**

14:25 - Tech showcase

Margot Biasi (Microgate)

14:40 - Panel discussion “Training Better, Living Smarter: How new tech can revolutionize the sports and life Performance”

Lorenzo Bortolan (CERISM) - Gianpietro Beltramello (Gabel Tech) - Gabriele Santicchi (Soccerment)

### **Part 2 - Shared Innovation: New Alliances for the Future of Sport**

15:15 - Tech showcase

Pierluigi Bongiorno (MLA)

15:30 - Coffee Break

16:00 - Panel discussion “Breaking Barriers: When Startups and Sports Organizations Co-Create”  
Pietro Marini (Deltatre) - Mirko Clemente (Sportwig) - Giovanni Bertoli (WSF)

### **Part 3 - Technology Transfer in Sport: From Research to the Real World**

16:35 - Tech showcase  
Paolo Belluco (LWT3)

16:50 - Panel discussion “Science to Startup: can academic research play the real game?”  
Stefano Carosio (STAM) - Luca Fortini (Real Move) - Tommaso Rosi (LevelUp) -  
Francesco Rossi (CdP Venture)

### **Wrap Up**

17:25 - Fireside chat: Leading Through Change: Sport, Life and Legacy - A personal journey  
through transformation, innovation and reinvention  
Maria Laura Guardamagna (Avvocato, Arbitro UCI, Formatore della Formazione Olimpica  
CONI)

17:45 - Final remarks  
Federico Smanio (CEO Wylab) Paolo Bouquet (Università di Trento)

### **Session 3 (30 oct - 11.00-12.40) – Imaging, Multimedia & Extended Reality**

- Tracking Volleyball Players from a Multi-Camera Top-View Setup (13)
- Monocular Camera-Based System for Curling Strategy (20)
- Automatic Climbing Move Detection from Bouldering Videos (34)
- Reconstructing Velocity Profiles in Canoe Sprint Videos (33)
- A Human Activity Recognition Algorithm Using Three IMU-Based Units (19)

### **Session 4 (30 oct - 14.00-15.30) – Data Analytics, AI & Modeling for Sports**

- Multimodal Pass Receiver Prediction in Soccer with LLMs (7)
- Data-Driven Models for Predicting Player Market Value in European Football (15)
- Modelling Player Progression in Rugby Union: Premiership Attainment (48)
- Interpretable ML for Identifying Performance-Critical Flight Phases in Ski Flying (6)

### **Session 5 (30 oct - 16.00-17.30) – Data Analytics, AI & Modeling for Sports**

- Development of a Digital Curling AI with Deep Reinforcement Learning (27)
- Rotational Dynamics and Trajectory Prediction of Curling Stones (28)
- Real-Time Curling Trajectory Prediction with Attention Modeling (37)
- Input Encoding Strategies for Curling Score Prediction (43)
- Modelling Motor Competence Interdependencies: An XAI and Graph Analytics Approach (50)

## **Coffee Break (31 oct - 10.30-11.00)**

### **Session 6 (31 oct - 11.00-12.30) – Rehabilitation, Medicine & Assistive Tech**

- Monitoring Seasonal Changes in Jump Ability and Shoulder Strength in Volleyball (5)
- Knee and Ankle Kinematics in Snowboarding for Above-Knee Amputation (18)
- Front Kick Analysis in Kickboxing Athletes Using IMUs (29)
- Understanding Barriers: Exergame for ACL Rehabilitation (14)

### **Session 7 (31 oct - 11.00-12.30) – Imaging, Multimedia & Extended Reality**

- Experimental Analysis of Sub-GHz RF Communication for In-Water Wearables (8)
- Assessment of Swimming Technique and Performance of Paralympic Water Polo Athletes (17)
- AI Website to Recognize Hazards and Manage Risks in Outdoor Sports (2)
- Sound-Based Spin Estimation in Table Tennis (21)
- P-SPIN: Real-Time Feedback System for Table Tennis (24)

### **Session 8 (31 oct - 14.00-15.30) – Wearables, IoT & Physiological Monitoring**

- Time-Series Prediction of Toe Temperature Using LSTM (11)
- Optimizing Athletic Performance Through Personalized Sleep Monitoring (25)
- OptoSens: Optical Mask for Sleep Quality Monitoring (26)
- Assessing Inhaled Dose of Pollutants with Wearable Environmental Monitor (30)

### **Session 9 (31 oct - 14.00-15.30) – Rehabilitation, Medicine & Assistive Tech**

- Technological and Biomechanical Advances in Handcycling (12)
- VR Assessment of Auditory Spatial Perception in Blind Football Players (31)
- Motor and Cognitive Load Effects on Attention in Children: Dual-Task Study (42)
- Survey-Based Analysis of Habits Driving Success in Esports Athletes in MENA (1)

### **Session 10 (31 oct - 16.00-17.30) – Wearables, IoT & Physiological Monitoring**

- Graded Auxetic Lattices for Sports Impact Protection (45)
- Self-Powered Co-Harvesting for Batteryless Sensing in Two-Wheeled IoT (49)
- An E-Smart-Bike to Reduce Exposure to Air Pollutants (35)
- Monitoring the Autonomic Nervous System to Enhance  $\text{VO}_{2\text{max}}$  (44)

### **Session 11 (31 oct - 16.00-17.30) – Sport Management, Society & e-Sports**

- Cardiorespiratory and Biomechanical Adaptations to Rowing (22)
- Self-Administered Protocol for Rowing Motion Analysis on Ergometer (40)
- From IMUs to Smartwatches: Measuring Performance in Practical Shooting (23)

1. **Survey-Based Analysis of Habits Driving Success in Esports Athletes in the MENA Region** - Ibrahim Almansour and Lamia Alkwai (King Abdulaziz City for Science and Technology, Saudi Arabia); Latifah Aljafar and Aiman Noorwali (King Abdulaziz City for Science and Technology, Saudi Arabia)
2. **An Artificial Intelligence Website to Help Recognize Hazards, Manage Risks, and Evaluate Yourself in Outdoor Sports in Natural Environments** - Elisa Pichini Maini (INAIL - National Institute for Insurance on Accidents at Work, Italy & INAIL, Italy); Fabio Massimo Zanzotto and Elena Sofia Ruzzetti (University of Rome "Tor Vergata", Italy); Angelo Seneci (Outdoor Advisor, Italy); Angelo Rodio (University of Cassino and Southern Lazio, Italy); Laura Tomassini (INAIL, Italy)
3. **Real-Time Jump Activity Recognition and Jump Height Estimation Using IMU** - Maiva Schela Magnifouet Zefack (Icam Ouest, Cameroon); Jérôme Rocheteau (Icam Ouest, France & LS2N, France)
4. **PATS: Proficiency-Aware Temporal Sampling for Multi-View Sports Skill Assessment** - Edoardo Bianchi and Antonio Liotta (Free University of Bozen-Bolzano, Italy)
5. **Monitoring Seasonal Changes in Jump Ability and Shoulder Strength in Young Volleyball Players Across Age and Competitive Levels** - Claudia Brunetti, Pietro Maver, Filippo Bertozzi, Manuela Galli and Marco Tarabini (Politecnico di Milano, Italy)
6. **Interpretable Machine Learning for Identifying Performance-Critical Flight Phases in Ski Flying Using Wearable Sensor Data** - Lawrence Araa Odong and Paolo Bouquet (University of Trento, Italy)
7. **Multimodal Pass Receiver Prediction in Soccer with Large Language Models** - Tim Schlippe and Frederic Pieper (IU International University of Applied Sciences, Germany)
8. **Experimental Analysis of Sub-GHz RF Communication for in-Water Wearables in Swimming Applications** - Luca Borgianni (University of Pisa, Italy); Luca Boggioni and Lorenzo Monti (Cubit, Italy); Stefano Giordano, Sergio Saponara and Andrea Caiti (University of Pisa, Italy); Andrea Munafo (National Oceanography Centre, United Kingdom (Great Britain)); Marco Ottella (Xtremion Technology GmbH, Austria)
9. **Real-Time Feedback for Simulated Nordic and Para Nordic Skiing on a Treadmill: a New Training and Analysis Tool** - Jules Claudel (CeRiSM - University of Verona, Italy); Chiara Zoppirolli, Barbara Pellegrini, Federico Schena and Lorenzo Bortolan (University of Verona, Italy)
10. **Graph-Based Unsupervised Temporal Segmentation of Diving Actions** - Bikash Kumar Badatya and Vipul Baghel (Indian Institute of Technology Gandhinagar, India); Ravi Hegde (IIT Gandhinagar, India)
11. **Time-Series Prediction of Toe Temperature Using LSTM Networks and Physiological Feature Analysis** - Eleonora Bianca, Paolo Dabove, Gianluca Boccardo and Ada Ferri (Politecnico di Torino, Italy)
12. **Technological and Biomechanical Advances in Handcycling: a Multidisciplinary Perspective on Inclusive Sport Engineering** - Laura Gastaldi, Alessandro Di Gesù and Chiara Gastaldi (Politecnico di Torino, Italy)
13. **Tracking Volleyball Players from a Multi-Camera Top-View Setup** - Niccolò Bisagno, Giulia Martinelli and Nicola Conci (University of Trento, Italy)
14. **Understanding Barriers in Physical Engagement: Prototyping an Exergame for Anterior Cruciate Ligament Rehabilitation** - Luz Alejandra Magre Colorado (Dublin City University, Ireland & Universidad Tecnológica de Bolívar, Colombia); Sonal Santosh Baberwal (Dublin City University, Ireland); K. R. Sanjaya D. Gunawardhana (Dublin City University, Ireland & Insight SFI Centre for Data Analytics, Ireland); Kieran Moran (Maynooth University, Ireland); Shirley Coyle (Dublin City University, Ireland)
15. **Data-Driven Models for Predicting Field Player Market Value in European Football** - Mattias Sjögren (Linköping University, Sweden); Alex Jorge and Jesper Haglöf (Football Analytics Sweden AB, Sweden); Niklas Carlsson and Patrick Lambrix (Linköping University, Sweden)
16. **Breaking the Game: a Low-Cost System for 3D Human and Ball Pose Estimation in Basketball** - Giulia Martinelli, Niccolò Bisagno and Nicola Conci (University of Trento, Italy)
17. **Assessment of Swimming Technique and Performance of Paralympic Water Polo Athletes by a Gyroscope Device** - Lucio Caprioli (University of Rome Tor Vergata, Italy); Francesca Campoli (Sport Engineering Lab - University of Rome Tor Vergata, Italy); Leonardo Della Loggia (Sports Engineering Laboratory, Italy); Saeid Edriss (University of Rome Tor Vergata, Italy); Mario Giuliano and Antonella Galvan (FINP, Italy); Amani Najlaoui (Sports Engineering Laboratory, Italy); Eva Ruiz Martinez (Catalonian, Spain); Cristian Romagnoli (San Raffaele Rome University, Italy); Elvira Padua (San Raffaele Rome Open University, Italy); Giuseppe Annino and Vincenzo Bonaiuto (Tor Vergata University of Rome, Italy)
18. **Knee and Ankle Kinematics Evaluation in Snowboarding for People with Above-Knee Amputation** - Jules Olivié and Delphine Chadeaux (Université Sorbonne Paris Nord, France); Xavier Bonnet (Arts et Métiers Institute of Technology, France); Patricia Thoreux (Université Sorbonne Paris Nord, France)

19. **A Human Activity Recognition Algorithm Using Three Wearable IMU-Based Units** - Alessandra Angelucci, Fabrizio Lodi Rizzini, Alessandro Lori, Marco Mariani, Giovanni Mocetti, Gianluca Morotti, Pietro Maver, Marco Tarabini and Andrea Aliverti (Politecnico di Milano, Italy)
20. **Monocular Camera-Based System for Estimating Sweep Positions and Orientation to Enhance Curling Strategy** - Riku Hara (The University of Electro-Communications, Japan); Shimpei Aihara (Japan Institute of Sports Sciences, Japan); Takeshi Ito (The University of Electro-Communications, Japan)
21. **Sound-Based Spin Estimation in Table Tennis: Dataset and Real-Time Classification Pipeline** - Thomas Gossard, Julian Schmalzl, Andreas Ziegler and Andreas Zell (University of Tuebingen, Germany)
22. **Cardiorespiratory and Biomechanical Adaptations to Rowing: Implications for Athletic Performance** - Alessandra Isella, Camilla Previde Massara, Davide Marchesi, Sara Muttoni, Andrea Enrico Panzeri, Alice Viganò, Alessandra Angelucci, Claudia Brunetti, Francesco Iacomì, Pietro Maver, Pietro Massone, Edoardo M. Polo, Andrea Aliverti and Riccardo Barbieri (Politecnico di Milano, Italy)
23. **From IMUs to Smartwatches: Measuring Performance in Practical Shooting** - Gabriele Pancera and Massimiliano Micheli (University of Brescia, Italy); Stefano Morzenti (Fabbrica d'Armi P. Beretta S.p.A., Italy); Matteo Lancini (University of Brescia, Italy)
24. **Piezoelectric Sensor-Based Performance Indicator (P-SPIN): a Real-Time Feedback System for Table Tennis Training Performance** - Christian Angelo Dionlay and Lucky Angelico A Nagpala (University of the Philippines Los Baños, Philippines)
25. **Optimizing Athletic Performance Through Personalized Sleep Monitoring** - Susanna Bardini, Francesca Biondi, Beatrice Campo, Benedetta Di Sarno and Leo Valentino Crippa (Politecnico di Milano, Italy); Marco D Santambrogio (Politecnico di Milano & MIT, Italy)
26. **OptoSens: an Optical Sensor Based Mask for Sleep Quality Monitoring** - Susanna Bardini and Mirko Salaris (Politecnico di Milano, Italy); Marco D Santambrogio (Politecnico di Milano & MIT, Italy)
27. **Development of a Digital Curling AI Using Deep Reinforcement Learning and SHOT Search** - Itsuki Kurata and Tomomichi Kanaeda (The University of Electro-Communications, Japan); Shimpei Aihara (Japan Institute of Sports Sciences, Japan); Takeshi Ito (The University of Electro-Communications, Japan)
28. **Rotational Dynamics and Trajectory Prediction of Curling Stones Using Machine Learning Techniques** - Sampath Kumar Reddy Gondesi and Fumito Masui (Kitami Institute of Technology, Japan); Shimpei Aihara (Japan Institute of Sports Sciences, Japan); Michal Ptaszynski (Kitami Institute of Technology, Japan)
29. **Front Kick Analysis in Kickboxing Athletes Using IMUs: a Pilot Study** - Giorgia Palotti (Politecnico di Milano, Italy & INAIL, Italy); Michele Brambilla (Politecnico di Milano, Italy); Cristina Chieffo (Politecnico di Milano, Italy & INAIL, Italy); Filippo Motta, Marco Tarabini and Manuela Galli (Politecnico di Milano, Italy)
30. **Assessing Inhaled Dose of Pollutants Across Activities and Environments Using a Wearable Environmental Monitor: a Pilot Study** - Sara Bernasconi, Alessandra Angelucci, Marco Banfi and Andrea Aliverti (Politecnico di Milano, Italy)
31. **Virtual Reality Assessment of Auditory Spatial Perception and Navigation in Blind Football Players** - Yuta Ochiai (Waseda University, Japan); Ayumu Tsuji (Waseda University, Japan); Shimpei Aihara (Japan Institute of Sports Sciences, Japan); Hiroyasu Iwata (Waseda University, Japan)
32. **Biomechanical-Phase Based Temporal Segmentation in Sports Videos: a Demonstration on Javelin-Throw** - Bikash Kumar Badatya and Vipul Baghel (Indian Institute of Technology Gandhinagar, India); Jyotimoy Amin (IISER Berhampur, India); Ravi Hegde (IIT Gandhinagar, India)
33. **Reconstructing Velocity Profiles Using Scene Geometry in Panned and Zoomed Canoe Sprint Videos** - Daniel Matthes, Patrick Frenzel and Julian Ziegler (Leipzig University of Applied Sciences, Germany); Torsten Warnke (Institute for Applied Training Science (IAT), Germany); Tina Kövari (German Canoe Federation, Germany); Mirco Fuchs (Leipzig University of Applied Sciences, Germany)
34. **Automatic Climbing Move Detection from Fixed-Camera Bouldering Videos Using Pose and Image Features** - Keita Kimura and Yasumasa Tamura (Hokkaido University, Japan); Shimpei Aihara (Japan Institute of Sports Sciences, Japan); Masahito Yamamoto (Hokkaido University, Japan)
35. **An E-Smart-Bike to Reduce Exposure to Air Pollutants While Maximizing the Benefits of Physical Activity** - Alberto Bonardi and Roberto Zanotti (University of Brescia, Italy); Francesco Negro (Università Degli Studi di Brescia, Italy); Danilo Iannetta (University of Brescia, Italy)
36. **UWB-Based Multiplayer Positioning System for Water Polo** - Florent Cotton (Samovar, Télécom SudParis, Institut Polytechnique de Paris, France & Efrei Research Lab, France); Laurie Contevelle (Efrei Paris, France); Elizabeth Colin (EFREI Paris, France); Wegrzyn-Wolska Katarzyna (EFREI PARIS, France)

37. **Real-Time Curling Trajectory Prediction via Attention-Enhanced Sequential Modeling and Multi-Dimensional Feature Fusion** - Guanyu Chen (Future University Hakodate, Japan); Shimpei Aihara (Japan Institute of Sports Sciences, Japan); Yoshinari Takegawa (Future University Hakodate, Japan)
38. **Assessment of 1m 105c Springboard Dive by Machine Learning Image Processing and an Inertial Measurement Unit** - Andrea Zanela (ENEA, Italy); Aatheethyaa Dhanasekaran (Sports Engineering Lab, University of Rome Tor Vergata, Italy); Lucio Caprioli (University of Rome Tor Vergata, Italy); Manuele Scifoni (Sports Engineering Lab, University of Rome Tor Vergata, Italy); Flavio Centurioni (Sports Engineering Lab Dept. Industrial Eng. University of Rome Tor Vergata, Italy); Vincenzo Bonaiuto (Tor Vergata University of Rome, Italy)
39. **Self-Administered Protocol for Rowing Motion Analysis on the Ergometer** - Silvia Crosio, Valerio Cornagliotto, Laura Gastaldi and Stefano Pastorelli (Politecnico di Torino, Italy)
40. **Evaluating Drift and Uncertainty in IMU-Based Bike and Rider Lean Angle Measurements During Downhill Mountain Biking** - Dave Hanegraaf (University of Groningen, The Netherlands & DSMC, University of Brescia, Italy); Enrico Ferlinghetti (University of Brescia, Italy & University of Groningen, The Netherlands); Matteo Lancini (University of Brescia, Italy)
41. **Motor and Cognitive Load Effects on Attention in School-Aged Children: a Dual-Task Study Using Digital Assessment** - Alice Montelaghi (Free University of Bozen-Bolzano, Italy & University of Verona, Italy); Marta Duina, Antonino Mulè and Attilio Carraro (Free University of Bozen-Bolzano, Italy)
42. **Input Encoding and Data Construction Strategies for Accurate Expected Score Distribution Prediction in Digital Curling** - Rintaro Chiba and Yasumasa Tamura (Hokkaido University, Japan); Shimpei Aihara (Japan Institute of Sports Sciences, Japan); Masahito Yamamoto (Hokkaido University, Japan)
43. **Monitoring the Autonomic Nervous System to Enhance VO<sub>2</sub>max: Mechanisms and Future Directions** - Mince Alaedine and Laurent Mourot (Université Marie et Louis Pasteur, France)
44. **Graded Auxetic Lattices for Sports Impact Protection: Experimental Validation and Predictive Modeling** - Seyedkamal Jalali (University of Trento, Italy); Mahmood Heshmati (Kermanshah University of Technology, Iran); Mariafederica Parisi, Daniel Colombo and Martino Colonna (Università di Bologna, Italy); Nicola Pugno (University of Trento, Italy)
45. **Comparing IMU and Optical Motion Capture System for Sport Biomechanics: Static and Dynamic Analysis** - Damiano Fruet, Arianna Tauro and Dalia Di Liberto (University of Trento, Italy); Chiara Pedrotti (University of Pisa, Italy); Ilaria Bracci (Lincotek, Italy); Giandomenico Nollo (University of Trento, Italy)
46. **Modelling Player Progression in Rugby Union: a Data-Driven Approach to Premiership Attainment** - Asma Slaimi, Amy Shelley, Áine Macnamara, Jamie Taylor, Stephen Behan and Michael Scriney (Dublin City University, Ireland)
47. **Self-Powered Co-Harvesting for Batteryless Sensing and Monitoring in Two-Wheeled IoT Applications** - Giuseppe Pasquini, Davide Brunelli and Maria Doglioni (University of Trento, Italy)
48. **Modelling Motor Competence Interdependencies: An XAI and Graph Analytics Approach** Colm O'Donoghue, Michael Scriney, Sarahjane Belton, Stephen Behan