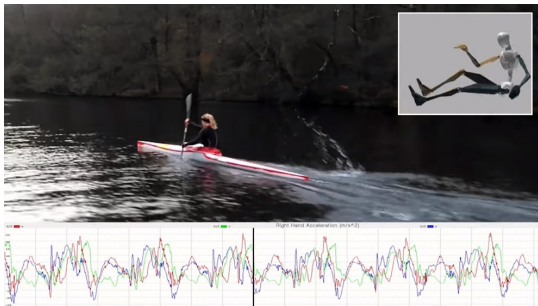


Collaborations

Aalborg Hospital, Gävle University, German Sport University Cologne, Karolinska Institutet, Lillehammer University College, Mc Gill University, National Research Centre for the Working Environment, The Hong Kong Polytechnic University, Norwegian School of Sport Sciences, Syddansk Universitet, Technical university of Munich, University School of Physical Education Wrocław, Université de Grenoble Alpes, Universidad Rey Juan Carlos, University College North Jutland, Universidade Federal de São Carlos, University of Auckland, University of Southampton, Universidad Granada, Århus University, Copenhagen University, University of Jyväskylä.



Affiliated institution of the European College of Sports Science

Innovation

Collaboration

with a number of private companies, e.g. Active Sportswear, Alectia, Anybody, AaB A/S, Brooks, DJO Nordic, DSB, Dansk Boldspil Union, Dansk Håndbold Forbund, Ecco, Ergomat, Footbalance, Grontmij | Carl Bro A/S, HedeDanmark, Medicovi, Meyland— Smith, Newline, Ortopædkirurgisk speciallægepraksis v. Søren Kaalund, Sahva, SAS, Scaniro, Sports Pharma, Spraino.

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As well as approx. 15 PhD students.

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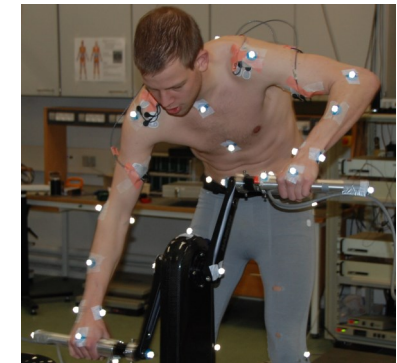


2017-11-13



DEPARTMENT OF HEALTH
SCIENCE AND TECHNOLOGY
AALBORG UNIVERSITY

Physical activity and Human performance



Objectives:

To study and analyze fundamental influences of physical work and exercise on the organization of human movement, motor control, metabolism and musculo-skeletal loading patterns.



Research group on Physical activity and Human performance

Homepage:

<http://www.smi.hst.aau.dk/research/rigs/physical-activity-and-human-performance/>

Objectives:

Our main activities aim at **optimizing performance** in sports and at work, to **prevent musculoskeletal overload and injury** and to **optimize rehabilitation** after injury. The research areas cover **humanities, social & natural sciences**.

Research areas:

The research is focused on two axes:

- Research within humanities & social sciences focusing on recognized **cultures in sport clubs**, transitional changes for **talented athletes** as well as body and mind connections in **physical learning activities**.
- Research within natural sciences contributing to the basic **understanding of neuromuscular, physiological and biomechanical adaptations to physical activity**.

A special focus lies on the development and application of research methods for innovative research in sports, exercise physiology, biomechanics & ergonomics. The goal is to apply and develop basic knowledge to enhance athletes/workers motor skills for improving performance and preventing injuries. An important part of this effort is dedicated to improvement of training modalities and equipment in parallel with the technological development.

The Physical Activity and Human Performance group consists of specialists from **Biomechanics, Coaching, Engineering, Ergonomics, Physiology, Physiotherapy and Sport Sciences**. The interdisciplinary character of the group enables us to holistically approach applied as well as fundamental research questions.

Fundamental areas:

- Control of movement, role of afferent feedback in movement generation and balance control
- Development of new models to investigate biological adaptation to loading and training
- Novel concepts of linking physiological and mechanical responses
- Cultures, learning and talent development in relation to sports and physical activities



Methods and instrumentation:

Observations, interviews, and questionnaires as well as subjective assessment of perceived exertion, stress and pain. Objective Physiological assessments: Oxygen consumption, blood lactate, ECG, eye tracking, SEMG, mechanomyography, transcranial magnetic stimulation and reflex assessment by advanced perturbators. Kinetic measurements, force transducers, force platforms, pressure sensitive devices. Kinematics: accelerometers, gyroscopes, goniometers, 2D/3D recordings, musculo-skeletal models, Sensors and equipment for *in-situ* data collection.

Educational programs:

- Sports Science and Sports Technology**
- Biomedical Engineering and Informatics**
- Clinical Science and Technology**
- Industrial Medicine, Medicine**
- Product Design and Psychology**
- International doctoral School in Biomedical Science and Engineering**
- Post doctoral opportunities**

Topics:

- Sport science
- Exercise physiology
- Physical activity
- Measurement techniques
- Man-machine interaction
- Biomechanics
- Data processing
- Musculo-skeletal modelling
- Ergonomics

Application fields:

- Work-related musculoskeletal pain
- Risk factors for sports injury
- Training programs
- Short /long term tissue reactions to interventions/training
- Clinical gait analysis
- Work-place and tools assessments and design

Laboratories:

- Laboratory for Applied Exercise Physiology and Metabolism
- Laboratory for Integrative Physiology
- Laboratory for Neuromechanics and Exercise
- Laboratory for Ergonomics and Work-related Disorders
- Laboratory for Motor Behaviour and Performance
- Laboratory for Movement Dynamics and Sport Technology
- Laboratory for Qualitative Studies of Physical Activity
- Laboratory for Musculoskeletal Modeling