



Bern University
of Applied Sciences



Institute for Rehabilitation and Performance Technology IRPT

«We combine advanced technology with methods from performance sports in order to optimize the rehabilitation process. We are helping people to realize their full potential.»

Prof. Dr. Kenneth Hunt, Head of IRPT



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The Institute for Rehabilitation and Performance Technology IRPT is member of BFH-Centre for Technologies in Sports and Medicine

Our research projects are carried out hand-in-hand with industry partners and with leading neurological rehabilitation clinics. Our work is highly interdisciplinary. We develop new products for industry and clinical applications.

Core Competences

- Cardiopulmonary and musculoskeletal rehabilitation
- Neurological adaptation and recovery
- Rehabilitation robotics
- Novel drivetrains for cycling systems
- Functional electrical stimulation
- Micro- and whole-body vibration
- Treadmill automation
- Cardiopulmonary training and testing protocols
- Feedback control and signal processing

We apply our broad core-competences in basic research work, industrial development projects and in clinical application studies.

Team

Currently around 15 people are members of the IRPT. The team consists of several research assistants, PhD students, postdocs, and a group of Bachelor and Master project students.

Research Groups

Rehabilitation engineering: We develop new technical devices and extend the functionality of existing products. These are applied in clinical settings to rehabilitate people with various neurological problems, including stroke and spinal cord injury.

Sports engineering: Our work is focusing on advanced feedback control methods for treadmill automation. This allows exercise intensity to be specified for training and testing purposes, using heart rate, oxygen uptake or metabolic work rate. We also develop high-precision positioning algorithms. Applications are available for walking, running and cycling on a treadmill.

Specialities

The IRPT closely collaborates with renowned rehabilitation clinics in Switzerland. In early 2011 we started formal research collaboration with the clinic Reha Rheinfelden near Basel. The primary focus is on rehabilitation of people who have suffered a stroke. We also collaborate with the Swiss Paraplegic Centre in Nottwil on research involving people with a spinal cord injury. Industrial partners include Hocoma AG in the field of rehabilitation robotics, and h/p/cosmos GmbH, a manufacturer of high-end treadmills.

IRPT has an excellent research infrastructure including a dedicated research lab within the Reha Rheinfelden. Robotics-assisted devices include a treadmill (Lokomat) and tilt table (Erigo) by Hocoma. We also have modern cardiorespiratory monitoring systems and a high-performance treadmill (h/p/cosmos Venus).

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