

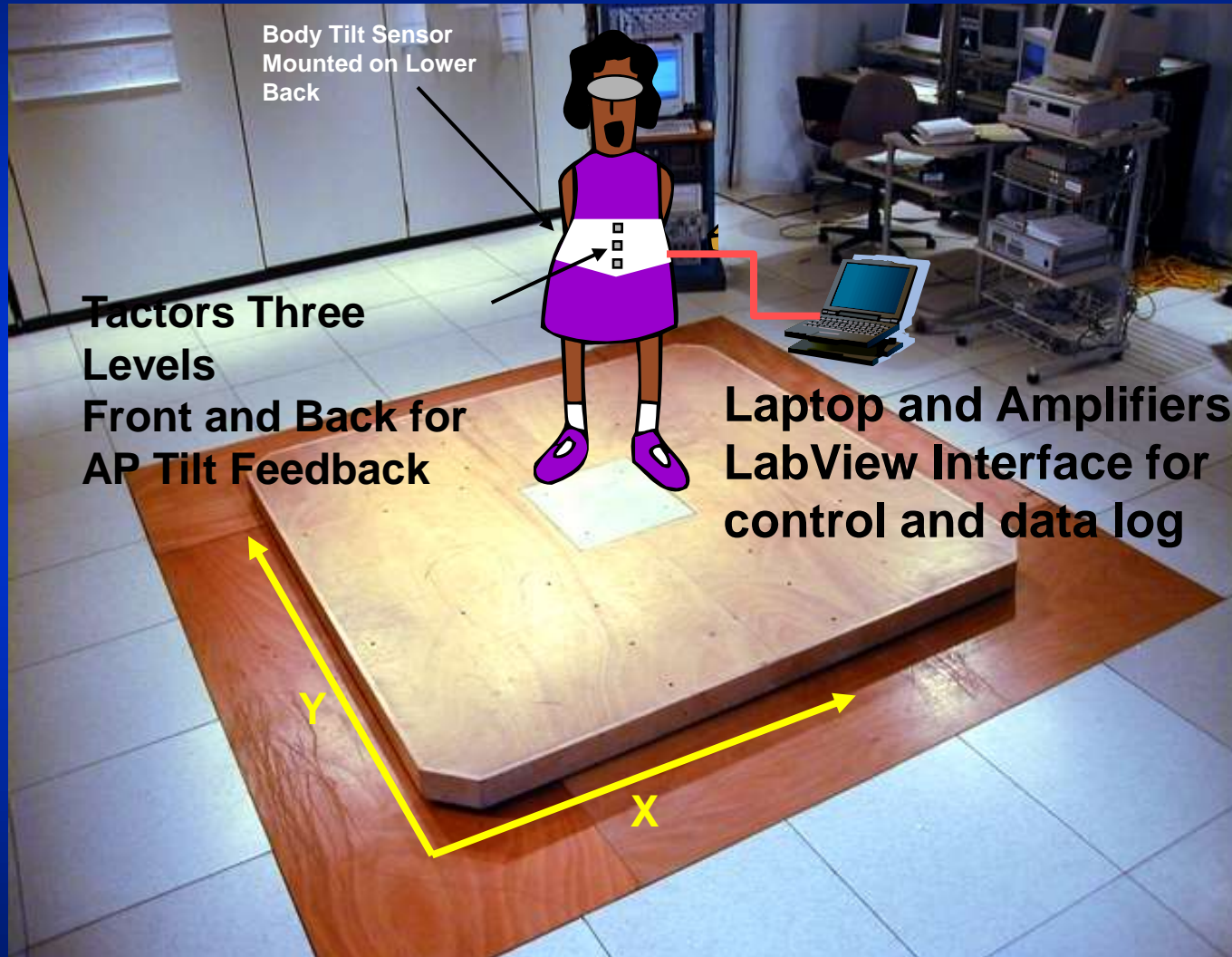
Bridging Mechatronics and Biomedical Engineering in an Educational Research Environment

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RESEARCH - EXAMPLE PROJECTS

Testing Balance Prosthetic on the BALDER Balance Platform



PROJECT REVIEW - THESES

BALDERINA - an inverted pendulum model for real time balance

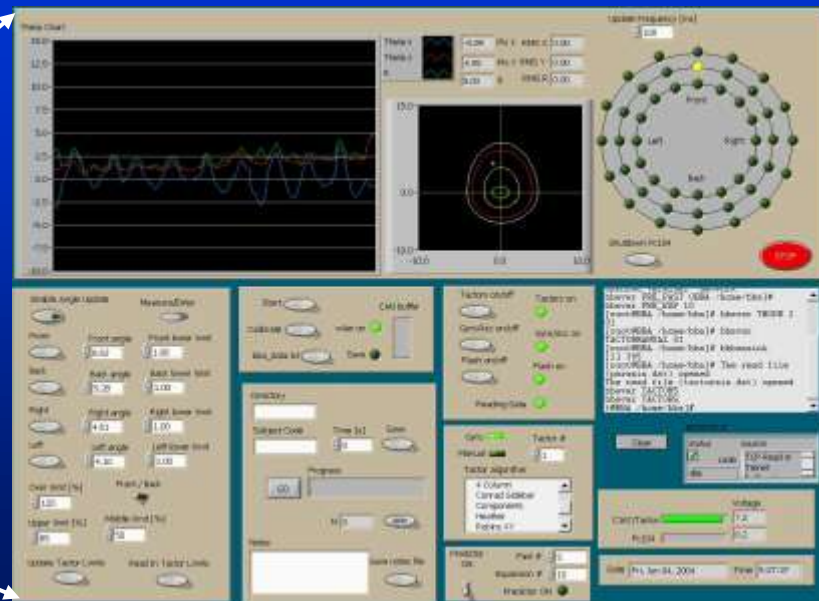


RESEARCH - EXAMPLE PROJECTS

Wearable Balance Prosthetic Device Prototype

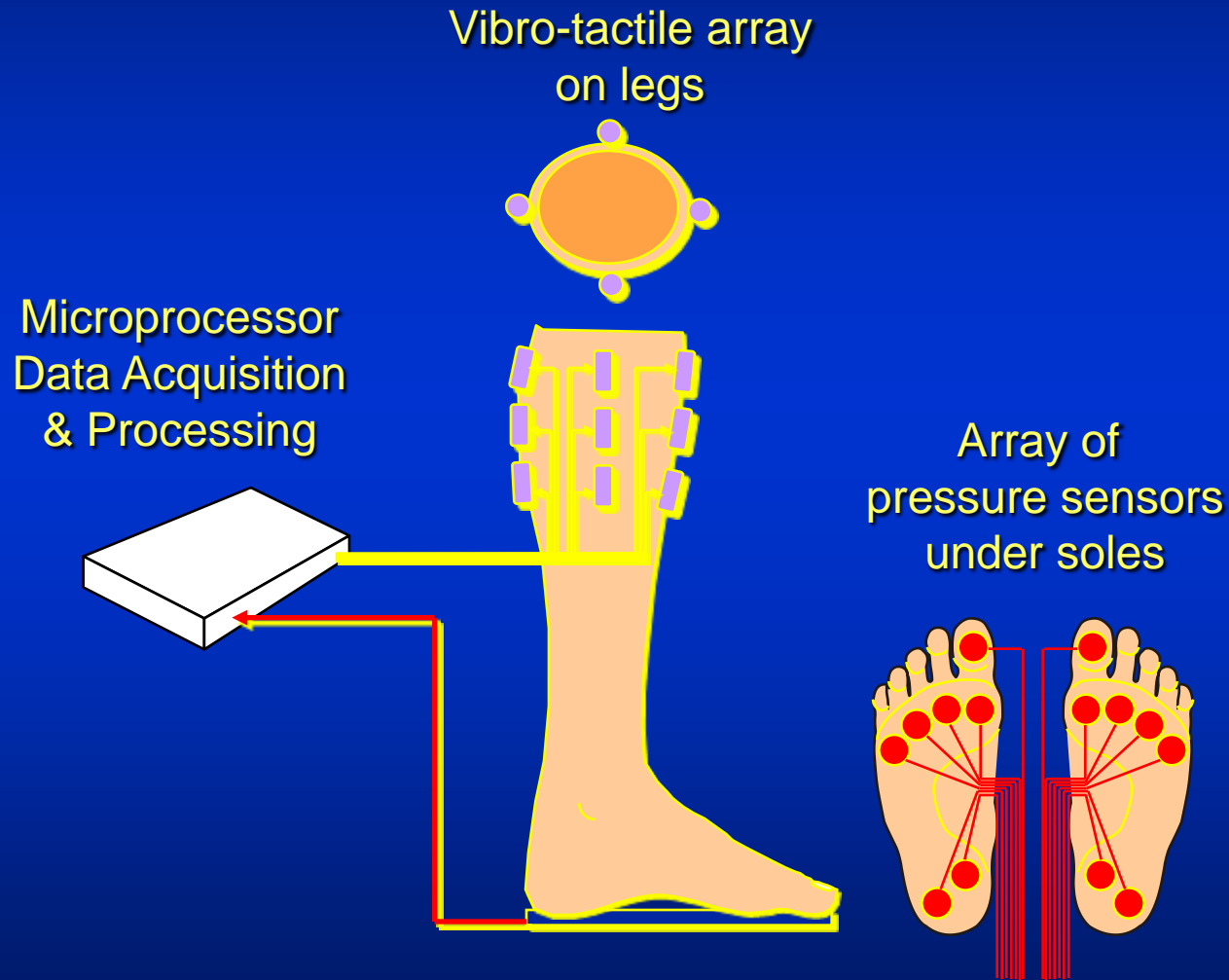
(NIH Study w Dr. C. Wall, PI @ MEEI)

- **PC 104 system**
- **CAN bus communication**
- **Wi-Fi communication**
- **Logging of data, tilt & tactors**
- **FDA approved Tactors (3x16=48)**
- **LabVIEW National Instruments**
- **Battery Powered (~2 hours)**



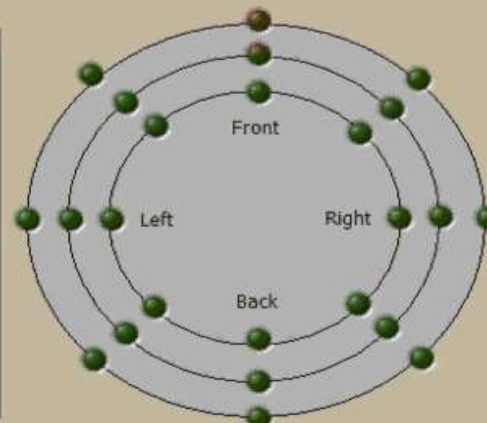
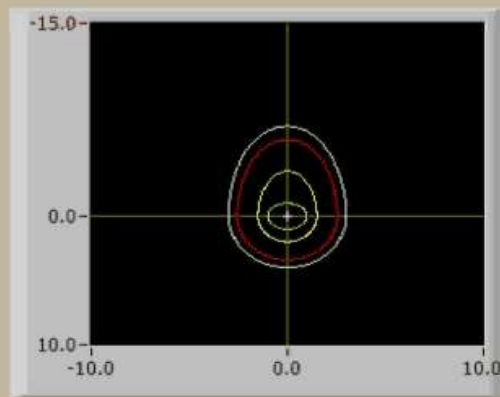
RESEARCH - EXAMPLE PROJECTS

Prosthetic Foot Sole System



LabVIEW

Wearable Balance Prosthetic Device Prototype



KTH Mechatronics, Advanced Course

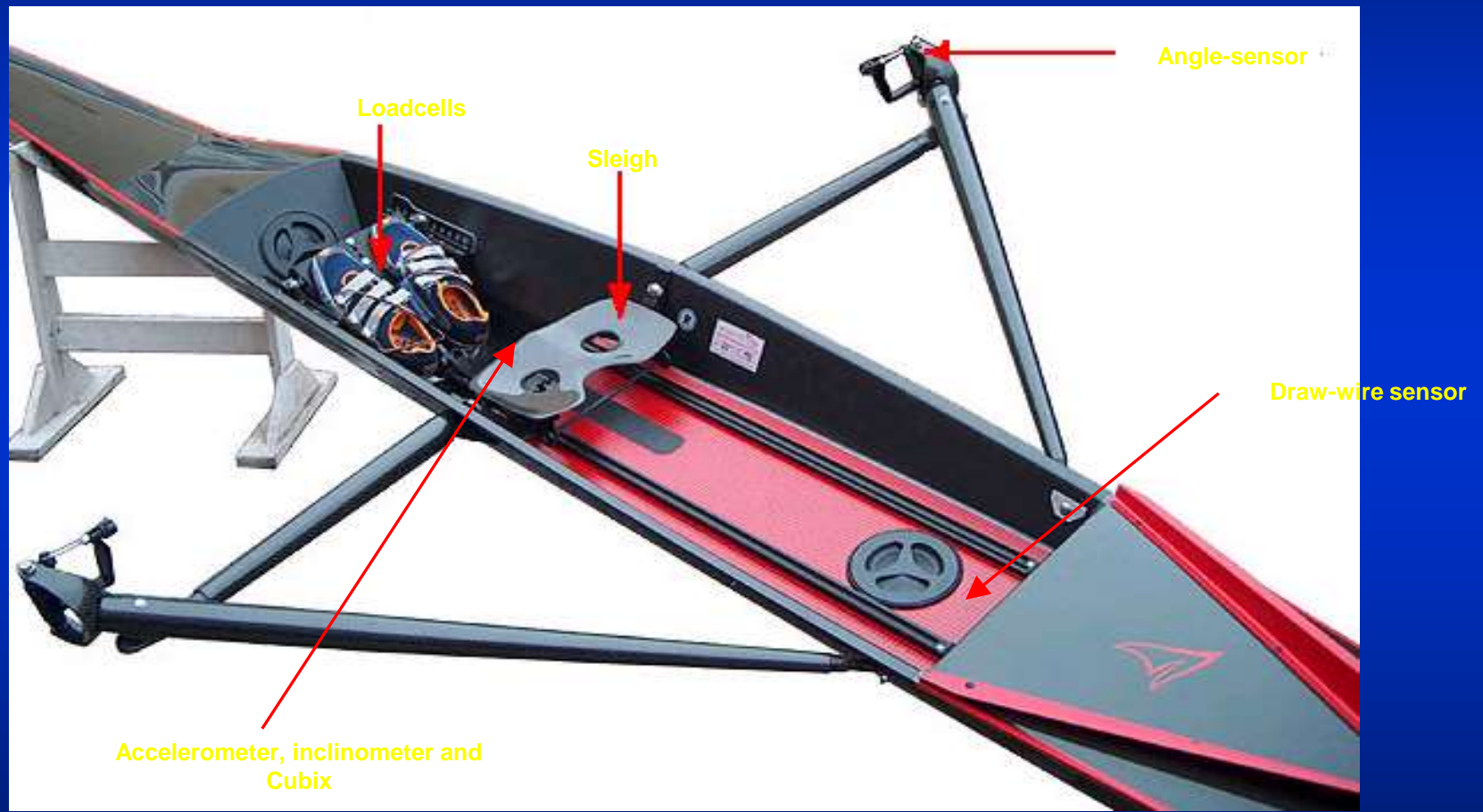
SOAP | System for Optimizing Athletic Performance

For more information visit: www.i.kth.se/u1cd1dgm

What is SOAP?

- Collaboration between University College of Physical Education and Sports (IHS) and Royal Institute of Technology (KTH).
- Goal: Create a feedback-system for elite rowers with the purpose of optimizing their motion pattern.
- Realization: collect data from a number of sensors in a row boat and present these results to the rower and coach for further analysis.
- A helpful tool for the Swedish Rowing Federation and Swedish elite rowers on their way to Beijing 2008.

Prototype



The Concept



Loadcells

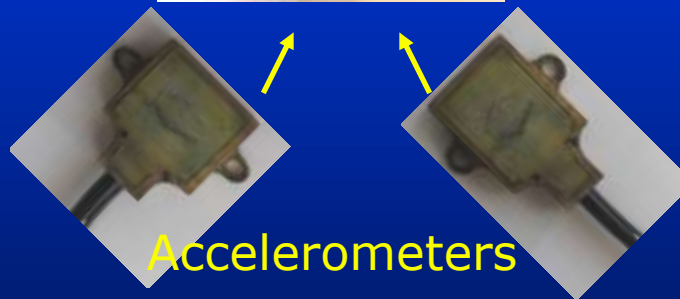
Inclinometer



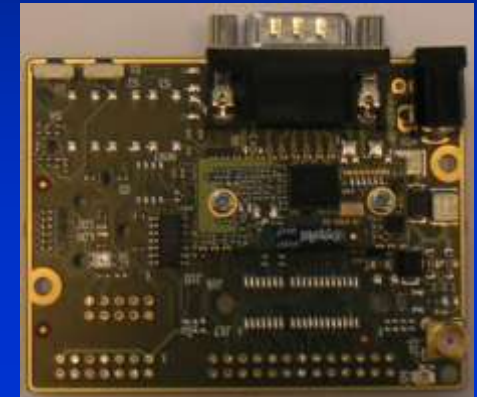
Draw-wire sensor



Cubix



Accelerometers



Bluetooth

Angle sensor



Sensors

- Accelerometers (2) to detect acceleration in two directions.
- Angle-sensor to measure oar's angle (wireless communication through Bluetooth).
- Inclinometer to measure the inclination of the boat.
- Loadcells (2) to measure force exerted by the feet.
- Draw-wire sensor to measure the position of sleigh.

Cubix Microcontroller and Bluetooth

Microcontroller

- **Microcontroller – Cubix – from National Instruments.**
- **Programming language: LabVIEW 7.1.**
- **Module-based microcontroller where each layer corresponds to a specific function.**
- **Collects data from six sensors through a multiplexer.**
- **Collects data from an angle-sensor through Bluetooth.**
- **Reads and writes data 65 times per second and sensor onto a Multimedia-card.**

Bluetooth

- **Bluetooth development kit from ConnectBlue.**
- **Programmed with the help of AT-commands in Hyperterminal.**
- **Used to send pulses from angle-sensor.**
- **Third generation BT – faster transmission rate.**

More examples

- Please visit our website

<http://www.md.kth.se/edu/mda/index.shtml>

And for projects

<http://www.md.kth.se/mip/>

Thank you for your attention.



Lars-94

