Week 10

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Announcement

Upcoming Important Dates:

• Final poster: due Nov. 29 (sent for print);

Organize all the files related to the project, upload to the Onedrive





Criteria (Max score)			Group		
	1	2	3	4	5
Cohesive Scenario (10)					
Clear motivation and communication for the need of the product (10)					
Concept novelty (20)					
Maturity of the prototype (10)					
Application of novel technology (20)					
Poster (content and design) (20)					
Videos and other visual aids to communicate better the concept and working principle (10)					
Sum (100)					



Robotics Lab

Rowing smart equipmen

A rowing boat simulator

that simulates water

instability, and allows f

resistance and boat

pace monitoring.

Reconfigurable

Motivation

- Why your project matters?
- What makes your approach novel?
- Strength?

Performance

- Actual testing data from prototype, Not expectations;
- Enhance the readability of the plot/table.

Design

- Highlight how your design helped improve the performance;
- Justify the design/selection;

Summary

- Cons and Pros;
- Future work;

ME-410: Mechanical Product **Design & Development**

SynchRower

Juliette Hars, Victor Legendre, Soheil Nasiri, Gaston Wolfart, Matthieu Gachet Reconfigurable Robotics Lab, EPFL, Lausanne, Switzerland

Motivation

For efficient rowing, all crew members need to be perfectly in sync. The usual technique to achieve this is by visually imitating and feeling the movement of the person in front.

Our goal is to improve the synchronisation of the crew by leveraging haptic feedback and muscle memory training, which were shown by previous works [1][2] to have an important

Additionally, our device will allow each crew member to synchronize with the leader directly instead of with the person in front, thus avoiding delay and loss in performance.



Riorower

State-of-the-art

An actuated knee

walking assistance

articulation for

with a control

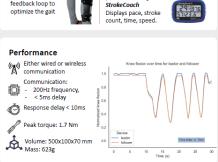
feedback loop to

Orthofiga



adjustable by the user. The motor at the interface of the two segments rotates and drive:

the leg towards the angle setpoint provided by the leader.



Summary and Future Development

Our device enables the rowers to get a fast feedback response to help them row in sync. Indeed, we have shown that the delay is short enough (< 10ms)

Nevertheless, it would be relevant to do a more thorough dynamic analysis to assess the full capabilities of our device.

It would also be interesting to conduct a study to evaluate how much impact our device has on the training of rowers in real-life conditions.

Achieved	Further improvements
Working proof of concept	Waterproofing
Easy and simple interface	Include battery
Great compliance thanks to the 5 passive DOFs	Synchronize more than 2 rowers



[1] Signist, R., Rauter, G., Marchal-Crespo, L. et al. Sonification and haptic feedback in addition to visual feedback enhances co.

[2] Roland Signist roland.signist@hest.ethz.ch , Georg Rauter , Robert Riener & Peter Wolf (2013) Terminal Feedback Outperforms Concurre.





Next Week

- 2nd Mock demo presentation;
- Poster ready for print;