Joined Seminar M^3

Joined interdisciplinary Seminar offers a unique possibility to glance at research questions, methods, and results from three research labs in Baden-Württemberg. The guiding question for the seminar is: *How are biological and technical movements generated and controlled?* You will get insights into this interdisciplinary field through provided overview on different aspects like: recording and analysis of human movement, reduced biomechanical models, neuro-musculo-skeletal models, humanoid robotics, control of complex human-like movements and machine learning. The interaction of these approaches offers new possibilities and opens new research focus areas.

We will discuss examples from the industry (passenger safety in cars, tool design, ergonomics), in medical engineering (prosthetics, orthotics, rehabilitation robotics), Human-Robot interaction and imitation learning.

Participating in the seminar will allow you to visit the labs, listen to presentations of researchers at each institution, take part in a small research project in a field of your choice, and to get in contact with students and researchers in this interdisciplinary field.

You are more than welcome to join us!

"Motions in Man and Machine" Seminar 2018

Organizer	Syn Schmitt (Uni Stuttgart)
Co-Organizers	Andre Seyfarth (TU Darmstadt), Jan Peters (TU Darmstadt), Tamim Asfour (KIT Karlsruhe)

Modalities

Students are required to:

- participate in the three seminar days
- work in groups on one project for four weeks
- create a wiki project report with a podcast video **deadline: Saturday 11.06.2016**

Agenda

Wednesday, 11.05.2016, Karlsruhe

Location	Adenauerring 2 (Gebäude 50.20), 76131 Karlsruhe
Web site	http://h2t.anthropomatik.kit.edu/530.php

- 10:00 Tamim Asfour: Start of the Seminar and Introduction
- 10:30 Tamim Asfour: Humanoid Robotics Research
- 12:00 Lunch
- 13:00 Presentation of the project topics with „hands on“ examples
- 15:30 Conclusion

project topics	projektthemen_karlsruhe_2016.pdf
slides	2016-m3-seminar-h2t_kit.pdf

Thursday, 12.05.2016, Stuttgart

Location	Allmandring 28, Sports Institute, Room U 109
Web site	http://www.inspo.uni-stuttgart.de/hms
Note:	**Please bring a Laptop with Matlab/Simulink (including SimMechanics Toolbox).**

- 10:45 PART I
  - Jun.-Prof. Dr. Syn Schmitt: Human Motion Research
  - Dr. Daniel Haeufle: Modeling and simulation of musculo-skeletal movements
  - Prof. Karl Kalveram: Control of human arm movements
- 12:30 Lunch
- 13:30 Part II new Location: SimTech Building Pfaffenwaldring 5a map
  - Dr. Oleksandr Martynenko: Active human models for applications in ergonomics and safety
  - Prof. Karl Kalveram: How to test theories on human movement control?
  - Dr. Daniel Häufle: Demo - Musculo-skeletal Models in Simulink/Simmechanics

Slides

Friday, 13.05.2016, Darmstadt

Location Part I	Gebäude S110, Raum 211, Magdalenenstraße 2, 64289 Darmstadt Interaktive Karte ACHTUNG: Besonderer Zugang zum Raum
Location Part II	Gebäude S115, Raum 30, Alexanderstraße 10, 64289 Darmstadt Interaktive Karte
Slides:	Download
Web site	www.lauflabor.de

- 10:30 Start of the Seminar and Introduction
- 10:45 PART I: Presentations and projects
  - Andre Seyfarth
  - Karl Kalveram: On Systems that Generate Behavior Slides
  - Guoping Zhao
  - Projects
- 12:30 Lunch
- 13:30 PART II:
  - 13:30 - 14:30 Locomotion Lab Demo
  - 14:30 - 15:00 EMK Lab Demo
- 15:00 Conclusion

Project proposals

Projects offered by KIT	Contact	Main Location
Human Motion Capturing & Character Animation I	Ömer Terlemez & Michael Bechtel	Karlsruhe
Human Motion Capturing & Character Animation II	Ömer Terlemez & Michael Bechtel	Karlsruhe
Segmentation of Human Whole-Body Motion	You Zhou & Christian Mandery	Karlsruhe
Learning and Parameterization of Motion Primitives from Human Observation	Mirko Wächter	Karlsruhe

If you are interested in one of our project topics, please contact the respective supervisor(s) to schedule a date!
Ömer Terlemez
Michael Bechtel
You Zhou
Christian Mandery
Mirko Wächter

Important message to the students from Stuttgart who signed up for Human Motion Capturing & Character Animation I: We don't have your mail adresses! Please contact us as soon as possible so we can schedule the lab day in Karlsruhe!

Projects offered by TU Darmstadt on Friday	Contact	Main location
Auto-imitative re-learning of the inverse arm-dynamics on a changed load	K. Kalveram	TU Darmstadt
Adaptation to a changed geometry of the tool	K. Kalveram	TU Darmstadt
Simulated drilling or polishing	K. Kalveram	TU Darmstadt
Concurrent-cooperative force control	K. Kalveram	TU Darmstadt
Utilization of Kinect and Balance Board for Capturing and Analyzing of Human Locomotion (Slides)	C. Schumacher	TU Darmstadt
Investigation of asymmetric Gait Pattern Adaptations for Walking with a constrained Ankle (Slides)	C. Schumacher	TU Darmstadt

If you are interested in one of our project topics, please contact the respective supervisor(s) to schedule a date!
Karl Kalveram
Christian Schumacher

Projects offered by Uni Stuttgart on Thursday	Contact	Main location
Musculo-Skeletal modeling: human arm movement control for cyclic motions	D. Häufle	U Stuttgart
Musculo-Skeletal modeling: human arm movement control for goal directed movements	D. Häufle	U Stuttgart
Musculo-Skeletal modeling: bicycle pedaling	D. Häufle	U Stuttgart
Musculo-Skeletal modeling: kicking	D. Häufle	U Stuttgart

If you signed up for one of our projects, please appoint one spokesperson to send us an e-mail to get in touch with us. Karl Kalveram:

http://www.sport.tu-darmstadt.de/sportinstitut/personal/ifs_mitarbeiter/mitarbeiterdetails_20160.en.jsp Daniel Häufle: http://www.inspo.uni-stuttgart.de/aVI/mitarbeiter/Haeufle/ Once we have your contact details we will send you more information and material for your projects.

Simulation Projects in Stuttgart: we reserved a room at the Institute of Sports and Movement Science Allmandring 28F for the following dates:

- Mo. 23.5.16 09-12 Uhr (Room O 111)
- Mo. 30.5.16 14-18 Uhr (Room O 111)
- Mi. 01.6.16 15:30-18 Uhr (Room U 109)
- Mi. 08.6.16 15:30-18 Uhr (Room O 111)

You can use these times to work on your projects. Daniel Häufle will be around to help you with your task and answer your questions. If you are from Karlsruhe or Darmstadt, we can also advice you via e-mail, phone or Skype.

Previous M^3 Seminar 2016
Previous M^3 Seminar 2015
Previous M^3 Seminar 2014
Previous M^3 Seminar 2013