Two Ph.D. positions within Avatar Robotics, University of Twente, Netherlands
- Deadline: September 1, 2020, applications via link below.

We offer two four-year Ph.D. positions funded by the University of Twente's Predictive Avatar Control and Feedback (PACOF) project. The scope of the project, consisting of three PhD students, is to enable natural robotic avatar-mediated interactions, including haptic feedback, in the presence of communication delays and disturbances. Applications of avatars are the core of modern robotics application and range from remote surgery over disaster response to home care. The project's focus lies on modelling the robot's environment and control, modelling of human intentions and building optimal control strategies for prediction and error compensation.
One position (P1) focuses on automatically modelling the humans in the loop. The other position (P2) deals with establishing a mathematical framework based on profound tools, such as model predictive control and modern tracking approaches. A third position, on model-mediated telemanipulation control and SLAM-based VR building, has already been filled.

Responsibilities
In P1 you will be responsible for creating data-based models of (1) the short and medium-term intentions of the humans in the loop, and (2) quantifying the effects of erroneous predictions. In P2 you will deal with developing disturbance-robust model structures and parameter estimators, anticipating transmission delays and optimizing the avatar-operator feedback interconnection. This includes control techniques for both nonlinear as well as distributed parameter systems. You will use these in collaboration with the other Ph.D. candidates in the team to optimise predictive control of the robot and develop mitigation strategies to minimise the perceived effects of mistakes.

Your profile
You are ambitious and passionate about using technology to solve the challenges of our time and improve people's lives.
+ You have an M.Sc. degree in computer science, mathematics, mechatronics or a related field and are experienced in one of the following subjects or related fields:
  ● machine learning, behavioural modelling (P1) or
  ● mathematical analysis, systems and control theory (P2)
+ You have experience and interest in modelling human social behaviour/social interactions (P1)
+ You have strong analytical and conceptual skills.
+ You are an open, creative thinker.
+ You enjoy working as part of a team, but are capable of working independently as well.

The research team
Both advertised positions are unique in their embedding in a team of three Ph.D. candidates who will work to together on three major aspects of the problem: the on-line modelling of human intentions, the mathematical modelling of pro-active control and the model-mediated telemanipulation and VR building. The interdisciplinary project thus bridges computer science, mathematics and robotics within the EEMCS faculty.
Position P1 will be embedded in the HMI group at the University of Twente, which is a vibrant group that does research on various forms of interaction, from brain-computer interfaces to social robots. It has a particularly strong expertise in research that combines technological and human or social aspects, including data-driven behaviour modelling and coaching.
Position P2 will be embedded in the Hybrid Systems group within the Department of Applied Mathematics, which has a long tradition in mathematical systems and control theory. The core expertise includes infinite-dimensional systems, both theoretical and applied, and in particular of port-Hamiltonian form.

More details about the positions (e.g. salary) and the University of Twente can be found at
https://www.utwente.nl/en/organisation/careers/!/1228719/
Applications should be submitted through the above website. For questions please contact
Gwenn Englebienne (P1), g.englebienne@utwente.nl or
Felix Schwenninger (P2), f.l.schwenninger@utwente.nl