

## Robotics for Life Support

Interaction between robots and humans has become a significant issue for the future, as the robots has opened their way to human's daily life. Control algorithm, which once have been considered obsoleted technology plays an important role to design/guarantee safe and well-functioning physical human robot interaction. In this talk, control algorithms along with a (relatively) new actuator system are introduced that are utilized for various service robots that interact with human.

As an example of novel actuator for physical human robot interaction, Series Elastic Actuator (SEA) developed for safe force control is introduced and analyzed in terms of dynamics and control. Disturbance observer is also introduced as a key control technology for the high performance and safe interaction control. Lastly, several exercise robots are introduced as applications of the proposed actuator and control algorithms.

Moreover, several insights that will reveal the way to converge interactive control algorithms and machine learning technology are introduced.