Myoelectric control of a compliant robot gripper

ETF Robotics Lab — project brief (one-pager)

Level: Exam project, Bachelor thesis, Master thesis, or an internship

Duration: 2 to 6 months

Start: By agreement

Mentors: G. Milovanović; N. Knežević; K. Jovanović

Institution: ETF Robotics

Overview and Technology: Topics are defined so that the student can deal with the myoelectric control of a compliant robotic gripper to a greater or lesser extent. The complexity of the task ranges from completely theoretical topic to a practical one, implying advanced research activities. This is on student to choose depending on his/her background, interests, time resources, etc.

Platforms / hardware	**Software & tools**
• QB move maker pro variable stiffness actuator • Joystick • Delsys Trigno wireless EMG system	• MATLAB (MathWorks) • Simulink (MathWorks) • EMG database will be provided
Project options (projects can be modified based on student interests**)** • Detailed survey of state-of-the-art robotic grippers • Investigation of SVM as a classifier of hand gestures, envisioned to be used as commands for a robot gripper • Testing of the model(s) using a robot in the lab	
Expected outcomes	**Recommended background**
• Literature review • Project code and documentation/video • Final report in IEEE research paper form	• Robotics basics • Basics in EMG signal processing • Machine learning and feature engineering fundamentals • Diligence and independence in work
Literature • Quitadamo, L. R., et al. "Support vector machines to detect physiological patterns for EEG and EMG-based human–computer interaction: a review." *Journal of neural engineering* 14.1 (2017): 011001. • Toledo-Pérez, Diana C., et al. "Support vector machine-based EMG signal classification techniques: A review." *Applied Sciences* 9.20 (2019): 4402. • Other documentation	