

<b>Group project</b>			
<b>Credits: 5 Semester 2 Compulsory: Yes</b>			
<b>Format</b>	Lectures 15	Examples	Private study 120 h
<b>Lecturers: Ph. Dépincé, M.Zoppi, T.Zielinska, E. Cervera</b>			
<p><b>Objectives:</b> The aim of this module is to provide students with the opportunity to apply their specialized knowledge to the solution of a real problem, and gain practical experience of the processes involved in the team-based design and testing of a robotic system.</p> <p><b>Work contents:</b> The projects contain a mix of theoretical and practical work. The practical work may consist of one or more of the following components: software development, simulation, hardware development. The deliverables always include a report and, if requested by the supervisor(s), software and/or hardware deliverables.</p> <p><b>Examples of project subjects given in previous years:</b></p> <ul style="list-style-type: none"> <li>• Hybrid localization system for a mobile robot using magnet detection.</li> <li>• Modeling, Identification and Control of 3 DOF Quanser Helicopter.</li> <li>• Comparison of various temperature control laws.</li> <li>• Development of models for camera calibration and validation.</li> <li>• Calibration of the geometric parameters of the Neuromate robot.</li> <li>• Trajectory planning for pick and place operations: application to the Orthoglide.</li> <li>• Measurement of reaction forces during the walking of Nao</li> <li>• Motion estimation for visual odometry.</li> <li>• Representing environmental sounds using auditory cortical models.</li> <li>• Scheduling of fixed priority tasks for uni-processor systems.</li> <li>• Robust control of an overhead crane. Development of a signal processing tool for maximum entropy reconstruction of 2D NMR spectra</li> </ul>			
<p><b>Abilities:</b> Each individual student will be expected to have contributed fully in the team's activities, and will be expected to be able to:</p> <ul style="list-style-type: none"> <li>Justify the hardware and software design of their team's finished robot.</li> <li>Use project management tools to organise their activities.</li> <li>Produce, test, and evaluate a working system.</li> <li>Deliver appropriate documentation of a professional standard.</li> </ul>			
<p><b>Assessment:</b> The evaluation is made by a jury which includes the supervisor(s) plus at least two other staff members. It is based on the following items: quality of work, quality of the written report, and final defense in front of the jury. The supervisors can also require a demonstration of the final product. The effectiveness of the team's management of the project, and the understanding and contribution of each team member are also taken into account.</p>			
<b>Recommended texts:</b> Will be given by the lecturers.			