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Nr. crt.	Titlu lucrare	Scurtă descriere	Cerințe	Nivel (licență/ master)
1	AI planning for real-time nonlinear control	The student will work on the real-time application of AI planning methods to nonlinear control, with the prerequisite fundamental developments. The application will be a rotational pendulum.	Strong algorithmic skills, Matlab and C programming.	Licență sau Master
2	Nonlinear identification and control of a DC-motor based inverted pendulum setup	An Arduino-controlled, Dynamixel DC motor is encapsulated in a USB-connected box and usable for system identification experiments (transient analysis, step and impulse response identification, FIR and parametric models). We will focus on developing a nonlinear variant by way of adding an asymmetrical weight to the disk turned by the motor, and solving the required steps for control: modeling/identification, control design.	Embedded programming, Matlab.	Licență sau Master
3, 4	Litter tracking in underwater robotic mapping	In the context of the SeaClear2.0 EU project, we are working on mapping underwater litter with autonomous underwater vehicles. The student will be focusing on tracking litter detected in subsequent image frames, using the pose and dynamic model of the robot.	State estimation, Python, ROS.	Licență sau Master
5, 6	A platform for underwater mapping tests	In the context of the SeaClear2.0 EU project, the students will focus on developing a real-life scale model of the litter mapping system using an already existing BlueRobotics BlueROV2, a pool, and an overhead-camera-based positioning system. Components include control design for the robot, positioning of the robot and litter from the overhead camera image, detection of litter from ROV camera images, litter mapping.	Matlab, Python, ROS.	Licență sau Master
7, 8	Multiagent control of a team of TurtleBot robots	We will develop and apply multiagent control methods to a team of 2 to 6 TurtleBot robots. The application may be modeling of a traffic intersection, and methods will exploit control and AI to optimize objective functions that include group-level objectives like throughput as well as local objectives like energy usage.	Matlab/Simulink, ROS	Licență sau Master
9	Reinforcement learning for control	The student will work either on fundamental developments in reinforcement learning, on their real-time application to nonlinear control, or a combination of the two.	Strong analytical and mathematical skills, algorithmics, and	Licență sau Master

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			Matlab programming.	
10	Classification from point clouds	We are running a PhD project on reinforcement learning for designing trajectories of a 3D sensor (LIDAR, infrared, etc.) so as to classify as fast as possible a set of objects in a scene. The student will be focusing on the subproblem of classification from a point cloud.	Python, ROS.	Licență sau Master