ŞL Natsakis Tassos

Nr.crt.	Titlu lucrare	Scurta descriere	Cerinte	Nivel (licenta/master)
1	Autonomous navigation of a mobile robot	This thesis is connected to a possible participation at the European Rover Challenge (https://roverchallenge.eu/en/erc-robotics-competition/). The challenge is about designing an autonomous rover that explores Mars. This subtask is about navigating unknown terrain and gathering relevant information about the environment.	Robotics, ROS, Arduino	Licența
2	Device for sample collection from the ground	This thesis is connected to a possible participation at the European Rover Challenge (https://roverchallenge.eu/en/erc-robotics-competition/). The challenge is about designing an autonomous rover that explores Mars. This subtask is about designing a device for drilling, collecting, and storing ground samples.	Robotics, ROS, Electronics, Hardware design	Licență
3	Hollistic control of a mobile robot with a robotic arm	This thesis is connected to a possible participation at the European Rover Challenge (https://roverchallenge.eu/en/erc-robotics-competition/). The challenge is about designing an autonomous rover that explores	Robotics, ROS, Control theory	Licența

		Mars. This subtask is about controlling a robot arm coupled with a mobile robot to achieve several maintenance tasks		
4	Gesture control of a mobile robot	The goal of this project is to design an intuitive controller of a mobile robot using gestures. This can be achieved either through gesture detection via a depth camera, or through a specially designed device for the user's hand	Robotics, Electronics, Hardware design		Licența
5	Robotic fire-fighting robot	The goal of this thesis is to design and implement a fire-fighting robot that is able to detect where is the focus of a fire and direct a water jet towards its base. To achieve this, the robot should be able to control the azimuth and altitude of the water cannon, together with the water pressure.	Robotics, Arduino Linux, ROS		Licența
6	Robotic prosthetic hand	The goal of this project is to design and construct a robotic prosthetic hand, aiming at helping amputees perform basic every day tasks. The robotic arm should be lightweight and offer a level of dexterity so that the patient can grasp objects of different sizes and shapes. Appropriate modelling and control of the robotic hand	Robotics, 3D design, hardware		Licența

		should be developed.		
7	Robotic glove for finger rehabilitation	A stroke is a medical condition that affects the quality of life of millions of people world wide. A usual symptom of a stroke is the inability to control the motion of ones fingers, resulting in problems achieving every day tasks. The goal of this thesis is to design and implement a device that will perform a passive motion of the fingers of a patient. The device should be easily attached to the patients hand and should control the extention and flexion of each finger separately.	3D design, Hardware, Electronics, Control	Licența
8	Quantitative analysis of the performance of a depth camera	Depth cameras are constantly being used in real-life application, one important use case being the detection of motions of human beings. The claims of the manufacturer for their accuracy are not always well documented, and comparison to ground truth data is necessary. The goal of this thesis is to make a quantitative analysis of the accuracy of skeleton tracking of an Orbbec Astra Pro	ROS, Data analysis, Signal processing	Licența

		camera, compared to data acquired by an OptiTrack system.		
9	Online and real-time intention prediction of upper limb motion	With the advent of collaborative robots, the opportunity to use robotic arms in the vicinity of humans has emerged. Human-robot collaboration is a rapidly developing field for industrial applications, but can also have significant impact on healthcare related applications, such as rehabilitation. However, in order to implement human-robot collaboration, there has to be real-time and objective communication to the robot about the intentions of the human. The goal of this project is to implement in ROS an already existing algorithm for the prediction of the intention of motion. The training of the algorithm is happening currently offline, but it would be very beneficial to perform this online and in real-time.	Matlab, Signal processing, ROS	Licența
10	Human avoidance during robot operations	Using a robot in the vicinity of a human is a common application,	Robotics, C++, Linux, ROS	Master

| | | especially with the advent of collaborative robotics. Even though collaborative robots have inherent safety features, these mainly concerns force limits which are activated only after there is contact between the robot and a human.

This project aims to improve this situation, by using a depth camera to detect the human and make sure the robot avoids him/her. This will make the robot even safer to operate close to humans. | | |