Propozycje tematów prac magisterskich 2021/2022
Studia stacjonarne – SAAS
(w j. angielskim)

LP.	TEMAT	CEL PRACY	ZADANIA	PROMOTOR
1	Optimization of Fault Passage Indicators (FPIs) in distribution systems	Applications of optimization techniques in determination of Fault Passage Indicators	1. Address the problem of optimally allocating a fixed number of faulted-circuit indicators in order to minimize the locating method of faults occurring along a distribution feeder. 2. Proceed to look at optimization techniques and choose the genetic algorithm to optimize the problem. 3. Improve the objective function to be minimized by genetic algorithm defining all its parameters (population, mutation, crossover, selection and fitness).	dr hab. Magdalena Szymkowiak
2	Lifetime analysis of unmanned aerial vehicles	Implementation of probabilistic models to analyze the lifetime of unmanned aerial vehicles	1. Theoretical background of reliability theory 2. Review of functions used in lifetime analysis 3. Implementation of selected functions to analyze unmanned aerial vehicles lifetime	dr hab. Magdalena Szymkowiak
3	Autonomous navigation of a car-like vehicle	Application of navigation and perception methods for a semi-autonomous navigation	1. Overview of navigation techniques in mobile robotics. 2. Selection of a class of control and perception methods. 3. Implementation of algorithms using a laboratory-scaled vehicle. 4. Experimental evaluation of navigation strategies in selected scenarios.	dr hab. inż. Dariusz Pazderski
4	Implementation of selected control algorithms for a underactuated marine vehicle.	Writing software for equations describing the motion of a marine vehicle and control of incomplete knowledge of input signals.	1. Analysis of marine vehicle control methods based on known literature in the case of incomplete input signals. 2. Selection of control methods for the underwater marine vehicle. 3. Implement the selected equations according to vehicle parameters in the Matlab / Simulink package to perform simulation tests. 4. Software verification and discussion of test results and conclusions.	dr hab. inż. Przemysław Herman, prof. PP
5	Differential flatness of crane system	Experimental verification of a crane control system b	1. Theoretical backgroud of differential flatness. 2. Simulation study of the proposed control system. 3. Implementation of algorithm using a laboratory-scaled crane system. 4. Experimental evaluation in selected scenarios.	dr inż. Marcin Nowicki
6	Robust feedback linearization	Analysis of the robustness of control techniques based on feedback linearization	1. Theoretical backgroud of feedback linearization (static/dynamic/partial). 2. Tcheoretical background of perturbed and uncertain control system. 3. Synthesis of a robust feedback linearization controller. 3. Simulation study of the proposed control system. 4. Experimental evaluation (optional) on the selected lab equipment.	dr inż. Marcin Nowicki
7	The control of soft continuum robot by Reinforcement Learning algorithm	Design of control algorithm by learning an agent through Reinforcement Learning	1. Developlement of soft robot model by continuum dynamics 2. Design the RL enviroment to solve control goal 3. Learning the agent for defined set of cases 4. Preparing simulations and analysis of obtained controller	dr hab. inż. Jakub Bernat
8	Control for a group of differentially driven mobile robots	Software implementation for multi-robot control and communication	1. Review of literature 2. Implementation in Matlab/Simulink 3. Implementation in C++ 4. Algorithm tests for varoius motion scenarios	dr hab. inż. Wojciech Kowalczyk