Dr. Ing. Cristina Muresan

Nr.crt.	Titlu lucrare	Scurta descriere	Cerinte	Nivel (licenta/master)
1	Validation of a novel IMC controller on a vertical take off and landing (VTOL) system https://www.ni.com/en-us/support/model.quanser-qnet-vtol-board-2-0-for-ni-elvis-ii-ii-.html	Study of the basic IMC method and the new version for improved disturbance rejection. Comparisons for a vertical take off and landing unit (Matlab simulation). Implementation and validation on the VTOL system. Analysis of results	System theory Matlab programming skills are required, excellent knowledge of CE 1 and 2.	Licenta/Master
2	Design and implementation of a novel FO autotuning method on the vertical take off and landing system https://www.ni.com/en-us/support/model.quanser-qnet-vtol-board-2-0-for-ni-elvis-ii-ii-.html	Research on FO autotuners. Design of a novel approach and comparison with similar methods. Simulation results. Implementation and experimental validation on a VTOL system.	System theory Matlab programming skills are required, excellent knowledge of CE 1 and 2.	Licenta/Master
3	Fractional order control of a two-rotor system http://www.inteco.com.pl/products/two-rotor-aerodynamical-system/	Study of 2-3 autotuning methods for fractional order (FO) controllers. Implementation of relay experiment to acquire necessary experimental data. Design of the FO-PID controllers. Experimental tests, analysis of results, comparisons with other methods.	System theory Matlab programming skills are required, excellent knowledge of CE 1 and 2.	Licenta/Master
4	Advanced level control	System identification (flow-	System theory	Licenta/Master

	http://www.inteco.com.pl/products/multi-tank/ https://a-lab.ee/man/Multitank-user-manual.pdf	level), PID control, state space control system design, LQR control (also based on state space representation), closed loop analysis of experimental results, comparison of results	Matlab programming skills are required, excellent knowledge of CE 1 and 2. Papers dealing with similar topics: https://fluidas.ro/hervex/proceedings2017/pp.74-79.pdf https://e-university.tu-sofia.bg/e-conf/files/169/paper_10.47978@TUS.2020.70.03.017.pdf	
5	Advanced control of a two-rotor system http://www.inteco.com.pl/products/two-rotor-aerodynamical-system/	System identification, Study of 2-3 control methods, Design of the FO-PID controllers. Experimental tests, analysis of results, comparisons with other methods.	System theory Matlab programming skills are required, excellent knowledge of CE 1 and 2.	Licenta/Master
6	Modelling and control of the hemodynamic system	Analysis of the hemodynamic system (MIMO system, interaction, pairing) – generalization of a nominal model to multiple patients, design of MIMO IMC controller, discrete-time implementation, Matlab simulation testing and validation, analysis of results	System theory Control engineering I/ II Matlab	Licenta/Master
7	Event-based control of the hemodynamic system	Analysis of the hemodynamic system (MIMO system, interaction, pairing) – generalization of a nominal model to multiple patients, design of MIMO IMC controller, discrete-time implementation,	System theory Control engineering I/ II Matlab	Licenta/Master

		Matlab simulation testing and validation, analysis of results		
8	Modelling and fractional order control of the hemodynamic system – decentralised approach	Analysis of the hemodynamic system (MIMO system, interaction, pairing) – generalization of a nominal model to multiple patients, design of MIMO decentralised fractional order IMC controller, discrete-time implementation, Matlab simulation testing and validation, analysis of results	System theory Control engineering I/ II Matlab	Licenta/Master
9	Modelling and fractional order control of the hemodynamic system – decoupled approach	Analysis of the hemodynamic system (MIMO system, interaction, pairing) – generalization of a nominal model to multiple patients, design of MIMO decoupled fractional order IMC controller, discrete-time implementation, Matlab simulation testing and validation, analysis of results	System theory Control engineering I/ II Matlab	Licenta/Master
10	Multivariable control in pharma	Analysis of pharma process, design of MIMO decentralised and decoupled control strategies, discrete-time implementation, Matlab simulation testing and validation, analysis of results	System theory Control engineering I/ II Matlab	Licenta/Master