



Universitatea Tehnică din Cluj-Napoca Facultatea de Automatică și Calculatoare Domeniul: Ingineria Sistemelor Programul de studiu: Automatică și Informatică Aplicată

Teme pentru proiecte de diplomă și disertație

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Nr. crt.	Titlul temei	Scurta descriere	Cerințe / Cunoștințe necesare	Nivel (licenta/ master)
1	Multi-Input-Multi-Output control of	- Simulation based on an anesthesia benchmark system	- System identification	Licenta
	general anesthesia	built in Simulink		
			- Control engineering	
		- 6 inputs and 6 outputs		
		Integen ander MIMO control	- Good Knowledge of	
		- Integer order MIMO control	Matiad/Simulink	
		Difficulty: medium+		
2	Multi-Input-Multi-Output fractional	- Simulation based on an anesthesia benchmark system	- System identification	Licenta
	order control of general anesthesia	built in Simulink		
			- Control engineering	
		- 6 inputs and 6 outputs		
			- Good knowledge of	
		- Fractional order MIMO control	Matlab/Simulink	
		Difficulty: hard		
3	Event-based Multi-Input-Multi-	- Simulation based on an anesthesia benchmark system	- System identification	Licenta
	Output fractional order control of	built in Simulink		
	general anesthesia		- Control engineering	
		- 6 inputs and 6 outputs		

Nr. crt.	Titlul temei	Scurta descriere	Cerințe / Cunoștințe necesare	Nivel (licenta/ master)
		- Fractional order event-based MIMO control	- Good knowledge of	
		Difficulty: hard+	Matlab/Simulink	
4	System identification of a liquid steel manufacturing plant	- Simulation	- System identification	Licenta
		- based on experimental data acquired from a continuous stirrer	- Good knowledge of Matlab/Simulink	
		- the liquid steel is driven through the caster using a variable magnetic field		
		- the developed model should connect the applied current to the EMA device and the speed of the steel particles		
		Difficulty: hard		
5	Advanced process control of a liquid steel manufacturing plant	- Simulation	- System identification	Licenta
	steel manaraetaring plant	- based on a fractional order model of the plant	- Control engineering	
		- the developed controller should control the speed of the steel particles	- Good knowledge of Matlab/Simulink	
		Difficulty: hard		
6	Fractional order controller tuning using Machine Learning	 theoretical thesis in depth state of the art analysis	- System identification	Licenta
		- testing and validating existing methodologies on various processes (first order, second order and time delay systems)	- Good knowledge of Matlab/Simulink	

Nr. crt.	Titlul temei	Scurta descriere	Cerințe / Cunoștințe necesare	Nivel (licenta/ master)
		Difficulty: medium+	- Desire to learn AI	
7	Fractional order controller tuning using Deep Learning	 theoretical thesis in depth state of the art analysis testing and validating existing methodologies on various processes (first order, second order and time delay systems) Difficulty: medium+ 	 System identification Control engineering Good knowledge of Matlab/Simulink Desire to learn AI 	Licenta
8	Fractional order system identification using Machine Learning	 theoretical thesis in depth state of the art analysis testing and validation of existing methodologies on various processes comparison with classical identification techniques Difficulty: hard 	 System identification Control engineering Good knowledge of Matlab/Simulink Desire to learn AI 	Licenta
9	Fractional order model predictive control of a Vertical Take-Off and Landing Platform	 Experimental thesis Identification based on real-life VTOL data Controllers should be validated on the experimental platform Difficulty: hard 	 System identification Control engineering Good knowledge of Matlab/Simulink 	Licenta
10	Fractional order model predictive control of the hemodynamic system	- Simulation based on an anesthesia benchmark system built in Simulink	- Control engineering	Master

Nr. crt.	Titlul temei	Scurta descriere	Cerințe / Cunoștințe necesare	Nivel (licenta/ master)
		 2 inputs and 2 outputs Fractional order model predictive control of the MIMO process Difficulty: hard 	- Good knowledge of Matlab/Simulink	