

**Dulf Eva**

Nr.crt.	Titlu lucrare	Scurta descriere	Cerinte	Nivel (licenta/master)
1	Machine learning based robot development for high frequency trading on online trading platform – in collaboration with Obuda University	The student has to develop a trading robot based mostly on historical data of given online trading platform (stock exchange) using machine learning techniques (e.g. LSTM, RL, etc.). Many open source implementations are already exists, these has to be investigated, own implementation should be carried out on free web platform.	Python, web development knowledge (basics), Machine learning knowledge, English, high independency	MSc
2	Closed-loop control of physiological processes using advanced control solutions – in collaboration with Obuda University	Advanced control techniques, like linear parameter varying techniques, tensor product transformation based control, gain scheduling, linear matrix inequality based optimization should be applied on physiological problem for control purposes.	MATLAB, control engineering knowledge (medium), mathematics, English, high independency	MSc
3	Reinforcement learning based decision support system development focusing on physiological processes – in collaboration with Obuda University	Reinforcement learning based decision support systems is an emerging field in the research community (e.g. AlphaGO). The knowledge of experts can be described using knowledge libraries, but the expertise of professionals is hard to copied.	Python, web development knowledge (basics), Machine learning knowledge, English, high independency	MSc

		The student should investigate already existing solutions and realize own implementation for cancer control purposes.		
4	Domain of attraction estimation of nonlinear systems – in collaboration with Obuda University	Domain of attraction (DoA) estimation is still an important issue of nonlinear systems, especially, when rational functions can be found in the equations. The student has to implement different existing solutions from the literature and has to develop a platform for DoA estimation for given physiological problems, like cancer.	MATLAB, control engineering knowledge (medium), mathematics, English, high independency	MSc
5	Designing, synthesis and optimization of active vaccinal components in a colorectal cancer study – in collaboration with “Iuliu Hatieganu” University of Medicine and Pharmacy	Computational models, especially those based on the quantitative structure-activity relationship (QSAR) approaches, have been successfully applied to computer aided molecular design (CAMD) for small organic molecules <sup>1</sup> . The present task applies this computational technique to predict the nanostructure-effects by relating this activity to a set of structural and compositional properties. The key step in this study is the definition or codification of the chemical structure by a diversity of molecular descriptors, such as	Matlab, Machine learning knowledge, English, high independency	MSc

		constitutional, topological, thermodynamic, functional groups, quantum mechanical, geometrical, etc.		
6	Computer-aided system to guide the diagnosis, risk stratification and the management of thyroid cancer – in collaboration with “Iuliu Hatieganu” University of Medicine and Pharmacy	Computer-aided diagnosis system development, testing, validation, calibration.	Python, Machine learning knowledge, Image processing knowledge, English, high independency	MSc
7	Computer-aided diagnosis system for Celiac disease – in collaboration with “Iuliu Hatieganu” University of Medicine and Pharmacy	Computer-aided diagnosis system development, testing, validation, calibration	Python, Machine learning knowledge, Image processing knowledge, English, high independency	MSc
8	Modelling and Optimization of Biochemical processes – in collaboration with University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca	Development of different mathematical model for antioxidant production from grape waste. Process optimization	Matlab, Identification methods, Modelling, artificial intelligence, Optimization, English, high independency	BSc
9	Advanced control (Fractional order control)	Design and implementation of advanced controllers for laboratory equipment	Matlab, Mathematics, Control Engineering	BSc
10	Chemical process control – in collaboration with Emerson SRL	Modelling and process identification. Control structure design and implementation in DeltaV	Matlab, Control Engineering	BSc