

Nr.crt.	Titlu lucrare	Scurta descriere	Cerinte	Nivel (licenta/master)
1	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. EEG, EMG signal processing for feedback	MATLAB, control engineering knowledge (medium), mathematics, English, high independency	BSc/MSc
2	Closed-loop control of anesthesia - in collaboration with Obuda University	Advanced modelling of physiological processes in anesthesia. Control loop design using different innovative measurement systems	MATLAB, control engineering knowledge (medium), mathematics, English, high independency	BSc/MSc
3	Computer-aided system to guide the diagnosis, risk stratification and the management of different diseases– 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	BSc/MSc
4	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	Python, web development knowledge (basics), Machine learning knowledge, English, high independency	MSc

		professionals is hard to copied. The student should investigate already existing solutions and realize own implementation for cancer control purposes.		
5	Computer-aided system to guide the diagnosis, risk stratification and the management of heart diseases – 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
6	Tumor growth modelling - in collaboration with Obuda University	Classical mathematical models of tumor growth have shaped our understanding of cancer and have broad practical implications for treatment scheduling and dosage. However, improvement are still necessary on these models.	Matlab, English	MSc
7	Modelling and control in finance– in collaboration with AlphaBlock	Using Reinforcement Learning to achieve desired goals: a) Modelling a physical system/stocks; b) Definition of states and actions (to maximise return/efficient use of resources); c) Graph representation for learning status/progress	Basic knowledge of financial markets and portfolios. Previous experience in Python is preferred, but other programming languages such as MATLAB can also be used. Advanced knowledge of RL is required. English language skills and a high level of independence are required, as the student will be collaborating with an international research team!	MSc
8	Modelling and Optimization of Biochemical processes – in collaboration with	Development of different mathematical models for antioxidant production from	Matlab, Identification methods, Modelling, artificial intelligence, Optimization, English, high independency	BSc

	University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca	fruit wastes. Process optimization. Testing of final product biological effects.		
9	Control loops in autonomous driving	Analyzing autonomous driving control problems: Examining existing solutions; Developing a prototype vehicle	Matlab, AI, Modelling, Control, English, high independency	BSc
10	Advanced control (Fractional order control)	Design and implementation of advanced controllers for laboratory equipment	Matlab, Mathematics, Control Engineering	BSc