ADMISSION TO DOCTORAL STUDIES   Session September 2025

Field of doctoral studies: electrical engineering

Doctoral supervisor: Prof. Ioan Serban

TOPICS FOR THE ADMISSION TO DOCTORAL STUDIES

TOPIC 1: *AI-enhanced control for microgrids with renewable energy sources*
Contents / Main aspects to be considered :   - microgrid hardware configuration analysis;   - control of parallel inverters in a microgrid;   - implementation of advanced control based on AI techniques ;   - modelling and simulation of the microgrid (hardware and control);   - experimental model development in laboratory;   - experimental validation.
Recommended bibliography: [1] N. Hatziargyriou, Microgrids – Arhitectures and Control, IEEE Press-Wiley, 2014;   [2] I. Serban, S. Céspedes, C. Marinescu, C. A. Azurdia-Meza, J. S. Gómez and D. S. Hueichapan, "Communication Requirements in Microgrids: A Practical Survey," in IEEE Access, vol. 8, pp. 47694-47712, 2020.   [3] E. Mohammadi, M. Alizadeh, M. Asgarimoghaddam, X. Wang and M. G. Simões, "A Review on Application of Artificial Intelligence Techniques in Microgrids," in IEEE Journal of Emerging and Selected Topics in Industrial Electronics, vol. 3, no. 4, pp. 878-890, Oct. 2022.   [4] S. Zhao, F. Blaabjerg and H. Wang, "An Overview of Artificial Intelligence Applications for Power Electronics," in IEEE Transactions on Power Electronics, vol. 36, no. 4, pp. 4633-4658, April 2021.   [5] D. B. Rathnayake et al., "Grid Forming Inverter Modeling, Control, and Applications," in IEEE Access, vol. 9, pp. 114781-114807, 2021, doi: 10.1109/ACCESS.2021.3104617.
Prerequisites / Remarks: **-** Bachelor's degree and/or master's degree in electrical engineering or in a similar domain;   - Good command of English ;   - Programming knowledge (e.g. Python, Matlab)
☒ **Scientific Doctorate (full-time only)**   ☐ **Professional Doctorate (full-time or part-time)**
☐ **without tuition fee (state budget funded)**   ☒ **with tuition fee or with funding from other sources than the state budget**

Doctoral supervisor,	Coordinator of the field of doctoral studies,
Prof. Ioan Serban	Prof. Ioan Serban
Signature	Signature