



ADMISSION TO DOCTORAL STUDIES

Session September 2022

Field of doctoral studies: Electrical Engineering

Doctoral supervisor: Prof. Ioan ŞERBAN

TOPICS FOR THE ADMISSION TO DOCTORAL STUDIES

TOPIC 1: *Integration of smart PV inverters in prosumer-based microgrids with EV charging stations*

Content / Main aspects to be considered

- *optimal hardware PV (single-phase) inverter*
- *smart control for PV inverter integration in a prosumer-based microgrid*
- *modelling and simulation of the hardware part in a specialised PE software*
- *modelling and simulation smart control*
- *experimental model development in laboratory conditions*
- *experimental testing.*

Recommended bibliography:

- [1] N. Hatziaargyriou, *Microgrids – Architectures and Control*, IEEE Press-Wiley, 2014;
- [2] I. Serban, "Power Decoupling Method for Single-Phase H-Bridge Inverters With No Additional Power Electronics," in *IEEE Transactions on Industrial Electronics*, vol. 62, no. 8, pp. 4805-4813, Aug. 2015. <https://doi.org/10.1109/OPTIM-ACEMP50812.2021.9590017>
- [3] I. Serban, "Improved control method for single-phase inverters with a minimalist power decoupling circuit," *ACEMP-OPTIM 2021*. <https://doi.org/10.1109/TIE.2015.2399274>
- [4] Y. Liu, W. Zhang, Y. Sun, M. Su, G. Xu and H. Dan, "Review and Comparison of Control Strategies in Active Power Decoupling," in *IEEE Transactions on Power Electronics*, vol. 36, no. 12, pp. 14436-14455, Dec. 2021. <https://doi.org/10.1109/TPEL.2021.3087170>

Prerequisites / Remarks:

- Bachelor's degree and/or Master's degree in electrical engineering;
- Knowledge on power electronics (hardware and control);
- Knowledge of programming in C/Python represents an advantage;
- Good command of English ;

TOPIC 2: *Integration of small wind turbines in prosumer microgrids*

Content / Main aspects to be considered

- *optimal hardware structure of the multi-input power electronic interface for wind turbines;*
- *smart control for integration in a microgrid;*
- *modelling and simulation of the hardware part in a specialised PE software*
- *modelling and simulation smart control*
- *experimental model development in laboratory conditions*
- *experimental testing.*

Recommended bibliography:

- [1] N. Hatziargyriou, *Microgrids – Architectures and Control*, IEEE Press-Wiley, 2014;
- [2] Tawfiq, Kotb B., et al. "Wind energy conversion system topologies and converters: Comparative review." *Energy Procedia* 162 (2019): 38-47.
- [3] Teodorescu, Remus, Marco Liserre, and Pedro Rodriguez. *Grid converters for photovoltaic and wind power systems*. John Wiley & Sons, 2011.
- [4] Marinescu, C., Serban, I., Clotea, L, Marinescu, D., Ion, C.P., Georgescu, M., Barote, L., Forcos, A.: *Rețele Hibrade cu Surse Regenerabile de Energie – Evolutii Moderne (Hybrid Grids with Renewable Energy Sources – Modern Evolutions)*. Transilvania University Press, 2011.

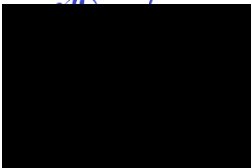
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Doctoral supervisor,

Prof. Ioan ȘERBAN

Signature



Coordinator of the field of doctoral studies,

Prof. Corneliu MARINESCU

Signature

