

ADMISSION TO DOCTORAL STUDIES

Session September 2024

Field of doctoral studies: ELECTRICAL ENGINEERING

Doctoral supervisors:

Aurel Fratu (Transilvania University of Brasov, Romania)

Jacques Curély (Université de Bordeaux, France)

TOPICS FOR THE ADMISSION TO DOCTORAL STUDIES

<p>TOPIC 1: <i>Formal study of fuzzy systems / FUZZY CONTROL IN NAVIGATION SYSTEMS</i></p>
<p>Contents / Main aspects to be considered - <i>to be adapted/ completed/ deleted</i></p>
<p>Recommended bibliography:</p>
<p>Prerequisites / Remarks: <i>to be adapted/ completed/ deleted</i></p>
<p><input checked="" type="checkbox"/> Scientific Doctorate (full-time only) <input type="checkbox"/> Professional Doctorate – in the fields of Music and Science of sport and physical education (full-time or part-time)</p>
<p><input checked="" type="checkbox"/> without tuition fee (state budget funded) <input type="checkbox"/> with tuition fee or with funding from other sources than the state budget</p>
<p>Contents / Main aspects to be considered - <i>to be adapted/ completed/ deleted</i></p> <p>Description of situations in which fuzzy rule control can be used</p> <p>Formulation of the control law by fuzzy rules</p> <p>Basis of rules for fuzzy inferences</p> <p>Membership features</p> <p>Fuzzification methods and applications in fuzzy control</p> <p>Expert Fuzzy Systems</p> <p>Design of fuzzy control systems</p> <p>Implementation of techniques based on fuzzy logic in navigation systems (Maximum power point tracking techniques for photovoltaic systems)</p>
<p>Recommended bibliography:</p> <p>1. Matía, F., Marichal, G., Jiménez, E. (eds) Fuzzy Modeling and Control: Theory and Applications. Atlantis Computational Intelligence Systems, vol 9. Atlantis Press, Paris. https://doi.org/10.2991/978-94-6239-082-9_8</p> <p>2. Al-Hadithi, B. M., Jiménez, A., & Matía, F. (2012). A new approach to fuzzy estimation of Takagi- Sugeno model and its applications to optimal control for</p>

nonlinear systems. *Applied Soft Computing*, 12, 280-290.

3.A. Zakiev, et al., Path planning for Indoor PartiallyUnknown Environment Exploration and Mapping, in Int.Conf. on Artificial Life and Robotics (2018), p.399-402.

4.M. Pecka, K. Zimmermann and T. Svoboda, "Fast simulation of vehicles with non-deformable tracks", *Proc. IEEE/RSJ Int. Conf. Intell. Robots Syst.*, pp. 6414-6419, Sep. 2017.

5.Christiano, Paul, et al. "Transfer from simulation to real world through learning deep inverse dynamics model." *arXiv preprint arXiv:1610.03518* (2016).

6. Al-Majidi SD, Abbod MF, Al-Raweshidy HS (2018) A novel maximum power point tracking technique based on fuzzy logic for photovoltaic systems, *International Journal of Hydrogen Energy* 43 (31): 14158-14171.

7.Bingül Z, Karahan O (2011) A fuzzy logic controller tuned with PSO for 2 DOF robot trajectory control. *Expert Systems with Applications* 38(1): 1017-1031.

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Doctoral supervisors,

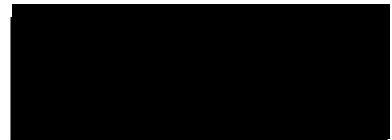
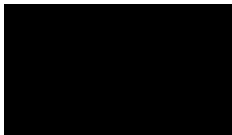
Prof. Dr.Habil.eng.Aurel Fratu

Coordinator of the field of doctoral studies,

Prof. Dr. Ing. Corneliu
Marinescu

Signature

Signature



Prof. Dr. .Jacques Curély.. ...

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