

ADMISSION TO DOCTORAL STUDIES

Session September 2025

Field of doctoral studies: Computer Science

Doctoral supervisor: Prof. Dr. Adrian Marius Deaconu

TOPICS FOR THE ADMISSION TO DOCTORAL STUDIES

TOPIC 1: *Advanced Methods for Automatic Enhancement and Analysis of Digital images*

Contents / Main aspects to be considered

- *Image enhancement and quality assessment*
- *Region of interest segmentation from image data*
- *3D reconstruction from 2D slices*
- *Measurements on planar sections*
- *Validation of proposed methods and performance evaluation*

Recommended bibliography:

1. R. C. Gonzalez and R. E. Woods, Digital Image Processing, 4th ed. Boston, MA, USA: Pearson, 2018.
2. G. L. Foresti, A. Fusiello, and E. R. Hancock, Eds., Image Analysis and Processing – ICIAP 2023, Lecture Notes in Computer Science, vol. 14233. Cham, Switzerland: Springer, 2023. doi: 10.1007/978-3-031-43148-7
3. I. C. Plajer, C. G. Fieraru, and A. Băicoianu, Procesarea imaginilor digitale: Curs pentru învățământul la distanță, anul II, sem. II. Braşov, Romania: Universitatea Transilvania din Braşov, 2024. [Online]. Available: <https://ebooks.unitbv.ro/produs/procesarea-imaginilor-digitale-curs-pentru-invatamant-la-distanta-anul-ii-sem-ii/>
4. S. E. Umbaugh, Digital Image Processing and Analysis: Computer Vision and Image Analysis, 4th ed. Boca Raton, FL, USA: CRC Press, 2023.
5. M. S. Nixon and A. S. Aguado, Feature Extraction and Image Processing for Computer Vision, 4th ed. Cambridge, MA, USA: Academic Press, 2019.
6. J. Cheng, H. Li, D. Li, S. Hua, and V. S. Sheng, "A survey on image semantic segmentation using deep learning techniques," Computers, Materials & Continua, vol. 74, no. 1, pp. 1941–1957, 2023. doi: 10.32604/cmc.2023.032757
7. J. Yang, M. Lyu, Z. Qi, and Y. Shi, "Deep learning based image quality assessment: A survey," Procedia Computer Science, vol. 221, pp. 1000–1005, 2023. doi: 10.1016/j.procs.2023.08.080
- C. Ma, Z. Shi, Z. Lu, S. Xie, F. Chao, and Y. Sui, "A survey on image quality assessment: Insights, analysis, and future outlook," arXiv preprint arXiv:2502.08540, Feb. 2025. [Online]. Available: <https://arxiv.org/abs/2502.08540>

Prerequisites:

- *Digital image processing knowledge*
- *Artificial intelligence*

- **Scientific Doctorate (full-time only)**

- **without tuition fee (state budget funded)**

Doctoral supervisor,

Prof. Dr. Adrian Marius Deaconu

Coordinator of the field of doctoral studies,

Prof. Dr. Sabin Marius Tăbîrcă