Academic and Research Activity
Curriculum Vitae

Axel De Nardin

EDUCATION

Visiting Scholar
Harvard Medical School, Boston MA, USA, 02/2023 - 06/2023

- Host supervisor: Prof. Wang Mengyu
- Research project: "Development of statistical and machine/deep learning models for computer vision in medical imaging with the goal of improving the diagnosis and prognosis of common eye diseases such as glaucoma, age-related macular degeneration and diabetic retinopathy"

Ph. D., Computer Science
University of Udine, Udine, Italy, 10/2020 – present (Predicted end date:01/02/2024)

- Supervisor: Prof. Gian Luca Foresti
- Co-supervisor: Prof. Claudio Piciarelli
- Subject: data efficient semantic segmentation

M. Sc, International Double Degree in Computer Science and Applied Informatics
University of Udine, Udine, Italy, 2018-2020
University of Klagenfurt, Klagenfurt, Austria, 2019

- Graduation grade: 110/110 with Honors
- Thesis title: "Transfer Learning from a general purpose to a shallow, domain specific, dataset in the context of Face Recognition"

B. Sc, Computer Science,
University of Udine, Udine, Italy, 2014-2017

- Graduation grade: 100/110

Languages knowledge:

- Italian: Native language
- English: Excellent (87/100 C2, EF Standard English Test, https://efset.org/cert/TtLHTq)

RESEARCH INTERESTS / RESEARCH PROFILE

The research interest and activity of Axel De Nardin is mainly focused on the field of Machine and Deep Learning techniques in the context of Computer vision systems with a particular focus on semantic segmentation models in data efficient settings.

PUBLICATIONS

- Zottin S, **De Nardin A.**, Piciarelli C. Colombi E., Foresti G. L, U-DIADS-Bib: a full and few-shot pixel-precise dataset for document layout analysis of ancient manuscripts, International Journal of Neural Computing and Applications,NCAA, (Accepted).

- **Axel De Nardin**, Silvia Zottin, Claudio Piciarelli, Emanuela Colombi, Gian Luca Foresti; A One-Shot Learning Approach To Document Layout Segmentation of Ancient Arabic Manuscripts Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision (WACV), 2024, pp. 8127-8136

- Sarao V, Veritti D, **De Nardin A,** et al. Explainable artificial intelligence model for the detection of geographic atrophy using colour retinal photographs BMJ Open Ophthalmology 2023;8:e001411. doi: 10.1136/bmjophth-2023-001411

- Veritti, D., Rubinato, L., Sarao, V, **De Nardin, A.** et al. Behind the mask: a critical perspective on the ethical, moral, and legal implications of AI in ophthalmology. Graefes Arch Clin Exp Ophthalmol (2023). https://doi.org/10.1007/s00417-023-06245-4

- **De Nardin A.**, Zottin S, Piciarelli C. Colombi E., Foresti G. L, *s ImageNet always the best option? An overview on transfer learning strategies for document layout analysis, International conference on* Image Analysis and Processing. ICIAP 2023, (Accepted)

- **De Nardin A.**,Zottin S, Piciarelli C. Colombi E., Foresti G. L, Few-shot pixel-precise document layout segmentation via dynamic instance generation and local thresholding, International Journal of neural systems, IJNS, 33(10), 2350052.https://doi.org/10.1142/S0129065723500521

- **De Nardin A.**, Zottin S., Paier M. Forest G. L, Colombi, E., Piciarelli C., *Efficient few-shot learning for pixel-precise handwritten document layout analysis,* Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision (WACV) 2023, pages 3680-3688.

- Beltrami AP, De Martino M, Dalla E, Malfatti MC, Caponnetto F, Codrich M, Stefanizzi D, Fabris M, Sozio E, D'Aurizio F, Pucillo CEM, Sechi LA, Tascini C, Curcio F, Foresti GL, Piciarelli C, **De Nardin A**, Tell G, Isola M. *Combining Deep Phenotyping of Serum Proteomics and Clinical Data via Machine Learning for COVID-19 Biomarker Discovery.* Int J Mol Sci. 2022 Aug 15;23(16):9161. doi: 10.3390/ijms23169161. PMID: 36012423; PMCID: PMC9409308.

- ***De Nardin, A.**, Mishra, P., Foresti, G. L., & Piciarelli, C. (2022). Masked Transformer for Image Anomaly Localization. International journal of neural systems, IJNS, 32(7), 2250030.* https://doi.org/10.1142/S0129065722500307

- ***De Nardin, A.**, Mishra, P., Piciarelli, C., Foresti, G.L. (2022). Bringing Attention to Image Anomaly Detection. In: Mazzeo, P.L., Frontoni, E., Sclaroff, S., Distante, C. (eds) Image Analysis and Processing. ICIAP 2022 Workshops. ICIAP 2022. Lecture Notes in Computer Science, vol 13373. Springer, Cham.* https://doi.org/10.1007/978-3-031-13321-3_11

- ***Axel De Nardin**, Marino Miculan, Claudio Piciarelli, and Gian Luca Foresti. A time-series classification approach to shallow web traffic de-anonymization.* Proceedings of the fifth Italian conference on cyber security, ITASEC 2021, *volume 2940, pages 156-165. CEUR-WS*

TEACHING EXPERIENCE

Teaching Assistant: Computer Vision, Department of Mathematics, Informatics and Physics, University of Udine, Udine, Italy, 03/2022 - Current

- *The course is part of 3 master degrees programs at the University of Udine and it focuses on the steps going from image acquisition to post processing. Part of the program also includes the use of Machine and Deep Learning techniques applied to images for different tasks.*

GRANTS

- ***Period**:02/2022 – 02/2024*
  ***Title:** "Study and development of Supervised and Unsupervised Machine Learning Algorithms for Anomaly detection in the context of FVG SMACT live demos."*
  ***Coordinator:** Prof. Elio Padoano*
  ***Institution:** University of Trieste, Department of Engineering and Architecture*
  ***Amount awarded:** € 21.169,19 for each year*

- ***Period**:02/2021 – 02/2022*
  ***Title:** "Social Robots and Unmanned Aerial Vehicles: human recognition and re-identification"*
  ***Coordinator:** Prof. Gian Luca Foresti*
  ***Institution:** University of Udine, Department of Mathematics, Informatics and Physics*
  ***Amount awarded:** € 19.367,00*

AWARDS

- *Best Essay Award, "The societal impact of AI, its dual-use and peacebuilding capabilities", International Computer Vision Summer School, ICVSS 2022.*

SCIENTIFIC COMMUNITY CONTRIBUTIONS

- Reviewer: IEEE, IJNS, ICMCIS

TECHNICAL SKILLS

- Programming languages: Python, c++
- Deep Learning Libraries: Pytorch, Keras,
- Other related libraries: Numpy, Pandas, Torchvision, Neptune.ai, Sklearn
- Other relevant skills: SQL