Lemuel Puglisi

Department of Mathematics and Computer Science
University of Catania

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EDUCATION

PhD Computer science, University of Catania, ongoing
Project: "Data-driven neurodegenerative disease progression modeling"

M.S. Computer science, data science specialization, University of Catania, 2023
Thesis: "DeepBrainPrint: A Novel Contrastive Framework for Brain MRI Re-Identification"
Grade: 110/110 *cum laude*
Candidate for the Archimede Prize (XX edition)

B.S. Computer science, University of Catania, 2021
Thesis: "Autoncoders dimensionality reduction in molecular datasets and subsequent prediction of clinical data"
Grade: 110/110 *cum laude*
Candidate for the Archimede Prize (XVIII edition)

WORK EXPERIENCES

2023/24 **Doctoral Researcher**, University of Catania, Italy
Data-driven neurodegenerative disease progression modeling

2023/24 **Imaging Research Scientist**, Queen Square Analytics, London, UK
Machine-learning assisted clinical trials in multiple sclerosis

2022/23 **Research Internship**, Queen Square Analytics, London, UK
Deep Learning based Quality Assessment and Artifact Detection on MRI data

2022/22 **Computer Science Tutor**, University of Catania, Catania, IT
Tutoring activities for the course "Introduzione al Data Mining"

2022/22 **Computer Science Tutor**, University of Catania, Catania, IT
Tutoring activities for the course "Technologies for advanced programming"

2018/21 **Software Engineer**, Freelancer, Catania, IT
SMPP infostructures; administrative and management softwares

RESEARCH AREAS

Neurodegenerative disease progression modeling: understanding the progression patterns of neurodegenerative diseases in order to improve precision medicine and effectively stratify patients in clinical trials.

Medical imaging quality assessment: simulating, detecting, and correcting artifacts in medical images to enhance the accuracy and reliability of image-driven analysis.

Medical imaging analysis: development of cutting-edge medical imaging techniques that enhance diagnostic accuracy.

PUBLICATIONS

Conference Proceedings

2024   **Puglisi, L.**, Alexander, D. C., & Ravì, D. (2024). Enhancing Spatiotemporal Disease Progression Models via Latent Diffusion and Prior Knowledge. In International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI) 2024.
Oral presentation (top <5%), Best Paper Award nomination (top <1%)

2024   **Puglisi, L.**, Rondinella, A., De Meo, L., Guarnera, F., Battiato, S., & Ravì, D. (2024). SynthBA: Reliable Brain Age Estimation Across Multiple MRI Sequences and Resolutions. In 2024 IEEE International Conference on Metrology for eXtended Reality, Artificial Intelligence and Neural Engineering (MetroXRAINE). .

2023   **Puglisi, L.**, Eshaghi, A., Parker, G., Barkhof, F., Alexander, D. C., & Ravi, D. DeepBrainPrint: A Novel Contrastive Framework for Brain MRI Re-Identification. In Medical Imaging with Deep Learning.

Journal Articles

2023   Ravi, D., Barkhof, F., Alexander, D. C., Parker, G. J., **Puglisi, L.**, & Eshaghi, A. "An efficient semi-supervised quality control system trained using physics-based MRI-artefact generators and adversarial training", *Medical Image Analysis*, under review.

PRESENTATIONS

2024   **LDTM 2024 Workshop - Oral presentation**, Marrakech (Morocco)
Presenting the Brain Latent Progression model.

2024   **MICCAI 2024 - Oral presentation**, Marrakech (Morocco)
Presenting the Brain Latent Progression model.

2024   **POND 2024**, University College London, London (UK)
Spatiotemporal disease progression models, related challenges and Brain Latent Progression as the proposed solution.

2023   **Hammer and Nail 2024**, Remote
Spatiotemporal disease progression modeling and robust brain ageing.

2023   **Reading Group**, IPLAB, Catania (Italy)
In-detail lecture about Denoising Diffusion Probabilistic Models.

CERTIFICATIONS

2021   ESB C1 English certification, English Speaking Board (International) Ltd.

2020   CISCO IT Essential, Cisco Networking Academy

AWARDS

2024   Nomination for the MICCAI 2024 Young Scientist Award

2023   Archimede prize candidature (XX edition), University of Catania

2021   Archimede prize candidature (XVIII edition), University of Catania

2020   2020/2021 Merit award - Scholarship, University of Catania

2019   2019/2020 Merit award - Scholarship, University of Catania

2019-22   2019/20 - 2020/21 - 2021/22 Academic Scholarships, ERSU

COURSES TAUGHT

University of Catania

Tutor activities - Introduction to Data Mining

Tutor activities - Technologies for advanced programming

PRIVACY POLICY

English. I give consent to process my data with the purpose of the recruitment process, in accordance to the Regulation of the European Parliament 679/2016, regarding the protection of natural persons and free movement of such data.

Italiano. Acconsento il trattamento dei dati personali contenuti nel presente curriculum vitae ai sensi dell'art. 13 del D. Lgs. 196/2003 e all'art. 13 del Regolamento UE 2016/679 per la protezione delle persone fisiche e giuridiche riguardo al trattamento dei dati personali.

September 2024

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Lemuel Puglisi