Alexandru Buburuzan

buburuzan08@gmail.com | alexbubu.com | alexbubu | Google Scholar

EDUCATION

The University of Manchester — Machine Learning, Computer Vision

BSc(Hons) Artificial Intelligence with Industrial Experience — Sep 2021 – Jun 2025 | Manchester, UK

- **Top 1% of class;** Golden Anniversary and Netcraft awards; **88% GPA** , First-Class Honours - interim transcript.
- Supervisor: Prof. Tim Cootes; Ongoing thesis: *Anomaly Inpainting for Synthetic Medical Data with Diffusion Models.*
- Summer schools: Oxford ML (2023), Cambridge AI in healthcare (2022), EEML (2022).
- Selected courses: Machine Learning, AI & Games, Knowledge-Based AI, Multivariate Statistics, Visual Computing.

Grigore Moisil Theoretical High School — Algorithms, Data Structures, Mathematics

Computer Science and Mathematics — Sep 2017 – Jun 2021 | Timisoara, Romania

- **Valedictorian**; Romanian Baccalaureate with 10/10 in Mathematics, Informatics; IBM Quantum Computing course.
- National Olympiad in Mathematics (**Bronze** in 2021) and Informatics (2021, **qualified 9th** in 2020, **Bronze** in 2018).

EMPLOYMENT

FiveAI – acquired by **Bosch** — Autonomous Driving, Multimodality, Diffusion Models, PyTorch

Research Engineer Intern — Jun 2023 – Jun 2024 | Cambridge, UK

- *Main project:* proposed a novel Diffusion Model for reference-based camera-lidar object inpainting with 3D control.
- Fine-tuned Paint-by-Example for multimodal generation with conditioning, resulting in **13% LPIPS improvement**.
- *Contributions:* co-authored a paper [1] on multimodal fusion for 3D object detection in autonomous driving.
- Implemented explainability and interpretability techniques, demonstrating enhanced camera-LiDAR complementarity.

Rayscape — Medical imaging, Domain generalization, Segmentation, PyTorch

Research Engineer — Jul 2021 – Jun 2023 | remote, part-time

- *Main projects:* developed a **CE-marked algorithm** for lung nodule segmentation, deployed in **over 100 hospitals.**
- Improved the metrics of a nodule malignancy classification algorithm by 3% using Vision Transformers.
- Reduced the out-of-domain gap in multi-label chest X-ray classification by 32% for two covariate shifts [2].
- *Contributions:* aided in the statistical analysis for a clinical study published in Nature Scientific Reports [4].
- Proposed an adaptation of the Detection Transformer to pathology detection which led to 4.6% mAP increase [3].

Machine Learning Intern — Mar 2020 – Sep 2020 | Timisoara, Romania

- Developed an algorithm for detecting intracranial haemorrhages which **sped up the triaging process** .

EXPERIENCE

Manchester University Data Science Society — Project management, Teaching

President & GirlsWhoML campus coordinator — Sep 2024 - Present

- Introduced a new AI Spotlight series, with its inaugural event featuring academic talks on Diffusion Models and VR.
- Established a new partnership with GirlsWhoML and leading a committee of 9 to organize inclusive ML workshops.

Workshops executive — Jun 2022 - Jun 2024

- Taught workshops on computer vision for medical image analysis and self-supervised learning using SimCLR.

Citadel European Datathon — Apr 2023

- Analysed 1.8 million traffic stops in Philadelphia to identify racial disparities in policing.

Climate Hack.AI – ranked 6th/25 top universities in UK, US and Canada. — Jan 2022 – March 2022

- Developed a video generation model for predicting solar photovoltaic power production using satellite images.

PUBLICATIONS

[1] Gunn J, Lenyk Z, Sharma A, Donati A, **Buburuzan A**, Redford J, Mueller R, "Lift-Attend-Splat: Bird's-eye-view camera-lidar fusion using transformers" in *CVPR Workshop on Autonomous Driving (WAD)*, 2024.

[2] Bercean B*, **Buburuzan A***, Birhala A, Avramescu C, Tenescu A, Marcu M, "Breaking Down Covariate Shift on Pneumothorax Chest X-Ray Classification" in *MICCAI Workshop on Uncertainty for Safe Utilization of Machine Learning in Medical Imaging (UNSURE)*, 2023.

[3] Bercean B, **Buburuzan A**, Birhala A, Tenescu A, Avramescu C, Costachescu D, Marcu M, "Revised Set Prediction Matching for Chest X-ray Pathology Detection with Transformers" in *IEEE SMC Conference*, 2023.

[4] Bercean B, Birhala A, Ardelean P, Barbulescu I, Benta M, Rasadean C, Costachescu D, Avramescu C, Tenescu A, Iarca S, **Buburuzan A**, Marcu M, Birsasteanu F, "Evidence of a cognitive bias in the quantification of COVID-19 with CT: an artificial intelligence randomised clinical trial" in *Scientific Reports*, 2023.

*Equal contribution.