Alexandru Buburuzan

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

Education

The University of Manchester — Sep 2021 – Jun 2025 · Manchester, UK
BSc(Hons) Artificial Intelligence with Industrial Experience — Supervised by Prof. Tim Cootes

- Ranked 1st/270+ in year 1, **Top 1%** in year 2; Golden Anniversary and Netcraft awards; 88% GPA (transcript).
- Ongoing thesis: *"Reference-Guided Anomaly Inpainting for Counterfactual Medical Images Using Diffusion Models"*.
- Summer schools: Oxford ML (2023), Cambridge AI Med (2022), EEML (2022). Conferences: MICCAI '23 Vancouver.
- Selected courses: Machine Learning, AI & Games, Knowledge-Based AI, Multivariate Statistics, Visual Computing.

Grigore Moisil Theoretical High School — 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 · *Research Engineer Intern* — Jun 2023 – Jun 2024 · Cambridge, UK
Autonomous driving *Diffusion models* *Multimodality* *PyTorch* — Supervised by Dr. Puneet Dokania, Dr. Romain Mueller

- *Main project:* developed a new diffusion model for camera-lidar object inpainting in driving scenes [1]—patent filed.
- Fine-tuned Paint-by-Example for multimodal generation with 3D control, resulting in **13% LPIPS improvement**.
- Improved BEVFusion by 2% mAP on the nuScenes dataset implementing the multimodal copy&paste augmentation.
- *Other project:* co-authored a paper [2] on multimodal sensor fusion for 3D object detection in autonomous driving.
- Implemented explainability and interpretability techniques, demonstrating enhanced camera-lidar complementarity.

Rayscape · *Research Engineer* — Jul 2021 – Jun 2023 · remote
Medical imaging *Domain generalization* *Segmentation* *PyTorch*

- *Main projects:* developed a CE-marked algorithm for lung nodule segmentation, **deployed in over 100 hospitals**.
- Devised a method reducing the out-of-domain gap in multi-label chest X-ray classification by 28% for two shifts [3].
- Developed a nodule malignancy classifier, improving F1 score by 3% using Vision Transformers.
- *Other projects:* contributed to 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 [5].

Rayscape · *Machine Learning Intern* — Mar 2020 – Sep 2020 · Timisoara, Romania

- *Main project:* developed an algorithm for detecting intracranial haemorrhages which **sped up the triaging process**.

Experience

Data Science and AI Society · *President* — Sep 2024 - Present · University of Manchester

- Leading a committee of ten members to organise ML events; Appointed as GirlsWhoML campus coordinator.
- Introduced a new AI Spotlight series, with its inaugural event featuring academic talks on diffusion models and VR.

Data Science and AI Society · *Workshops Executive* — Jun 2022 - Jun 2024

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

Entrepreneur First Hack — Dec 2024

- Built a platform for battery-to-grid discharge using power production nowcasting, stabilising solar output by 5-10%.

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 data.

Publications

* indicates equal contribution

[1] **Buburuzan A**, Sharma A, Redford J, Dokania P, Mueller R, "MObI: Multimodal Object Inpainting Using Diffusion Models", *arXiv preprint arXiv:2501.03173*, 2025, under review at CVPR.

[2] 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", *CVPR Workshop on Autonomous Driving (WAD)*, 2024.

[3] Bercean B*, **Buburuzan A***, Birhala A, Avramescu C, Tenescu A, Marcu M, "Breaking Down Covariate Shift on Pneumothorax Chest X-Ray Classification", *MICCAI UNSURE Workshop*, 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", *Scientific Reports*, 2023.

[5] 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", *IEEE SMC Conference*, 2023.