Alexandru Buburuzan

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Education

University of Oxford — Oxford, UK · *Oct 2025 – present*

DPhil (PhD) Autonomous Intelligent Machines and Systems

- Fully funded

University of Manchester — Manchester, UK · *Sep 2021 – Jun 2025*

BSc (Hons) Artificial Intelligence with Industrial Experience

- Dissertation supervised by Prof. Tim Cootes: *''Reference-Guided Diffusion Inpainting for Multimodal Counterfactual Generation.''*
- Ranked 1st/270+ in year 1, **Top 1%** in year 2; Golden Anniversary and Netcraft awards (see full transcript).
- Conferences: CVPR'25, MICCAI'23. Summer schools: Oxford ML (2023), Cambridge AI Med (2022), EEML (2022).
- Selected courses: Machine Learning, AI & Games, Knowledge-Based AI, Multivariate Statistics, Visual Computing.

Employment

FiveAI – acquired by Bosch

Research Scientist Intern — Cambridge & Oxford, UK · *May 2025 – present*

- Ongoing work on Vision Language Action (VLA) models supervised by Dr. Puneet Dokania.
- Co-authored a comprehensive study of 37 foundation models for trajectory planning in autonomous driving [1].

Research Engineer Intern — Cambridge, UK · *Jun 2023 – Jun 2024*

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

Rayscape

Research Engineer — Remote · *Jul 2021 – Jun 2023*

- *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 [4].
- 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 [5].
- Proposed an adaptation of the Detection Transformer to pathology detection which led to 4.6% mAP increase [6].

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

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

Experience

Manchester University Data Science and AI Society

President — *Sep 2024 – Feb 2025*

- Led a team of ten to organise ML workshops and introduced a new spotlight series of academic talks.
- Partnered with Entrepreneurs First to host their first UoM event and was selected as a GirlsWhoML campus coordinator.

Workshops Executive — *Sep 2022 – Jun 2024*

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

Publications

* indicates equal contribution

[1] Oksuz K, **Buburuzan A**, Knittel A, Yao Y., Dokania P, ''Foundation Models for Trajectory Planning in Autonomous Driving: A Review of Progress and Open Challenges'', *Under review in TMLR*, 2025.

[2] **Buburuzan A**, Sharma A, Redford J, Dokania P, Mueller R, ''MObI: Multimodal Object Inpainting Using Diffusion Models'', *CVPR Workshop on Data-Driven Autonomous Driving Simulation (DDADS)*, 2025.

[3] 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.

[4] 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.

[5] 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.

[6] 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.