

## Education

### University of Oxford

DPhil (PhD) Autonomous Intelligent Machines and Systems

Oxford, UK · Oct 2025 – present

- Fully funded by University of Oxford's AIMS CDT and Five AI.

### University of Manchester

BSc (Hons) Artificial Intelligence with Industrial Experience

Manchester, UK · Sep 2021 – Jun 2025

- Dissertation supervised by Prof. Tim Cootes: "Reference-Guided Diffusion Inpainting for Multimodal Counterfactual Generation."
- Ranked 1<sup>st</sup>/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

### Five AI – 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

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