Artificial Intelligence in Bio- and Medical Imaging

Supervision team

Main Supervisor: boguslaw.obara@newcastle.ac.uk

Research project

Medical imaging plays a critical role in modern healthcare, providing essential insights for diagnosis, treatment planning, and monitoring of disease progression. However, the increasing volume, complexity, and multimodality of imaging data present significant challenges for clinicians and researchers. Artificial Intelligence (AI), particularly machine learning and deep learning, offers transformative potential to extract clinically meaningful information, improve accuracy, and accelerate workflows in bio- and medical imaging.

This PhD project will explore the development and application of AI methods for the analysis of biomedical imaging data. The research will focus on designing algorithms capable of integrating multi-scale and multi-modal data, improving image reconstruction, segmentation, and classification, and enabling predictive modelling of patient outcomes. Emphasis will be placed on ensuring robustness, interpretability, and clinical relevance of the proposed solutions.

The successful candidate will gain expertise in state-of-the-art AI techniques, computational imaging, and biomedical data analysis, while contributing to advances that have the potential to directly impact patient care and biomedical research. Collaboration with clinical, industrial and academic partners will ensure access to high-quality datasets and foster the translation of research findings into practice.

Applicant skills/background

The ideal applicant will have a strong background in computer science, engineering, physics, or a related quantitative discipline. Experience with machine learning, data science, or image analysis is desirable, as is proficiency in programming languages such as Python or C++. A solid understanding of mathematics, statistics, and signal/image processing will be advantageous.

Prior exposure to biomedical imaging (e.g., MRI, CT, PET, ultrasound, or microscopy) or medical data analysis is beneficial but not essential. Strong problem-solving skills, the ability to work independently and in a multidisciplinary team, and enthusiasm for translating AI research into biomedical and clinical impact are essential.

References

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DOI: 10.1016/j.compmedimag.2024.102461
DOI: 10.1155/2023/5747010