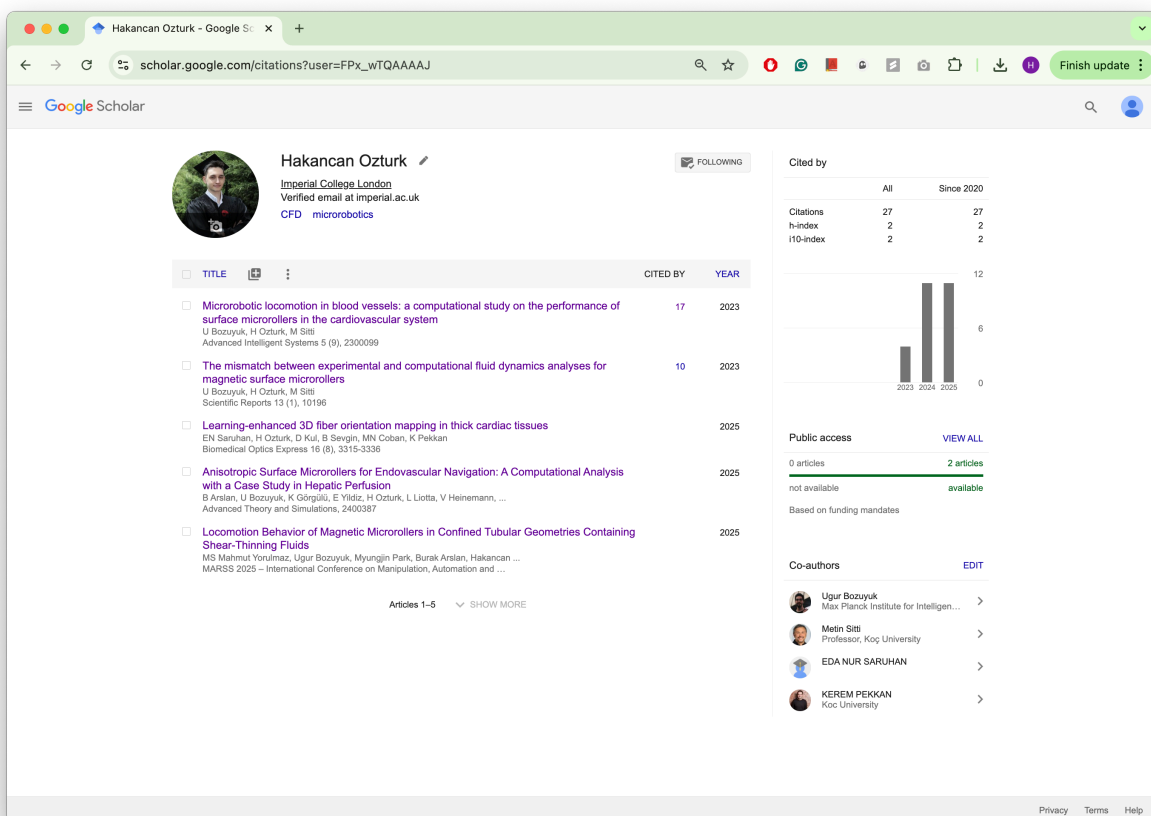


Optional Criteria 4.2 - Cross-Institutional AI Research

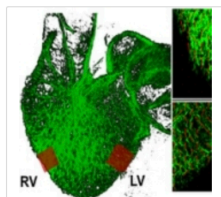
I have contributed to AI/ML research across multiple institutions, working on diverse problems spanning computational physics, medical imaging, and fluid dynamics. My research covers computational fluid dynamics at Max Planck Institute, machine learning for biomedical imaging at Koç University, and grid-invariant AI for turbulent flows at Imperial College London. This breadth demonstrates my ability to apply AI/ML techniques to solve complex problems across different scientific domains.



My research portfolio: 5 publications, 27+ citations across Max Planck, Koç, and Imperial research

Koç University - Biomedical AI

Biomedical Optics Express Vol. 16, [Issue 8](#), pp. 3315-3336 (2025) • <https://doi.org/10.1364/BOE.563643>



Learning-enhanced 3D fiber orientation mapping in thick cardiac tissues

Eda Nur Saruhan, Hakancan Ozturk, Demet Kul, Bortecine Sevgin, Merve Nur Coban, and Kerem Pekkan

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Biomedical Optics Express publication - AI/ML for cardiac tissue analysis (Impact Factor: 3.2, h5-index:

58)

Saruhan, E. N., Ozturk, H., et al. (2025). Learning-enhanced 3D fiber orientation mapping in thick cardiac tissues. *Biomedical Optics Express*, 16(8), 3315-3336.

I contributed AI/ML enhancements to 3D fiber mapping for cardiac tissue analysis in collaboration with Koç University's cardiovascular lab.

Imperial College London - RAPIDS Project (Ongoing)

IMPERIAL

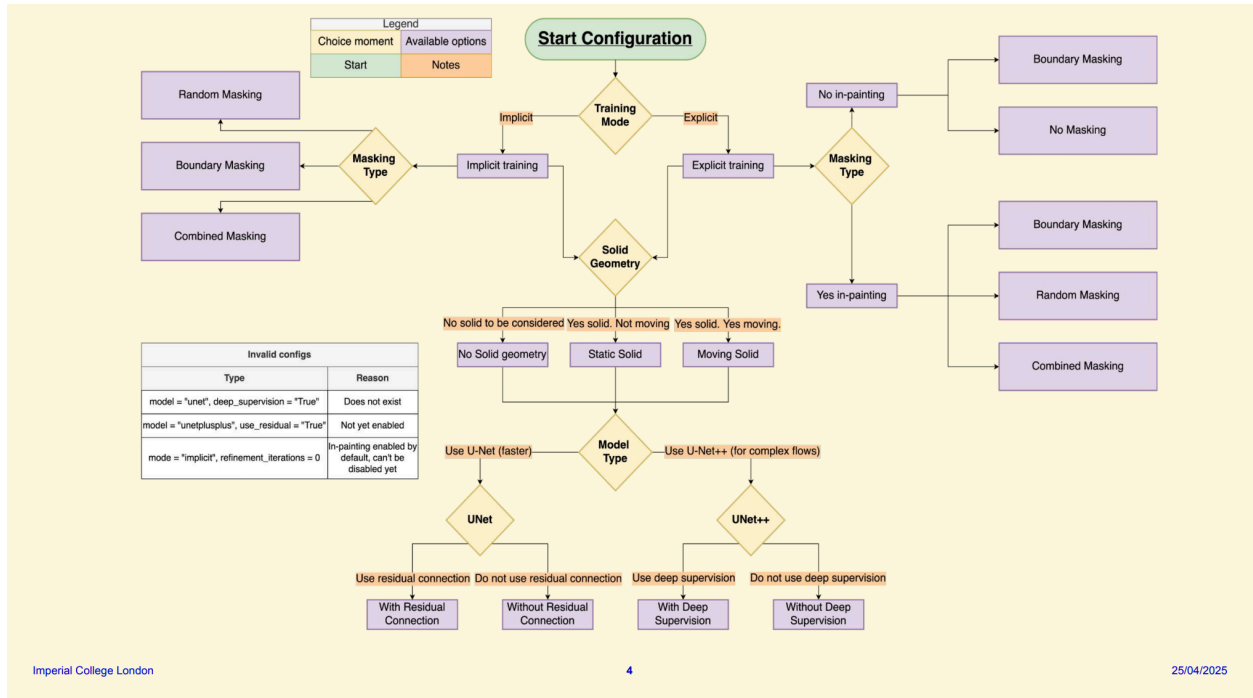
Exploring the effect of mask optimisation and in-painting for a grid-invariant U-Net for modelling fluid flows

A RAPIDS (Rapid AI-Powered Image-to-Dynamic Simulation) study

Aniket Joshi, Donghu Guo, Nathalie C Pinheiro, Hakancan Ozturk, Boyang Chen, Christopher C Pain

Applied Modelling & Computation Group, Department of Earth Science & Engineering, Imperial College London, London SW7 2AZ, United Kingdom.

Grid-Invariant AI architecture for turbulent flow simulation - my MSc research



Neural network architecture I developed combining autoencoders and adversarial networks

ImperialCollegeLondon / RAPIDS

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main 8 Branches 0 Tags

Go to file Add file Code

Aniket-J adding no mask implicit 6 months ago 41 Commits

File	Commit Message	Time Ago
.github/workflows	Create jekyll-gh-pages.yml	6 months ago
AI4PDES_data_creation	added AI4PDEs to generate data	4 months ago
compression_models	trying for compression, line 474 in main flow modified	2 months ago
data_creation_aid	key feature: numpy consolidation for AI4PDEs added	4 months ago
docs	sphinx docs cleanup	2 months ago
scripts_making_your_life_easy	sphinx docs cleanup	2 months ago
src	adding no mask implicit	2 months ago
.DS_Store	compression pipeline working	2 months ago
.gitignore	adding no mask implicit	2 months ago
ESE-cluster-submit.sh	adding scripts for folks to use cluster training	4 months ago
README.md	Apple Silicon supports 3D, see ReadMe for fix	3 months ago
environment.yml	Add modern repository setup with uv-first installation, up...	4 months ago
pyproject.toml	compression pipeline working	2 months ago
requirements.txt	Add modern repository setup with uv-first installation, up...	4 months ago
setup.py	compression pipeline working	2 months ago
test_logs.log	sphinx docs cleanup	2 months ago

README

RAPIDS

Rapid AI-Powered Image-to-Dynamic Simulations

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Rapid AI-Powered Image-to-Dynamic Simulations

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Contributors 2

Aniket-J Aniket J hkc5 Hakancan

Deployments 32

github-pages 2 months ago +31 deployments

Languages

Python 99.4% Shell 0.6%

RAPIDS open-source repository - manuscript currently in preparation

This is ongoing research from my Imperial College MSc where I developed a grid-invariant AI architecture for turbulent flow simulation using PyTorch. I ran over 2,000 GPU hours of optimization and achieved 35% improvement in long-term stability and 50% better prediction accuracy. The project is backed by NVIDIA and automotive companies, and we are currently preparing the manuscript for publication.

References:

- RAPIDS GitHub: <https://github.com/ImperialCollegeLondon/RAPIDS>
- RAPIDS Presentation: <https://docs.google.com/presentation/d/1QNrtneocwtVdyVhZJaoy7EFUgmwjc8Av1lYtuXEiix>
- Koç University Cardiovascular Lab: <https://bio-fluids.org/>
- Biomedical Optics Express: <https://opg.optica.org/boe/>