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Design and Manufacture of Novel 3D Printed Electrodes



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Industry Partner: Mr. Paul
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Researcher: TBC (Electrode
modelling, optimisation, or
manufacturing)

January – April	Recruitment and Physics Based Modelling
April – June	Machine Learning Optimisation
June – October	3D Printing & Characterisation

What does the project demonstrate?

This project will demonstrate the feasibility of designing, optimizing, and manufacturing customised materials at the pore-scale for highly efficient electrochemical devices.

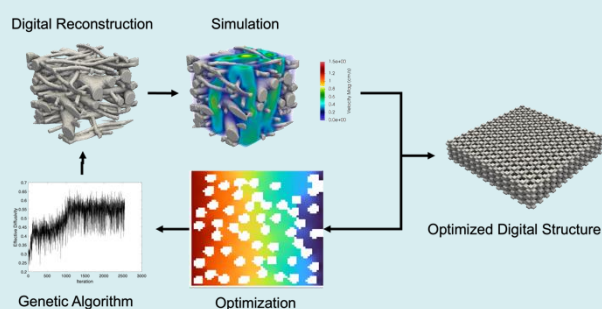
Digital prediction and advanced manufacturing are the foundation of this project. This project will highlight the applicability of a physics-based model coupled to a gradient free optimization method to determine the most optimal arrangement of porous materials. The algorithms will be informed by 3D printing limitations.

These materials will be manufactured (carbon/nickel) and tested in electrochemical devices (fuel cells/electrolysis).

Additional information regarding project, and key highlights wanting to address

- Determine the limits of practical resolution for 3D printing.
- Develop a generalized machine learning algorithm for porous structure optimization.
- Integrate findings into software Porous Microstructure Generator (PMG)

https://data.ncl.ac.uk/articles/software/Porous_Microstructure_Generator/20448471



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