

## EPSRC DLA Project

**PhD studentship:** DEPTHS: Data-driven Evaluation of Pollutant Dispersion in Urban Areas by Detached Eddy Simulation and Experiment

**Supervisor:** [Dr. Amir E. Fard](#) Dr. Francesco Zonta and Dr. Lian Gan

### Award summary

100% fees covered, and a minimum tax-free annual living allowance of £19,237 (2024/25 UKRI rate). Additional project costs will also be provided.

### PhD project overview

Urban air pollution is a pressing global issue, with growing urban populations amplifying the need for accurate predictions and effective improvements in air quality around buildings. This project combines Computational Fluid Dynamics (CFD) and experimental approaches to investigate pollutant dispersion in urban environments.

At Newcastle University, the CFD component (3 years) will focus on Detached Eddy Simulation (DES) under the guidance of Dr. Amir Fard and Dr. Francesco Zonta. To complement this, wind tunnel experiments (1 year) will be conducted at Durham University with Dr. Lian Gan, using scaled urban topology models. Finally, Data Assimilation (DA) techniques will enhance low-cost RANS models by tuning their parameters using high-fidelity results from DES and experiments, improving the accuracy of eddy viscosity-based RANS simulations for urban flows.

We are looking for an enthusiastic PhD candidate with a strong background in **fluid mechanics** and **data analysis**. The following skills and experiences are desired:

- Solid knowledge of turbulence modelling and numerical methods for fluid dynamics.
- Strong analytical skills for interpreting simulation and experimental data.
- Excellent communication and technical writing skills in English.
- Familiarity with data-driven approaches or machine learning techniques for model improvement.
- Knowledge of wind tunnel testing and Particle Image Velocimetry (PIV) for experimental validation.
- Exposure to parallel computing frameworks (e.g., MPI, OpenMP) and high-performance computing (HPC) environments.
- A track record of scientific publications or conference presentations in relevant fields.

This project provides a unique opportunity to work at the intersection of CFD, experimental fluid dynamics, and data science to address critical challenges in urban air quality. If you're passionate about making an impact through cutting-edge research, we encourage you to apply!

This project provides a unique opportunity to work at the intersection of CFD, experimental fluid dynamics, and data science to address critical challenges in urban

air quality. If you're passionate about making an impact through cutting-edge research, we encourage you to apply!

Please ensure you read the **eligibility criteria** and **required documents** on the main advert carefully before applying.

## Number of awards

1

## Start date

1<sup>st</sup> October 2025

## Award duration

4 years

## Sponsor

[EPSRC](#)

## Eligibility Criteria

A minimum 2:1 Honours degree or international equivalent in a subject relevant to the proposed PhD project (such as mathematics or theoretical physics) is our standard entry, however we place value on prior experience, enthusiasm for research, and the ability to think and work independently. Excellent Analytical skills and strong verbal and written communication skills are also essential requirements. A Masters qualification is not required if you have a minimum 2:1 degree or can evidence alternative experience in a work or research-based project. If you have alternative qualifications or experience, please contact us to discuss.

**For EPSRC DLA applications we are following the [EDEPI competency-based framework](#). Please read and complete this [document](#) as your Personal statement, and upload this with your application. Applications which do not include this document will not be considered. Further details can be found [here](#).**

Home and international applicants (inc. EU) are welcome to apply and if successful will receive a full studentship. Applicants whose first language is not English require an IELTS score of 6.5 overall with a minimum of 5.5 in all sub-skills.

International applicants may require an ATAS ([Academic Technology Approval Scheme](#)) clearance certificate prior to obtaining their visa and to study on this programme.

## How to apply

You must apply through the University's [Apply to Newcastle Portal](#)

Once registered select 'Create a Postgraduate Application'.

**Use 'Course Search' to identify your programme of study:**

- search for the 'Course Title' using the **programme code: 8090F**

- select **PhD PhD Mechanical Engineering (full time)** as the programme of study

**You will then need to provide the following information in the 'Further Details' section:**

- a 'Personal Statement' (this is a mandatory field) – [Use this template.](#)
- the studentship code in the 'Studentship/Partnership Reference' field.
- when prompted for how you are providing your research proposal - select 'Write Proposal'. You should then type in the title of the research project from this advert. You do not need to upload a research proposal.

**You must submit one application per studentship, you cannot apply for multiple studentships on one application.**

## Contact Details

Dr. Amir E. Fard (Lecturer in Mechanical Engineering), [amir.fard@newcastle.ac.uk](mailto:amir.fard@newcastle.ac.uk)  
web: <https://www.ncl.ac.uk/engineering/staff/profile/amirfard.html>

You can also contact: [doctoral.awards@ncl.ac.uk](mailto:doctoral.awards@ncl.ac.uk) for independent advice on your application.