Job Description

Research Associate

Salary: Grade 7
Contract: Full time, fixed term
School/Department: School of Engineering
Location: Canterbury
Responsible to: Dr Bo Li

Job purpose

The Research Associate will apply state-of-the-art thermal management techniques to support cooling system integration to high temperature fuel cells stacks for aviation application.

This project is funded by Aerospace Technology Institute (ATI) programme "AFCAD (Advanced Fuel Cells for Aviation Decarbonization)" No. 10097017, led by ZeroAvia. The result of the work could significantly enhance the specific power and lifespan of upcoming hydrogen energy systems designed for larger and long-range aircraft. This is a great opportunity for individuals to develop expertise in the advanced heat and mass transfer, thermal management techniques and fuel cell stack design and integration.

The role will require a strong motivation to manage the research progress but will also be guided by progress meetings with the main supervisor, Dr Bo Li as well as the Co-supervisor, Dr Chao Wang. The Research Associate is expected to work closely with industrial partners and have strong communication skills. The post holder must have a problem - solving approach to meeting the overall project deliverables and will be expected to devise work leading to the drafting and eventual submission of manuscripts to highly regarded academic journals.

Key accountabilities

- To meet the objectives of the relevant project work packages according to the direction of the investigators. New technologies will result which will be integrated with the work of other project researchers.
- To support the research of other team members under the direction of the principal investigator. To enable the successful practical undertaking of research by others.
- To contribute internal research progress meetings with other partner investigators and researchers.
- To read literature and share appropriate articles with the investigator team. Regular literature reviews should be undertaken.

Key duties

The following are the main duties for the job. Other duties, commensurate with the grading of the job, may also be assigned from time to time.

- To undertake autonomous research, according to the direction of the investigators. Simulations, prototypes and results for internal consideration will be produced.
- To analyses and interprets results of technical and experimental work. Recommends and develops solutions for technical and product problems.
- To record and write up research in association with research colleagues and investigators. To prepare and submit manuscripts to journals and conferences.
- To help and advise postgraduate students and undergraduate students with cognate research projects at the request of the principal investigator.
- To facilitate effective training and technical achievements.
- To prepare regular progress reports for presentation to the project management team.
- To read papers, discuss with others and share papers for investigators and other researchers. Paper literature searches, and electronic sharing will result.

Internal & external relationships

Internal: The principal and Co-Investigators in the School of Engineering. Other Research Associates, postgraduate, and undergraduate students in the Mechanical Group of the School of Engineering

External: Industrial Lead: ZeroAvia, Academic Partners: The University of Sheffield Advanced Manufacturing Research Centre (AMRC), C-Alps in Coventry University

Health, safety & wellbeing considerations

This job involves undertaking duties which include the following health, safety and wellbeing considerations:

- Regular use of Screen Display Equipment
- Repetitive limb movements
- Working with machinery
- Working with chemicals (inc. requirement to wear latex gloves and inc. work with CO2 or N2 gasses)
- Biological Agents/Scientific Hazards (experiments/lasers etc, and waste/sewage)

Person specification

The person specification details the necessary skills, qualifications, experience or other attributes needed to carry out the job. Applications will be measured against the criteria published below.

Selection panels will be looking for clear evidence and examples in an application, or cover letter (where applicable), which back-up any assertions made in relation to each criterion.

Essential Criteria:

- PhD or equivalent experience in Mechanical, Chemical or Material Engineering with thermal science experience. (A)
- Experience in Mutliscale, Multiphysics simulation (A, I)
- Experience in complex thermos-mechanical modelling, i.e., numerical simulation for heat and mass transfer (A, I)

- Experience in drafting, editing and submitting research articles as main author (A, I)
- Experience in fabricating prototypes to validate designs experimentally (A, I)
- Experience of determining research methodologies in association with a supervisor (I)
- Excellent team working skills (I)
- Excellent self-management and organisational skills (I)
- Firm commitment to achieving the University's vision and values, with a passion for a transformative student experience and multidisciplinary, impactful research (I)
- Commitment to deliver and promote equality, diversity and inclusivity in the day to day work of the role (I)

Desirable Criteria:

- Experience in support electrochemical analysis in the team, i.e., TEM, FIB, SEM, XPS, and XRD (A, I)
- Experience in using simulation software for design and optimisation, i.e., COMSOL Fuel cell simulation or ANSYS Fluent and additional coding skills to integrate UDF and UDS for thermal modelling (A, I)
- Experience of some advanced thermal coating equipment (I)
- Willingness to travel within the UK and abroad to conferences to present work (I)

Assessment stage: A - Application; I - Interview; T - Test/presentation at interview stage