

Research Fellow

Who are we?

We are the University of Cambridge presence in Singapore called Cambridge CARES (Cambridge Centre for Advanced Research and Education in Singapore) sponsored by the National Research Foundation (NRF) of Singapore as part of its CREATE program. Cooling Singapore 2.0 is an Intra-CREATE collaborative project. The project brings together expertise from Cambridge CARES and SEC (the Singapore-ETH Centre, established by ETH Zürich), as the host institution of the project. The team is led by principal investigators from the University of Cambridge and ETH Zürich.

Energy consumption releases waste heat to the ambient environment, thus affecting the intensity and variability of the urban climate. Therefore, it is critical to have a better understanding of the interdependencies between the environmental effects and energy systems. Jurong Island is the single largest energy consumer in the overall Singapore energy footprint, representing the largest hotspot on the UHI map of Singapore. In order to improve our understanding of the impact of Jurong Island's operation on Singapore's UHI map, the project aims to develop models to study the complex interactions between anthropogenic heat emissions and operating parameters for major industries on Jurong Island. We will also develop mitigation and adaptation solutions for major anthropogenic heat emitters via modelling to alleviate their impacts on Singapore's UHI map. This is being realised through a comprehensive virtualisation of industrial operations, i.e. a hierarchical representation of data and models associated with every entity at different levels of granularity, in order to exploit synergies for resource, energy, and emissions savings. Through an ontological representation of data in a knowledge-graph in combination with an eco-system of autonomously operating software agents, interoperability and automation in cross-domain applications will be achieved.

Our team is comprised of world-class scientists and engineers working in a vibrant, fast-paced environment with great opportunities for knowledge and skills development.

Who are we looking for?

The ideal applicant will develop models to study the anthropogenic heat emissions on Jurong Island and be involved in the development of the theoretical foundations as well as the wider, ongoing development of our knowledge-graph and autonomous agent software. This will involve keeping abreast of the latest web-technologies, making key design decisions, and ensuring their realisation. The specific research topic will fit into the above problem description. (Example publications can be found [here](#).)

The successful candidate will be expected to:

- Publish research results in high-quality international peer-reviewed journals.
- Develop models to study the anthropogenic heat emissions on Jurong Island.
- Develop CFD models to study the dispersion of anthropogenic heat emissions from Jurong Island.
- Design, develop, test, deploy, maintain, and improve software.
- Make strategic decisions on complicated and ambiguous technical problems.

What skills do you have?

- A PhD degree in a relevant discipline such as mathematics, computer science, (theoretical) physics/chemistry, (chemical or mechanical) engineering, or a related subject.
- Experience with one or more general-purpose programming languages such as Java, Python, JavaScript, C/C++, as well as version-control tools such as git.
- Experience with one or more process modelling software such as Aspen, gPROMS, HYSYS.
- Experience with one or more dispersion modelling software such as WRF-CFD, EPISODE.
- A good publication record in at least one of the research areas concerned.
- Excellent oral and written communication skills.
- The ability to work as part of a dynamic, multidisciplinary team of researchers.

What can we offer you?

- A stimulating working-environment with friendly, highly motivated colleagues.
- Opportunities to develop and implement new ideas in a creative environment.
- A competitive salary in line with your skills and experience.
- A one-year contract in the first instance, extendable following satisfactory performance.
- A comprehensive medical insurance cover as part of your employment.

Please note this post is based in the CREATE Tower at NUS University Town, Singapore.

How to apply?

Please apply by uploading your CV and academic transcript to <https://talent.sage.hr/jobs/5136d9ee-2e58-4ab2-8e33-941acdb4d6d7>. If you have any questions, please feel free to reach out to the HR team at recruitment@cares.cam.ac.uk.