![Cambridge CARES logo]

CAMBRIDGE CARES — CAMBRIDGE CENTRE FOR ADVANCED RESEARCH AND EDUCATION IN SINGAPORE LTD.

Air Quality Modeller (AI Researcher)

Who are we?

We are the University of Cambridge research centre in Singapore called Cambridge CARES, sponsored by the NRF CREATE program CAM.CREATE. Health-driven design for cities (HD4) is a collaborative research programme between the University of Cambridge, Nanyang Technological University and National University Singapore within Cambridge CARES.

HD4 sits at the heart of Singapore's global research and development hub and paves the way for a sustainable and healthy city. It will undertake research in the following key areas: characterising the features of the environment that potentially impact health in Singapore; understanding the links between environmental factors, individual behaviour and health outcomes; observing the impact of environmental change on health in Singapore; simulating the impact of potential changes on the health of Singaporeans; and working with government agencies to co-develop data-rich public health tools.

The scientific techniques, technologies, tools and most importantly the knowledge gained through the programme will create a comprehensive systems view of how the urban environment affects population health in Singapore. The programme will train and enrich the talent pool of the next generation of researchers, and benefit from local and international expertise and an innovative interdisciplinary research ecosystem. It will provide the basis for a data-rich public health framework, supporting the development of a healthy Singapore.

Who are we looking for?

We are seeking a highly skilled and motivated Air Quality Modeller to join HD_4. Working collaboratively with a team of population health scientists, geospatial scientists, and data engineers the post holder will lead on building various emission inventories and air quality models for Singapore which incorporate the various air pollution sources in the country and allow for linkage with the geolocations of participants of the Singapore 100K cohort (SG100K), including some geo-located behavioural data. The models will also be set-up and used subsequent scenario modelling to estimate the impact of interventions on air quality and health and disentangle the various sources through source apportionment. This role requires a multi-skilled individual that can work independently and collaboratively in a multidisciplinary team environment.

Key Responsibilities:

- **Collaboration:** Work closely with researchers to understand the data needs of the programme and contribute to the design of scientifically robust and policy relevant models linking emission inventories to air quality models and spatially and temporally assigning exposures for human participants in subsequent epidemiological analyses and health impact assessments.
- **Data, identification, production, and assembly:** Collaborate with team and external scientists, national and local organizations, and conduct independent literature reviews to produce and synthesise the required data sources with high temporal and spatial resolution and to link data across various sources.
- **Data verification validation:** Identify and use various primary collected data and published secondary data from peer-reviewed and grey literature to verify and validate produced emission and air quality model outputs. Ensure model robustness through cross-checking, calibration, and validation through multiple iterations.

- **Model building:** Build operational and validated air quality models and link their outputs to human participants in static (e.g. at home address) and dynamic exposure (assigning exposures to other locations outside the residential address only e.g. while travelling) assignment for diverse population groups.
- **Support:** Provide technical support and training to researchers.
- **Documentation:** Create and maintain comprehensive documentation for model development, verification, and validation. Support project reporting and paper writing and submission to peer-reviewed journals.
- **Innovation:** Stay updated with the latest advancements in emissions and air quality modelling, and exposure assignment, to incorporate new technologies and methodologies.

What skills will you need?

- **Education:** PhD degree in a relevant field.
- **Experience:** Proven experience in emissions and air quality modelling and validation.
- **Technical Skills:**
  o Expertise in emissions modelling
  o Expertise in air quality modelling and air pollution dispersion models such as ADMS-Urban and assigning exposures to other locations outside the residential address only
  o Expertise in geographical exposure assignment including for data with high temporal and spatial resolution
  o Practical experience of model building, verification, calibration, and validation
  o Understanding of health effects and health impact assessment methods
  o Proficiency with spatial analysis tools, databases, and libraries (e.g., ArcGIS, QGIS, PostGIS) and programming languages (e.g., Python, R) for GIS applications
  o Proficiency in programming languages such as R, more advanced coding e.g. C++ or Java would be an advantage
  o Knowledge of and interest in the study of air pollution's health effects and its methodological challenges
- **Communication:** Excellent verbal and written communication skills in English, with the ability to convey complex scientific concepts to both technical and non-technical audiences.
- **Research Methodology & Critical Thinking**: Strong foundation in research methodology, critical thinking, and problem-solving abilities
- **Proficiency in Office & Collaboration Tools**: Strong skills in Microsoft Office applications (e.g., Excel, Word, PowerPoint) and familiarity with collaboration tools (e.g., Teams, Slack, SharePoint, GitHub).
- **Independent & Collaborative Work**: Ability to work independently on complex research tasks while effectively collaborating with multidisciplinary teams across multiple institutions and projects.
- **Ethical Research Practices**: Commitment to maintaining high ethical standards in research, including data integrity and responsible conduct.

Preferred Qualifications:

- **Publication & Presentation Experience**: Experience in publishing research in peer-reviewed journals and presenting findings at conferences or academic settings.
- **Database Management**: Experience with database management systems and data warehousing, including the ability to handle large datasets.
- **Knowledge of software development methodologies and best practices.**
- **Familiarity with remote sensing and GPS technologies.**
- **Experience working with sensitive (e.g., personally identifiable) data.**
- **Experience or exposure to environmental epidemiological studies.**

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 comprehensive medical insurance cover as part of your employment.
- Opportunity to work as part of a world-leading scientific research programme.

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

How to apply?

Please apply by uploading your CV and academic transcript to https://jobs.employmenthero.com/jobs/cambridge-cares-air-quality-modeller-ai-researcher-for-hd4-hk-jw-7h79g. If you have any questions, please feel free to reach out to the HR team at recruitment@cares.cam.ac.uk.