

POSTDOC FELLOW POSITION - AI FOR DIGITAL LUNG AUSCULTATION ANALYSES

Term: 1 year full-time position with possible extension for future year(s).

Salary: Commensurate with qualifications and experience

Desired start date: June 1, 2021 (negotiable)

Location: Digital Emergency Medicine, UBC, Vancouver General Hospital campus

Academic Supervisor: Dr. Kendall Ho, UBC Department of Emergency Medicine

Contract Type: Temporary/ Full Time

Note: *We are only accepting applications from Canada/U.S. at this time.*

Summary of the project

The project will focus on the research and development of machine learning algorithms and deep learning methods when applied to digital lung auscultation data and other relevant data. The developed pipelines will be validated using real patient data and rigorous usability test protocols and will be deployed to provide decision support to frontline healthcare providers, once validated.

The research fellow will take a prominent leadership role in refining and conducting the research plan as presented below. The position is highly suitable for those pursuing a research career in advanced data analytics in academic or industry, particularly in the life sciences, but also in other application domains such as electrical engineering and human-interface design.

The research fellow will be co-supervised by an interdisciplinary team led by Dr. Kendall Ho (UBC Department of Emergency Medicine) and Dr. Roger Tam (UBC School of Biomedical Engineering). It will offer a great opportunity for the fellow to collaborate closely with data scientists, health researchers, and clinicians to generate impactful and meaningful outcomes.

Required Qualifications and Experience

Candidates should hold a Ph.D. in Computing Science, Biomedical Engineering, Electrical Engineering, or other related fields. Ideal candidates should have experience working with medical data and analyzing data to predict health states. Qualified individuals will have the following experience and skills:

- Demonstrated competence in the use of computer science, data science, machine learning, and deep learning methods to analyze medical data;
- Practical knowledge in generative models, semi-supervised learning, and interpretable artificial intelligence;
- Experience developing cross-validated models and conducting reproducible experiments;
- Strong familiarity with deep learning toolkits such as Tensorflow and Torch;
- Ability to write structured and annotated code, scripting, run unit tests and debugging;
- Ability to lead the authorship of manuscripts for submission to both clinical and technical journals;
- Ability to effectively use statistical software at an advanced level;
- Ability to work effectively both independently and collaboratively in a team environment;
- Ability to interact productively and professionally with a wide range of internal and external collaborators as well as junior trainees;
- Strong organizational, time management, and project management skills.

Additional desired qualifications:

- Experience working with acoustic, wearable sensor data, and/or medical imaging data.
- Experience managing studies with (ongoing) acquisition of patient data
- Background and knowledge in medical device design, manufacturing and certifications.
- Familiarity with Python, R, MATLAB, and/or SAS (Statistical Analysis Software).

Research Plan

The project is aimed to produce two algorithmic prototypes that will be developed using inhouse and opensource datasets of digital lung auscultation data:

- **Primary:** annotate sound files in terms of disease states (e.g. normal vs. pneumonia)
- **Secondary:** score severity rating of the disease captured by each sound file

The research fellow will execute the following research plan:

I. Literature review: conduct thorough literature review to acquire the clinical and technical background needed to achieve the research outcomes; identify the strengths and limitations of the available inhouse and opensource datasets; perform a detailed assessment on how each dataset could be leveraged for each research outcome listed above.

II. Model development: propose and implement a method for each research outcome and perform rigorous experimentation during the model development phase, which includes the proper set-up of reproducible cross-validation experiments, evaluation of model parameters using various parameters, and documentation of preliminary research results.

III. Usability testing: patient data will be collected in controlled settings to facilitate the testing/validation of the developed algorithm(s). Other members of the study team will facilitate access and approval to work within these settings while the research fellow will take leadership in validating the developed pipelines and produce formal reports to document the test results.

To Apply

Please email Mr. Michael Lim (program manager) at michael.l[at]ubc.ca your application **as a single PDF with subject line "RADAR: postdoc fellow position [your full name]"**.

Your application should include a cover letter, your curriculum vitae, and full contact information of up to three professional references.