Postdoctoral Fellowship: Application of Machine Learning Methods to Synthetic Data Generation

- **Organization**: Children's Hospital of Eastern Ontario Research Institute
- **Senior scientist**: Khaled El Emam
- **Job description**: RI-22-019
- **Posting period**: April 5–May 5, 2022

The CHEO Research Institute (CHEO RI) is one of the leading hospital-based Research Institutes in Canada. The Institute supports hundreds of researchers leading to discoveries that solve health challenges for children and youth in our community and around the world. The CHEO Research Institute conducts internationally competitive research in basic and translational biomedicine, clinical medicine, population health and health services. We focus on excellence in research: supporting a community of committed researchers, helping to secure the resources needed for their work, promoting the practice and recognition of research within CHEO and beyond, and striving towards the beneficial translation of our research to Canadian society as a whole.

The CHEO Research Institute is fully integrated within the Faculty of Medicine at the University of Ottawa, which comprises several research-intensive Departments supporting a vibrant research and educational environment with multiple strong foci in multiple health-related fields. Several health-related students and medical trainees complete portions of their education and training at CHEO.

The **Electronic Health Information Laboratory** (EHIL) was formed in 2005 at the CHEO Research Institute and is headed up by Dr. Khaled El Emam. EHIL conducts multi-disciplinary research to enable data sharing and data simulation. It is located at the Children's Hospital of Eastern Ontario Research Institute. Our research results get applied in practice relatively quickly, so we get rapid feedback from practice to continue improving our work.

EHIL has a research program devoted to facilitating the sharing of electronic health information for secondary purposes while protecting the privacy of patients and the identity of providers.

EHIL develops technology to facilitate health data sharing, including data synthesis methods, de-identification methods and secure computation methods to allow public health surveillance and analysis without compromising privacy. The different methods are suitable under different circumstances and constraints, from individual-level data release, to on-going surveillance, and to interactive remote analysis.

The Electronic Health Information Laboratory (EHIL) is seeking one **postdoctoral fellow** to join our research program for at least one year. The research topic is synthetic data generation (SDG) using statistical machine learning and deep learning methods. This includes the development of new SDG methods, evaluating the utility and disclosure risk of the synthetic datasets, plus developing new utility and privacy metrics.

Main responsibilities

- Using machine learning techniques to generate synthetic data from real world data (RWD) and clinical trial datasets.
- Developing and improving synthetic data generation methods.
- Performing statistical analysis of clinical trial data according to establish analysis plans.
- Liaising with trial investigators as necessary to discuss the trial protocol and the statistical analysis plan.

Qualifications

- A recent PhD in statistics, computer science, applied mathematics, engineering, epidemiology or a similar discipline.
- Good knowledge of R and/or Python, and ideally PyTorch;
- Previous work in statistical disclosure control, developing and evaluating machine learning models;
- Ability to set priorities with competing and shifting demands;
- Willingness to learn and adapt to new policies, procedures and requirements;
- Ability to be flexible with working hours in order to meet deadlines.

Position type

Full-time, 1 year contract with possibility of renewal.

Salary

Will be commensurate with skills and experience.

Language requirements

English essential.

Other requirements

- Eligible to work in Canada;
- Valid police record check;
- Compliance with CHEO RI's Universal COVID-19 Vaccination Policy.

The CHEO Research Institute is committed to ensuring equity, diversity and inclusion in the scholarly and leadership environments of our students, staff, and faculty. The CHEO Research Institute values diversity and is an equal opportunity employer. We are committed to providing an inclusive and barrier-free work environment, starting with the hiring process and welcome interest from all qualified applicants. This competition is a preferential hiring, which gives priority to one or more of the designated groups. Accordingly, we strongly encourage applications from members of the four designated groups, such as Indigenous peoples, visible minorities, persons with disabilities, and women, as defined in the Employment Equity Act, as well as from all qualified candidates with the skills and knowledge to productively engage with equitable, diverse and inclusive communities. As part of this preferential hiring process, applications from members of the four designated groups will be prioritized and assessed first for the vacancy.

Should the applicant require any accommodations during the application process, please notify Human Resources as per the Accessibility for Ontarians with Disabilities Act at researchhr@cheo.on.ca.

Application process

Interested Applicants are invited to submit an application to Elizabeth Jonker at ljonker@cheo.on.ca.

We thank all applicants for their interest, however, only those invited for an interview will be contacted.