

## **POSITION: Research Fellow (Machine Learning and Signal Processing)**

### **POSITION SUMMARY**

The specific research endeavours for this position will involve the research and development of lab-on-a-chip biosensor platforms capable of rapidly detecting specific nucleic acids, proteins, cells or metabolites in body fluids (including blood, saliva, nasopharyngeal specimens). The results can be used for disease diagnosis, monitoring disease activity, or treatment selection. The research aim is to develop a portable device that can be used at the point-of-care by minimally trained individuals.

The Research Fellow will join a multidisciplinary team of researchers and postgraduate students under the supervisor of senior researchers. Through interacting closely with other research personals who are working on the molecular biology and bio sensors aspects, you will be responsible for the signal processing engineering aspects of the research including, but not limited to, perform machine learning (ML), deep learning (DL) to process complex signals generated from electrochemical biosensors, create ML algorithms to automatically predict/detect species or target biomolecules. A highly motivated Research Assistant with strong skills in **machine learning and electrochemical sensor signal processing** are essential criteria.

### **DUTIES AND RESPONSIBILITIES**

- Conduct machine learning (ML) research to process electrochemical signal for the use of point of care biosensor platform.
- Perform ML to analyse the raw sensing data from a biosensor for the use of
  - Categorization: sort/ categories the signals based on the target
  - Anomaly detection: detect the sensor performance variations due to biofouling or interferences
  - Noise reduction: train ML models to distinguish the signal from the noise
  - Object identification and pattern recognition.
- Employs ML methods to extract maximum information of the bio sensor event.
- Work interactively with molecular biology and electrical engineering researchers to analysis biosensor data.
- Undertake literature reviews, maintain documentation of research, (e.g. experiment protocols, lab books, research reports)
- Assist in the preparation of annual and/or quarterly reports, and of submissions for intellectual property protection
- Other duties as directed by the supervisor

### **KEY CAPABILITIES**

#### **QUALIFICATIONS/EXPERIENCE REQUIRED**

##### **Essential**

- A Master/PhD degree in a relevant field (e.g. electrical and computer engineering, biomedical engineering, computer science), or substantial relevant skills and work experience
- Experience in machine learning with appropriate programming skills
- Excellent organisational skills
- Strong written and oral communication skills
- Ability to work both independently and as part of a team
- Demonstrated ability to problem solve and to use initiative as appropriate

##### **Desirable**

- Experience in perform machine learning (ML) to process biosensor/imaging signals
- Experience in data modelling and data analysis automation
- Experience in electrochemical signal processing research and development
- Software engineering skills

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