Research Fellow (Discrete-event Simulation / Explainable Reinforcement Learning / Pharmaceutical Production)- FHK2
Singapore Institute of Technology

Job Title	Research Fellow (Discrete-event Simulation / Explainable Reinforcement Learning / Pharmaceutical Production)- FHK2
Department	Chemical Engineering and Food Technology
Institution	Singapore Institute of Technology Singapore, , Singapore
Date Posted	Feb. 2, 2024
Application Deadline	Open until filled
Position Start Date	Available immediately
Job Categories	Research Scientist/Associate
Academic Field(s)	Chemical/Petroleum
Job Website	https://careers.singaporetech.edu.sg/cw/en/job/498557/research-fellow-discreteevent-simulation-explainable-reinforcement-learning-pharmaceutical-production-fhk2
Apply By Email	

Job Description

Research Fellow (Discrete-event Simulation / Explainable Reinforcement Learning / Pharmaceutical Production)- FHK2

Job no: 498557
Department: Chemical Engineering and Food Technology
Contract type: Contract
Apply now

Research Fellow (Discrete-event Simulation / Explainable Reinforcement Learning / Pharmaceutical Production)- FHK2

Singapore Institute of Technology

As a University of Applied Learning, SIT works closely with industry in our research pursuits. Our research staff will have the opportunity to be equipped with applied research skill sets that are relevant to industry demands while working on research projects in SIT.

This role is funded by a Pharma Innovation Programme Singapore (PIPS) research grant. The primary responsibility of the role is to deliver a novel software solution, which supposedly will run on discrete-event simulation (DES) and deep reinforcement learning (DRL) optimization algorithms, to help pharmaceutical companies enhance the agility of their multi-product manufacturing process in an uncertain environment. To this end, by working closely with subject matter experts from the PIPS member companies (i.e., GSK, MSD, Pfizer, and Syngenta), you will:

- design and execute survey / interviews with subject matter experts to understand the agreed aspects of agility and use them as the basis for this project
- develop the DES model libraries on the AnyLogic? platform to simulate different kinds of activities involved in the full pharmaceutical supply chain
- develop the DES plant model optimizer using explainable DRL algorithms with user-defined objective functions
- demonstrate the utility against company-supported use cases
- prepare a user manual to help the companies quickly grasp the knowledge to use or modify the novel utility

Key Responsibilities:

1. Participate in and manage the research project with Principal Investigator (PI), Co-PI and the research team members to ensure all project deliverables are met.
2. Undertake these responsibilities in the project:
    i. visit PIPS member companies' production sites in Singapore for data collection and model building
    ii. train and validate the DES models using historical plant data or synthetic data
    iii. develop the DES model optimizer by implementing appropriate DRL algorithms and user-defined objective functions (e.g., CAPEX/OPEX, sustainability metrics, etc.), with explainability on the suggested decisions from the algorithms
    iv. present research findings in meetings with PIPS member companies; prepare peer-reviewed publications on the findings
    v. guide junior researchers and undergraduate students on their research activities

Research Fellow (Discrete-event Simulation / Explainable Reinforcement Learning / Pharmaceutical Production)- FHK2

Singapore Institute of Technology

vi. engage and communicate with vendors/suppliers for purchasing software, and visit vendors' facilities for both software evaluation and training purpose.

3. Carry out Risk Assessment, and ensure compliance with Work, Safety and Health Regulations.

Job Requirements:

1. PhD in Chemical Engineering, Computer Science / Engineering or related fields. Master's degree candidates with significant computational research experience may also be considered.
2. Previous experience with DES / Deep learning using neural networks / DRL / Explainable machine learning / AnyLogic would be advantageous.
3. Interest and enthusiasm for academic research to be applied in the pharmaceutical industry.
4. Good interpersonal, communication and technical writing skills. Good problem-solving skills.

Apply now
Advertised: 02 Feb 2024 Singapore Standard Time
Applications close: 30 Jun 2024 Singapore Standard Time

Contact Information

Please reference Academickeys in your cover letter when applying for or inquiring about this job announcement.

Contact

Singapore