Sheridan | Centre for Mobile Innovation

Student Research Opportunities -- Centre for Mobile Innovation (CMI) Research Projects

Part-time Position

Job Title: Machine Learning Data Analyst; Computer Vision

Industry Partner: Karmy Pain Clinics
Key Role: co-mentorship

Principle Investigator: Prof. Rachel Jiang
Area of expertise: Computer Vision

HQP: key skills sets: Machine Learning; Data Analysis

Project Summary:

The description of the *CMI-Karmy Project*.
Research, develop and evaluate an automated chronic pain diagnostic system to output a computer diagnosed pain score with the abilities of distinguishing real pain from malingering pain descriptions. The system will enhance patient care and improve clinical practice efficiency compared to current use of the manual Facial Action Coding System (FACS) procedure. The most advantaged 3D technologies and Artificial Intelligence (AI) algorithms will be applied on face expressions and body motions from both 2D and 3D data. Microsoft Kinect devices will be used to capture RGBD data for tracking face expressions and body motions in 3D. Deep learning neural networks for classifying the pain scores in 3D, especially on body motions and gesture analysis will be one of the main tasks.

Future Enhancements, if time permits, as the project unfolds.

Time and Schedule:

- 10 h / Week
- 60% - 70% - Face-2-Face Teamwork (remote work due to COVID)

Dates:

- Jan 11, 2021 to Apr 23, 2021 (excludes reading week)

Remuneration:

- $16.5 - $20.55 / hour depending on experience and qualifications.

Technologies:

- C#/Java/C++
- PowerShell Scripting
- MATLAB
- TensorFlow
- Neural Networks

Responsibilities:

- Research emerging technologies, frameworks and techniques relevant to the research project
- Research and review literature as required by the research project
- Research 3rd party components that can be reused in the project
- Software development, software design, modeling and requirements analysis
- Test, debug and troubleshoot software applications developed for the research project
- Estimate and plan tasks that meet agreed upon deadlines
- Participate in team-meetings, prepare, participate in presentation meetings and communicate with industry partners under the supervision of the PI
- Work Face-2-Face with the team for the majority of the time dedicated to the project

Job Requirements (Required):

- Demonstrable experience developing universal applications capable on working on multiple device types (e.g. mobile, tablets and large-screen devices) using React Native, iOS App Development using Swift, Android App Development.
- Demonstrable mobile app development on Android and iOS platform
- Demonstrable knowledge of professional development practices, best-practices, using debugging techniques, unit-testing and software version control.
- Experience in designing and/or analyzing design visualized using UML
- Interest in developing healthcare mobile software systems
- Can-do attitude, resourceful, demonstrates initiative, creativity and passion for purposeful, result-oriented research
- Minimum 1 year academic experience in the Mobile Computing Degree program or 2 years and relevant COOP experience in a related diploma program.

Job Requirements (Beneficial / Good to have assets):

- Experience developing native applications
- Multi-threaded programing experience
- Experience in software modeling using Visual Paradigm
- Experience in communication using team tools such as MS Teams
- Experience in project planning and management using agile management tools such as Asana, MS Teams, BitBucket, Github, Jira, etc.
- Interest and experience in UI design, graphics and digital media design