9th QI Artificial Intelligence Development Project – Winter 2022

Venue: Qualcomm Institute (QI), the University of California, San Diego
Dates: 4th February – 27th February, 2022

PI Information

Seokheon Cho, Ph.D.
Principal Network Architect,
Qualcomm Institute, University of California, San Diego.
s5cho@eng.ucsd.edu

Executive Summary

The specialized hands-on project in Artificial Intelligence Methods will introduce participants to the subject matter using various tools, such as big data collection, pre-processing, modeling, analysis, distributed computing, and visualization.

Artificial Intelligence provides the ability to automatically learn and improve their performances from experience without explicit programming. As computing power increases, the demand on learning and estimation algorithm development expands, and the cloud for big data storage rises, the importance of Artificial Intelligence Methods is dramatically magnified.

The QI Artificial Intelligence Development Project specifically aims at researchers and developers interested in learning more about how to analyze bid data collected from various application fields, such as energy, air quality environment, transportation, health, and so on.

A participant completing this project successfully can build up significant skills needed in Artificial Intelligence career track. Courses comprise of theoretical and practical skills, which can improve processing and analysis abilities for big data. Furthermore, this project is designed and classified to train participants in the field of Artificial Intelligence itself as well as coordinating with multidisciplinary studies and industrial practices.

Project Experience

The QI Artificial Intelligence Development Project is an intensive, practical, and comprehensive hands-on project consisting of technical lectures, review sessions, office hours, technical seminars, social events, weekly presentations, and final demonstration. This project offers a series of lectures on collection, pre-processing, modeling, analysis,

distributed computing, and visualization for big data. In this QI AI development project, the participants will learn how artificial intelligence algorithms work in real life so that they can better understand the pros and cons of a variety of AI/ML algorithms, and realize how to use which algorithm for each application field and how to tune algorithms so as to enhance an efficiency and capacity of the interested IoT system. In particular, as a branch of AI, Deep Learning neural networks will be covered.

As well as the theorical concept of Artificial Intelligence, the participants will be familiar with the programming tools used to analyze big data and make inferences with machine learning and deep learning algorithms, which are KNIME, Python, TensorFlow, Keras, or Theano. The Bokeh, Tableau, or Apache Zeppelin used for the visualization of the analyzed results will be also covered.

The participants will be challenged to complete the assigned responsibilities and roles, and to work together for a final group task by utilizing theoretical and practical skills learned throughout the lectures. Also, they will have the opportunity to ask questions and seek help in office hours. To measure and review their acquisition of new skills and competencies, they will present their progress every week. By the end of the project, participants will be able to understand the theory of how artificial intelligence algorithms including deep learning algorithms work, notice which algorithm is better fits for in real world fields, and improve their prospects for the state-of-art AI techniques.

Through this project, participants will have the opportunity to experience and tap into the various resources of one of the top universities in the world, UC San Diego. As part of the project, participants will be working among UC San Diego faculty, staff, and students, and have the chance to meet and collaborate with highly respected experts in the field. Participants will also have access to seminars and workshops hosted by the Qualcomm Institute and UC San Diego.

Project Requirements

It is required that every participant brings his or her laptop for this project.
All outcomes from this project will belong to Qualcomm Institute, UCSD. However, we strongly expect that this project will be a good opportunity for the participants to improve their ability to analyze big data and thus develop services based on analyzed results.

Cost, Eligibility, and Admission Requirements

The cost of QI AI Development Project is $3,500 per person. Costs include lectures, technical review sessions, all materials, special events, and social activities.
The project requires participants to possess the following skill sets:
- Basic mathematical knowledge such as linear algebra and probability
- Basic software tools such as Python and Java