Theme: Computing Architecture for Data Analytics

- Sub Theme: Efficient Algorithm and Processor Architecture for Data Mining/Analytics of Massive IoT Data

Recently IoT is gaining popularity as a key technology that enables smart factory, intelligent building, smart home and connected cars. Data mining/analytics is the necessary process of extracting valuable, interesting and unexpected information in large datasets collected from these IoT devices. Until now, massive data from these IoT devices are sent to the cloud for the big data analysis. However, this may not be feasible sooner or later due to the tremendous amount of raw data size. In addition, because of the privacy and latency issue, edge computing (in the local server not the cloud) might be an alternative solution even for the big data analysis of IoT area. On the other hand, conventional data mining methodologies consist of three sub-steps such as data preprocessing, data mining and data interpretation, and algorithm for data mining step could be varied for the analysis purpose (such as data classification, clustering, association and so forth). All these steps are processed with various algorithms requiring different computation and memory usage, which makes building a unique computing architecture for big data analysis difficult.

We are aiming to make a special processor architecture that outperforms existing CPU and GPU for the various data mining/analytics techniques. The first solution might be finding a novel intelligent algorithm (such as deep learning based end-to-end algorithm) that can replace the traditional machine learning-based techniques. Another possible option could be extracting common computing features from various data mining algorithms to expedite performance with the dedicated hardware. These new approaches may enable

us to make common hardware accelerator or processor architecture for this area.

- New noble algorithm (such as deep learning) and processor architecture for various data mining techniques like classification, clustering, association, sequencing, forecasting and so forth
- Extracting common computing features from the existing data mining techniques and the corresponding processor architecture.

※ The topics are not limited to the above examples and the participants are encouraged to propose original idea.

※ Funding : Up to USD $200,000 per year