Theme : Artificial Intelligence

Subject : Cognitive Scene Understanding and Applications

Introduction

The goal of this research subject is to explore novel methods and potential killer applications of CSU (Cognitive Scene Understanding) for mobile devices. CSU will enable advanced vision recognition by autonomous machines for making proper decisions on their own, just like human brains. It may be integrated with Cloud infrastructures and Big Data analytics to continuously update and to deepen its core knowledge base.

Main focus of the project will be developing practical CSU-based techniques and services in the mobile realm. An intelligent system equipped with various image sensors may extract meaningful patterns to build contextual information for each user. The contextual information may be further enriched with additional sensor modalities to be exploited in future services such as authentication, prediction, and so on.

Scope

Challenges that significantly advance CSU and find new applications include:

- Concepts and methods for overcoming current limitation of CSU implementations
- Concepts and methods for power-efficiently implementing CSU to smartphones and wearable devices
- New mobile application areas that can fully benefit by CSU

Research questions

We are interested in the following research questions. These questions are not exhaustive but different research questions are open to discuss with research partners.

- What would be main technical obstacles and promising scenario for employing CSU in the mobile arena?
- What would be the most promising method for a mobile device to autonomously learn context incorporating the environment with limited prior knowledge?
- What would be the most power-efficient method to apply CSU into mobile devices?

Expected Deliverables

The following is open to discussion:

- CSU algorithms and implemented source codes which are written by C/C++
- Design documents which include S/W and algorithmic details
- Top conference papers with Samsung (If agreed, CVPR, NIPS, and ICML.)
- Patents with Samsung (If agreed)
- Detailed quarterly progress reports summarizing accomplishments