Machine Learning Applications on Android Smart Glasses

Project Description

More and more technology companies are taking interest in the market of Wearables, and every year new devices are pushed onto the market, offering new exciting functionalities. The severe energy constraint dictated by the battery size of these devices poses many challenges from the implementation point of view, but it is also a great innovation driver, both on the hardware and software sides.
Smart glasses are an emerging wearable platform with challenging constraints, but a lot of potentials.

Your task in this project will be to develop an energy-efficient Machine Learning application, expanding the functionality of the platform. The application will target a development platform based on Qualcomm's W4100 SoC for wearables and will take advantage of the sensors available on the board (camera, microphone, IMU).
Attention will be given to energy-saving techniques and the use of the accelerators available on the SoC.
The implementation will then be profiled (and possibly compared with a newer platform, e.g. W5100).
Possible applications, depending on the student's interest:

- Sign Language Translation
- Face Detection/Identification
- Speech-to-Text/Translation
- Stress detection and Sleeping alert for Drivers
- Ideas from students are welcome!

Requirements / Knowledge in...

- Android App Development (Kotlin/Java)
- Machine Learning (Tensorflow, Pytorch)
- Machine Learning Accelerators (interest in the topic)

Type of work

- 30% Literature Study
- 60% Implementation/Development
- 10% Profiling and Documentation

Subject area

Wearables, Android, Machine Learning, Computer Vision

Thesis Type

Bachelor Thesis, Semester Thesis, Master Thesis

Supervisors

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References

[1] R. Rastgoo et al., Sign Language Recognition: A Deep Survey - ScienceDirect
[2] Ren et al., SimulSpeech: End-to-End Simultaneous Speech-to-Text Translation - ACL Anthology