Reducing Energy Consumption of smartphones Using User-Perceived Response Time Analysis

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Problem statement

- In most cases, a user tends to focus on one app at a time although multi-tasking support is commonly available for modern smartphones.

- For smartphones, most users have a tendency to interact with the smartphones in a hurried fashion so that they subjectively decide that the smartphones are ready for the next interaction even though the task execution has not been fully completed.

Solution approach

- Propose such a definition of the response time, which they call the display-centric response time, which as known to be a critical metric for the quality of user experience of the smartphone.

- Propose a novel CPU power management framework based on on-line user-perceived response time analysis.

- Based on uras on-line identification of the display-centric response time, their proposed framework enables more aggressive low-power techniques to be employed while executing display-insensitive parts of task executions (which do not affect the user-perceived response time).

Strong points

- Their proposed CPU power management framework allows more aggressive low-power techniques to be applied to smartphones.

- Their proposed oninterval governor could make aggressive DVS decisions without any negative effect on user experience.

Weak points / Limitations

- This paper didn't focus on different system components such as memory subsystem and network interfaces.

Questions

- When user using cloud service like a IaaS, the author's proposal is appropriate about energy consumption?

New ideas / Comments

- As the 5g is commercialized, it is expected that the battery will be consumed as the app becomes heavy. I think these proposals are good proposals for 5g commercialization.

- I think their current ura-based power optimization framework can be further extended to manage the energy consumption of different system components such as memory subsystem and network interfaces by exploiting the user-perceived response time.