

Locy: Energy-efficient sensing with Android smartphones.

Martin Kukla (Supervisor: Dr Tristan Henderson)



Introduction

- Phone sensing may be utilized by mobile applications to provide **advanced services** such as navigation systems.

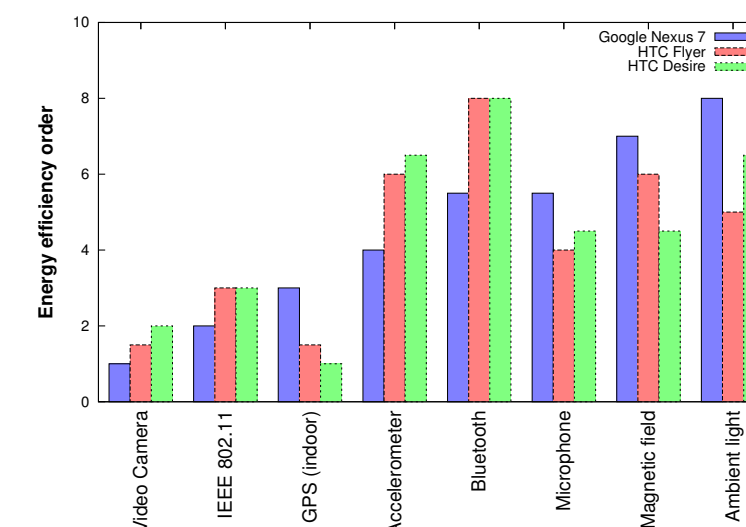


- **Phone sensing** fetches raw sensor data (e.g. from an accelerometer) and tries to extract high-level information from it (e.g. a user is walking).
- Phone sensing has **high energy demands**, which is crucially important to mobile phone users.
- To solve the problem:
 - investigate many devices.
 - establish the energy efficiency of their sensors.
 - leverage results for energy-efficient sensing.
 - build **Locy**, an energy efficient sensing library.

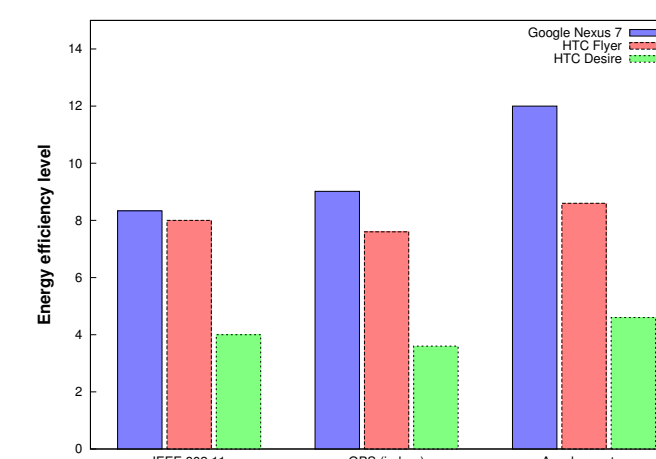


Solution

- Energy efficiency of sensors is **different among the devices**.



- For all mobile phones, **accelerometer is more energy-efficient** than the standard localization sensors.



- Locy is an energy-efficient sensing library:
 - if a user is not moving, it switches off high-power GPS.
 - a user movement is detected basing on energy-efficient accelerometer (the standard deviation of the total magnitude over accelerometer data). [GRAPH]
 - the library uses duty-cycling sampling (it samples and sleeps on repeat).

- duty-cycling ratio (sampling time over sleeping one) is adjusted depending on the battery life of a mobile.

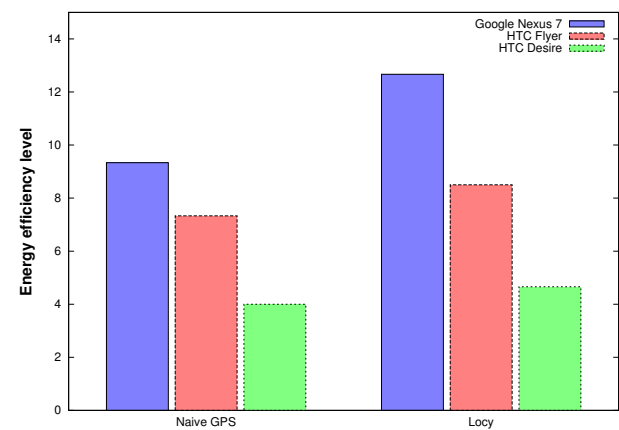
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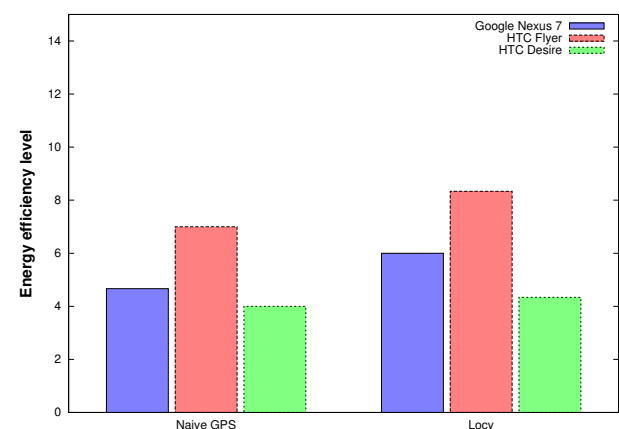


Evaluation

• the first scenario:



• the second scenario:



XXX explain

Conclusions

Locy is more energy-efficient than the standard Android implementation.

