

SensingKit: A Multi-Platform Mobile Sensing Framework for Large-Scale Experiments

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<http://www.sensingkit.org>

Introduction

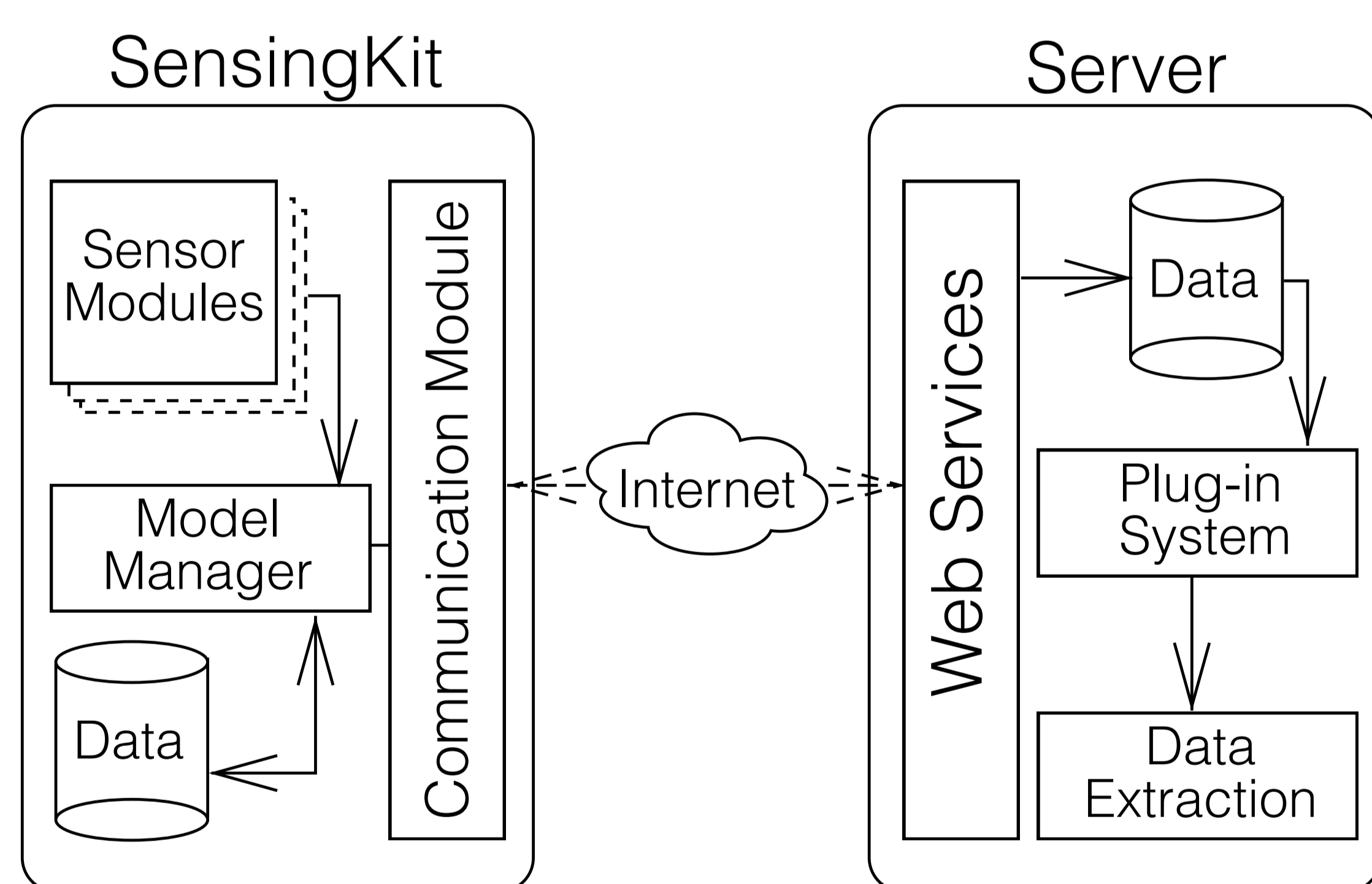
Motivated by the lack of a universal, multi-platform library, we present SensingKit, an efficient, open-source, client-server system that supports both **iOS** and **Android** mobile devices. SensingKit is capable of continuous sensing the device's **motion**, **location** and **proximity** to other smartphones and transmit the data to a server for further analysis over any Internet connection. We believe that this platform will be beneficial to all researchers and developers who need to perform mobile sensing in their applications and experiments.

Platform Characteristics

- Works in Android and iOS mobile systems.
- Captures Motion, Location and Proximity.
- Power efficient using Bluetooth Smart (4.0).
- Easily extensible using a modular design.
- Automated time sync and data processing on the server.
- Available in open-source under the GNU LGPL v3.0.

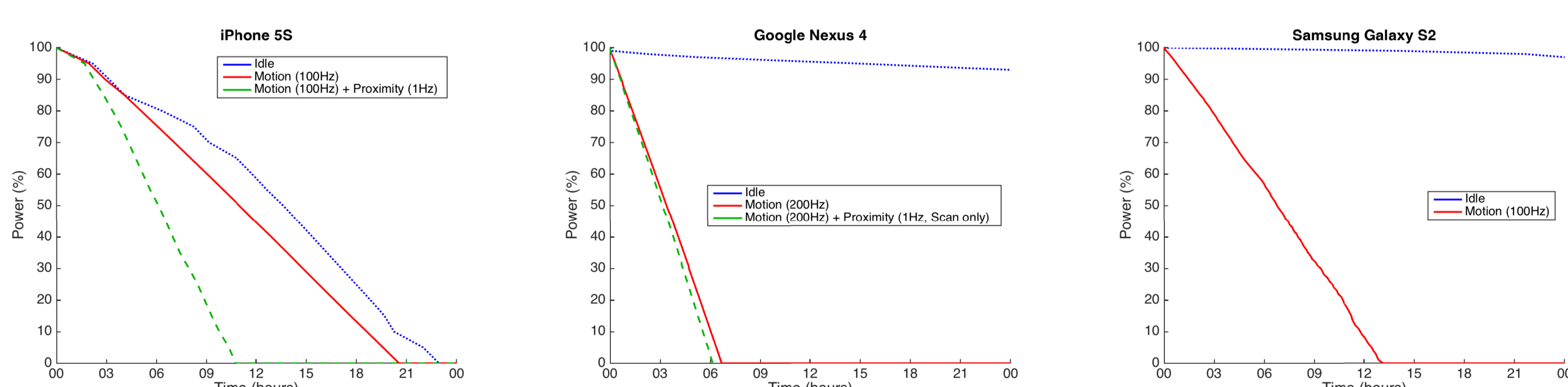
Platform Architecture

SensingKit consists of two separate frameworks: the **client library**, located in the users mobile devices and the **server framework**.



SensingKit System Architecture

Power Consumption

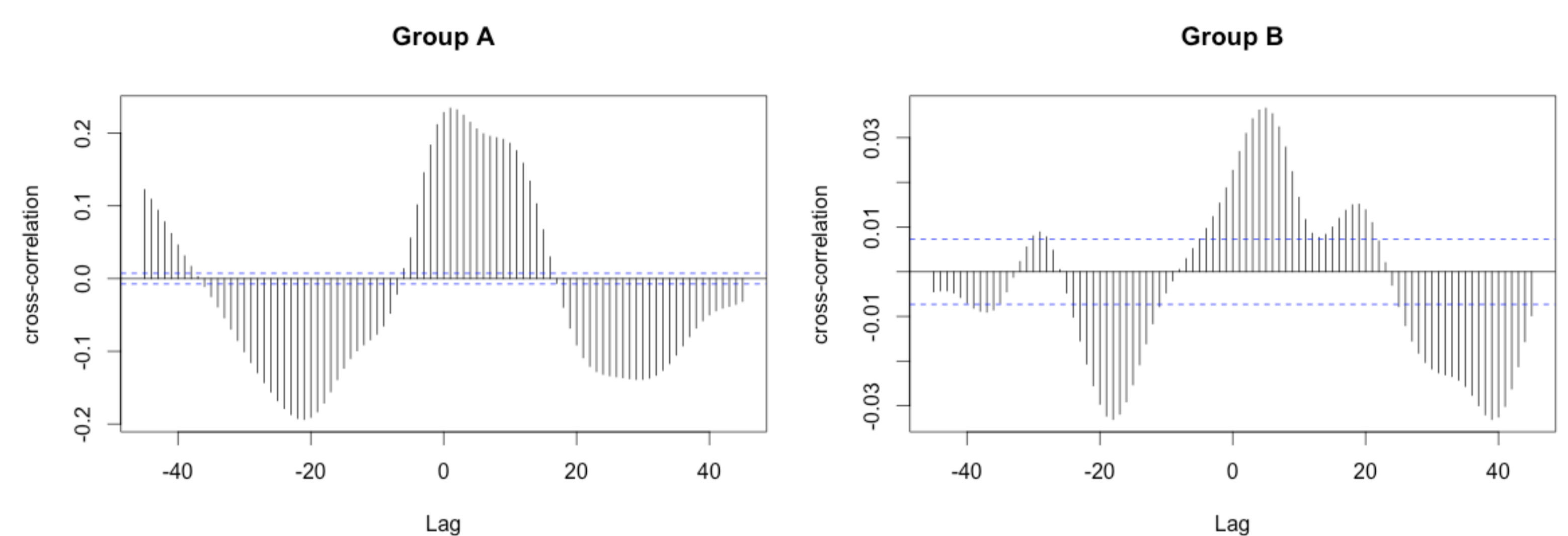


Battery consumption of SensingKit running on an iPhone 5S, Google Nexus 4 and Samsung Galaxy S2 smartphone.

Comparison of Walking Acceleration

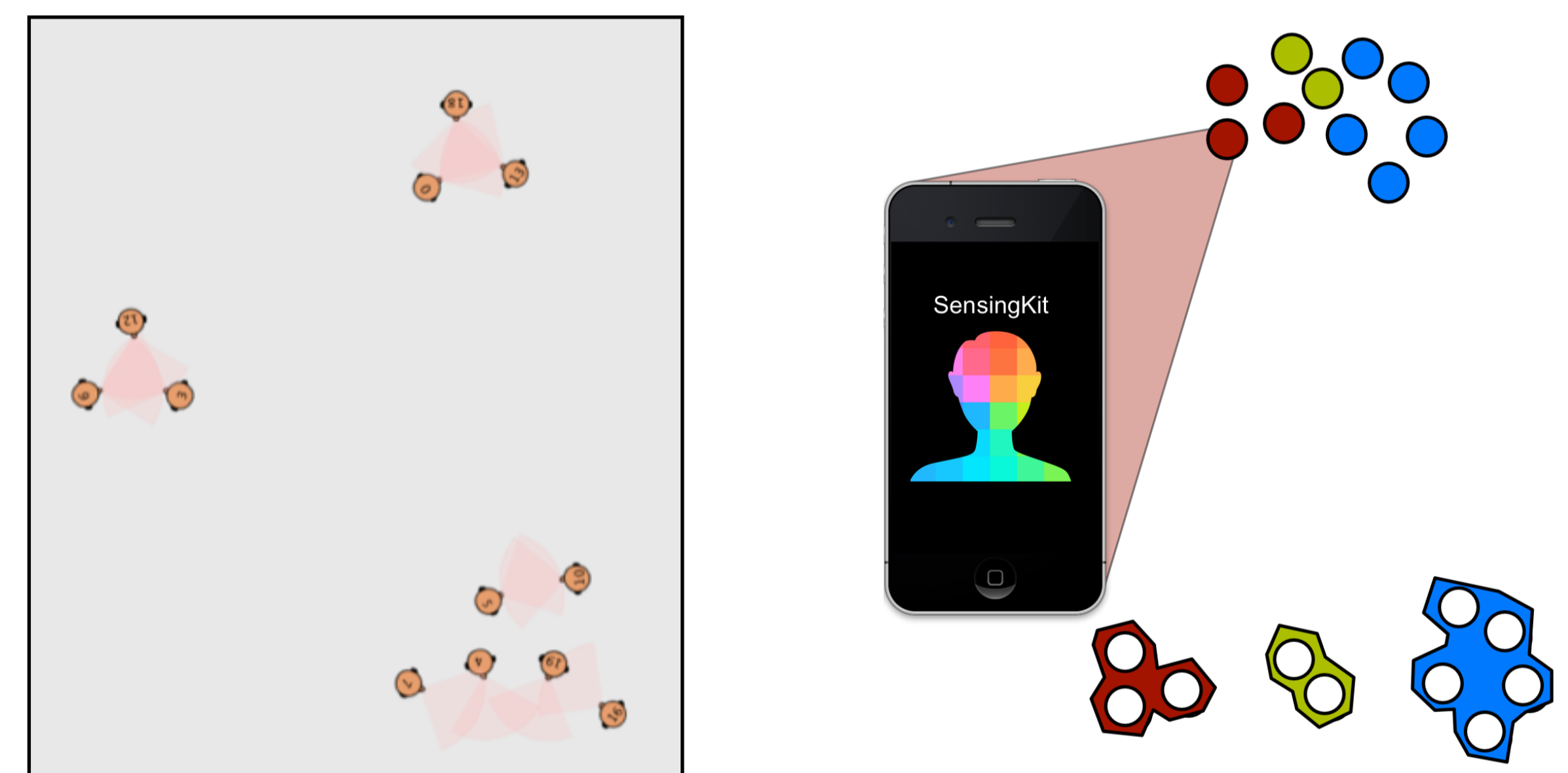
- We used SensingKit to capture the motion of two groups of people during a 10 minute walk in a park.
- Group A: 2 participants vs. Group B: 3 participants.
- We compared the motion (Acceleration in 100Hz) of two of the participants in each group.
- Preliminary results show that the presence of a third person highly effects the step synchronisation.

Results of Pilot Study



Cross Correlation Analysis of two vs. three people.

Future Work



Multi-sensory modelling of different qualities of social interactions. (Narasimhan, 2014)

References

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Acknowledgements

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