

AOBAKO: A Testbed for Context-Aware Applications With Physicalizing Virtual Beacons

Tsubasa YUMURA^{†‡}, Masatoshi ENOMOTO^{†‡}, Kunio AKASHI^{†‡}, Futoshi HIROSE[‡],
Tomoya INOUE^{†‡}, Satoshi UDA[‡], Toshiyuki MIYACHI^{†‡}, Yasuo TAN^{†‡}, Yoichi SHINODA^{†‡}

[†]National Institute of Information and Communications Technology (NICT)

[‡]Japan Advanced Institute of Science and Technology (JAIST)

Download

PDF



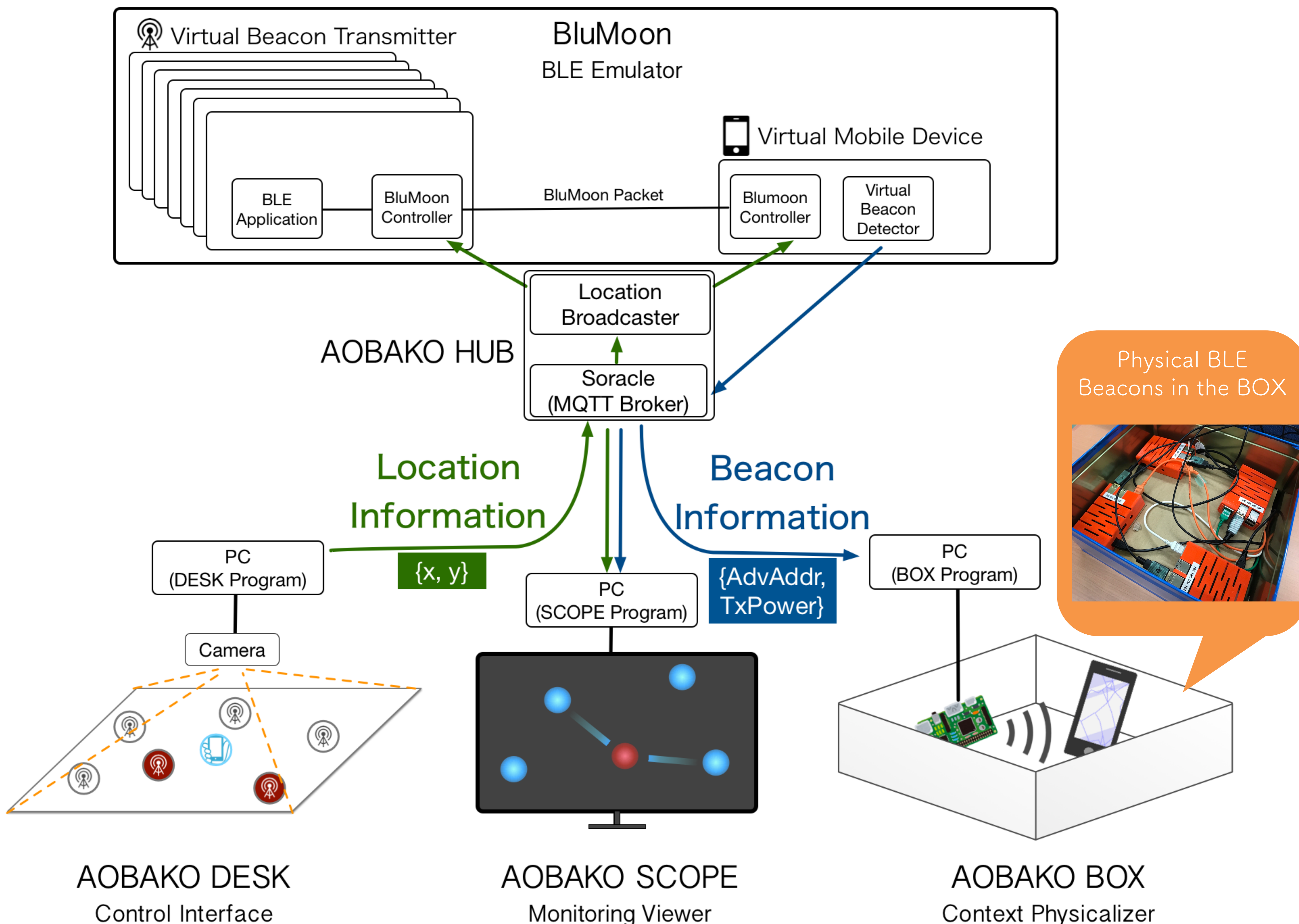
Password: aobako

Contact: yumu@nict.go.jp

Abstract

- AOBAKO is a test platform for mobile applications which receives Bluetooth Low Energy (BLE) beacons.
- There is many smartphone applications using BLE beacon such as indoor navigation or stump rally, however, it is so hard to set actual beacons for application testing.
- Move these pieces and decide the position of BLE beacons and a smartphone in the situation you want to test.
- AOBAKO emulates BLE-beacon communications based on accurate frame-level emulation.
- The emulation result is transferred to a physical space and beacon frames are emitted via radio waves.
- A mobile device which is put in the BOX can receive the beacon at the situation.
- AOBAKO makes it possible to verify context awareness in a mobile application and can reduce the cost of a field survey.

- BluMoon accurately emulates frame-level BLE communications.
- An emulated virtual-beacon frame is transmitted as a UDP datagram in a wired network.



- AOBAKO DESK interface is used to input the positions of a beacon transmitter and mobile device to BluMoon.
- To calculate absolute coordinates, icon positions are captured using a camera.

- Blue lights indicate a virtual-beacon transmitter.
- Red lights indicate a virtual mobile device.
- A bullet is fired from the transmitter to the receiver.

- AOBAKO BOX physicalizes beacon frames based on the beacon information generated by BluMoon.
- The physical beacon transmitter comprises four Raspberry Pi computers installed in the box