Demo Outline:
A Wearable Device for Online and Long-Term ECG Monitoring

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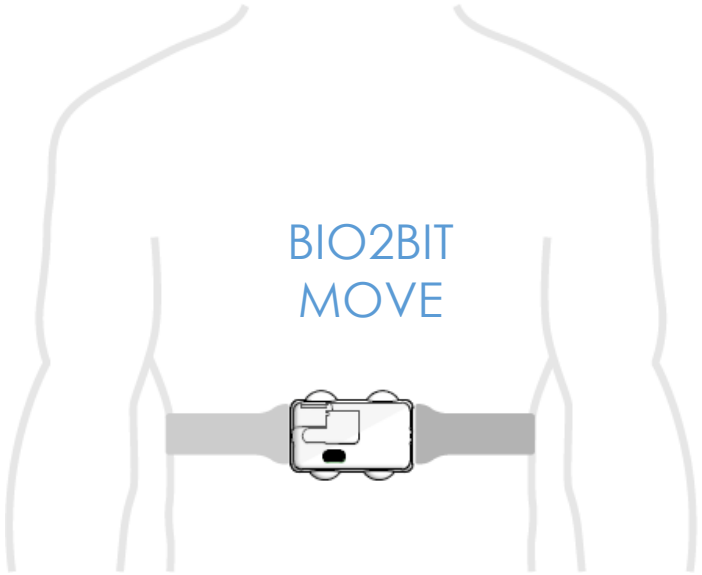
Demo Outline

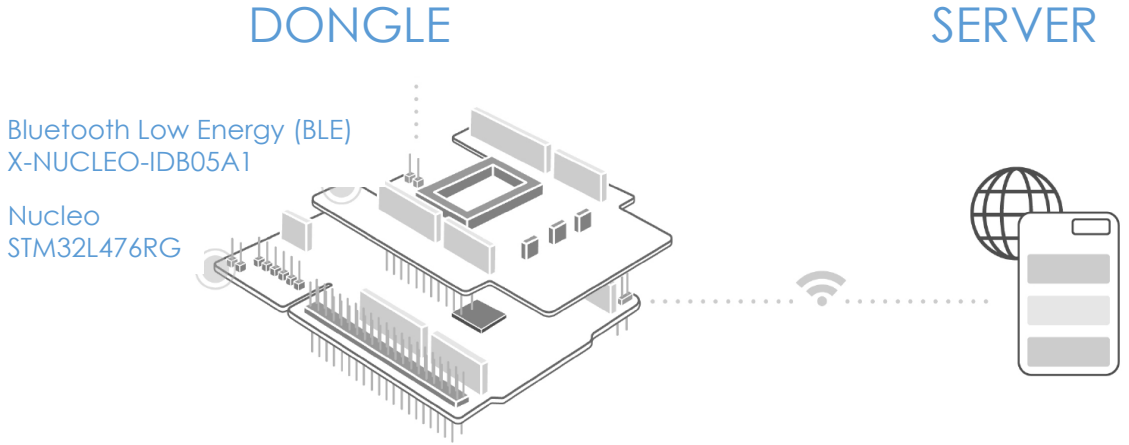
Our demo will present the prototype of Bio2Bit-Dongle, a wearable device to perform online monitoring of ECG signals and automatically detect anomalous heartbeats.

The demo will be structured in the following phases:

1. Description of the system
2. Presentation of the demo modes
3. DEMO: Training phase
4. DEMO: Monitoring phase
5. DEMO: Domain Adaptation phase

Description of the System





1. We present the acquisition system:

- the Bio2Bit Move is a non-invasive wearable device mounted over a flexible chest strap equipped with ECG snaps.
- The dongle is a development board equipped by a BLE evaluation board. For this demo, we have added to the board a display with an interactive menu. Instead of a server/smartphone, we use a laptop.

The Demo Modes

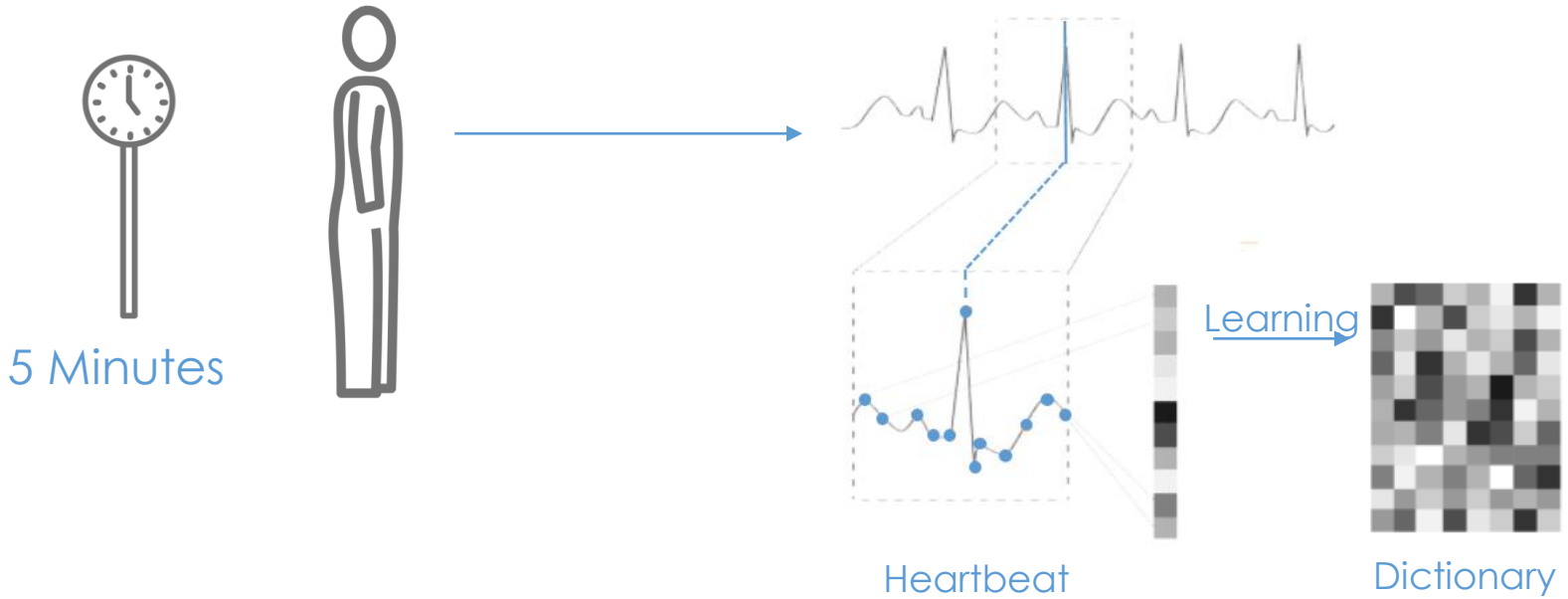
2. We describe the demo modes: our demo is interactive.

Three modes are possible:

a. We describe our work using the video feeds and the supporting slides (less interactive)
b. We wear the Bio2Bit Move ourselves and show the demo to the attendees
c. We ask the compliant attendees to wear the Bio2Bit Move and test her/himself the Bio2Bit functionalities (most interactive)

The Training

We show the dictionary learned to represent normal heartbeats of the user that is waring the device.
Dictionary columns portray the morphology of user's heartbeats

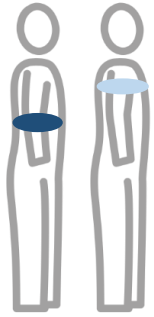


3. The user wears the Bio2Bit Move and the ECG is acquired in resting conditions

4. We show the acquired heartbeats and the learned dictionary on the dongle display

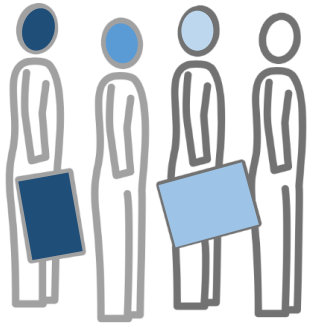
The Monitoring

We illustrate the anomaly detection algorithm and show that the learned dictionary is position-specific and user-specific.



5. We ask the user to change the position of the Bio2Bit Move

6. We show on the dongle display that our system detects anomalies



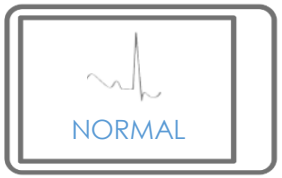
7. We ask another compliant user to wear the Bio2Bit Move (or we upload a dictionary from a different user)

8. We show on the dongle display that our system detects anomalies

The Domain Adaptation

We demonstrate that our system can track heart rate variations using by our transfer learning algorithm

9. We ask the compliant user to work out to increase the heart rate



10. If we enable the domain adaptation functionality, we show on the dongle display that our system does not detect anomalies

11. We display on the PC how the heartbeats change when the heart rate increases