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EAGER: Events of Interest (Eol) Capture Using Novel Body-worn Fully-passive Wireless Sensors for S&CC

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Current State and Challenges:

- High incidence of chronic disease, particularly among African Americans, and high rates of unnecessary or avoidable hospital visits in Memphis.
- High use of smart phones among urban African Americans but low likelihood this population will use technology for health communication.
- Smart phone technology has limited integrated sensors and significant gaps in ability to collect clinically important physiological signals.

Proposed Solution:

- Deliver wireless, battery free body-worn WRAP sensors (Fig. 1) to allow multi-modal clinically relevant data capture.
- Develop an open-source framework for Events of Interest (Eol) classifiers via a smart phone app for self-monitoring and secure knowledge sharing with S&CC.
- Deploy the sensor platform in a "Living Lab" pilot study. Data will be collected and classified in real-time to generate Eols for multiple health conditions (Fig. 1).

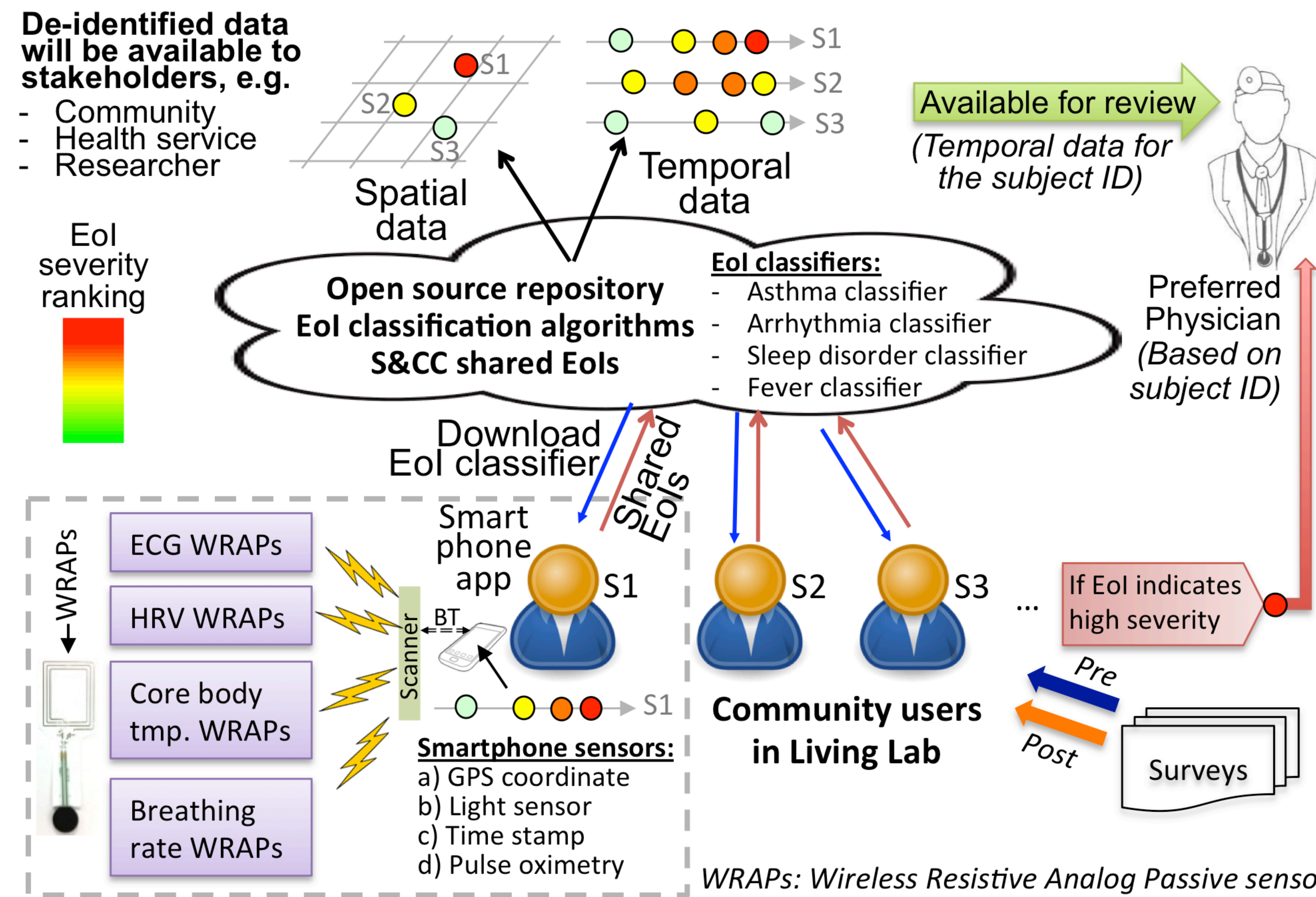
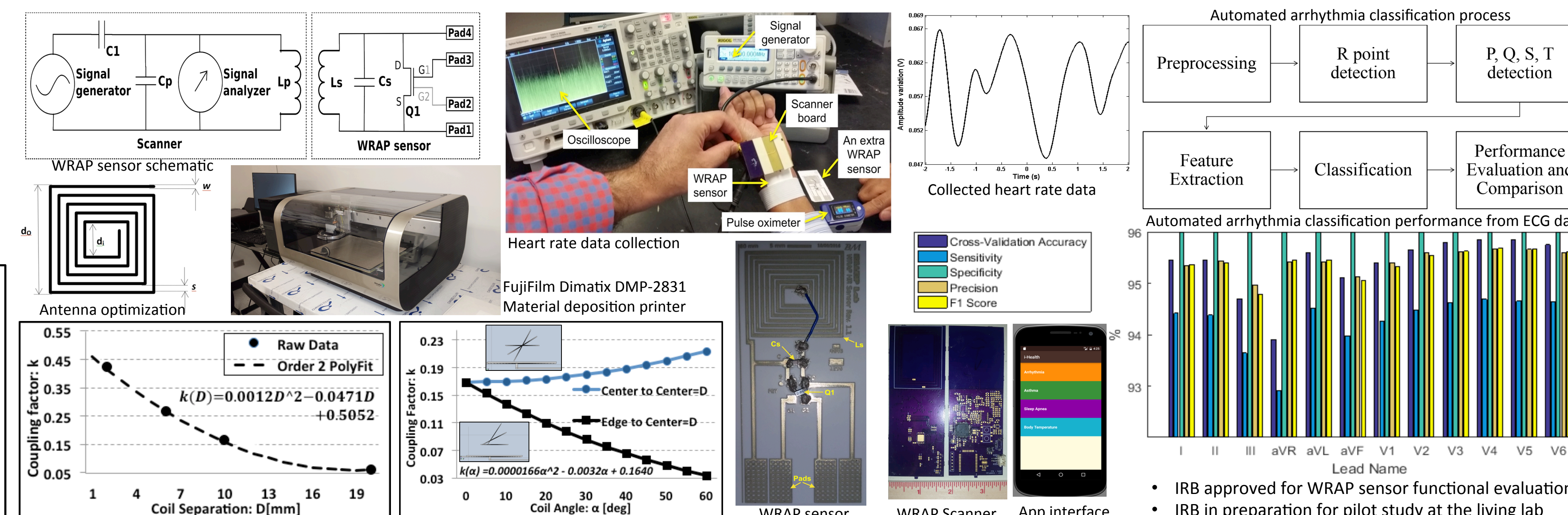


Fig. 1. Graphical representation of key aspects of the project.

Project Progress:



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Scientific Impact:

- Very low-cost, battery-less, easy-to-use disposable sensors enabling smart phone based collection of clinically relevant physiological signals.
- The WRAP sensors will be fully-passive, low-power (5 orders smaller than RFID), and fast (100 kbps vs 2 sps for RFID).
- Eol algorithms for in real-time accurate and sensitive classification.
- Research and clinical access to shared spatial and temporal Eol data.

Broader Impact:

- Better management of chronic disease via user friendly, personal health self-monitoring technology, and sharing anonymous Eols with S&CC.
- Enhanced patient self-monitoring of chronic health conditions with possible reduction in frequent and unnecessary hospital visits.
- Open-source enables additional Eol classifications; easy replicability and scaling of the framework for use in other S&CC.
- Spatial and temporal Eol data can be used for clinical/community decision support for high-priority just-in-time disease interventions.