Interactive Rehabilitation Device

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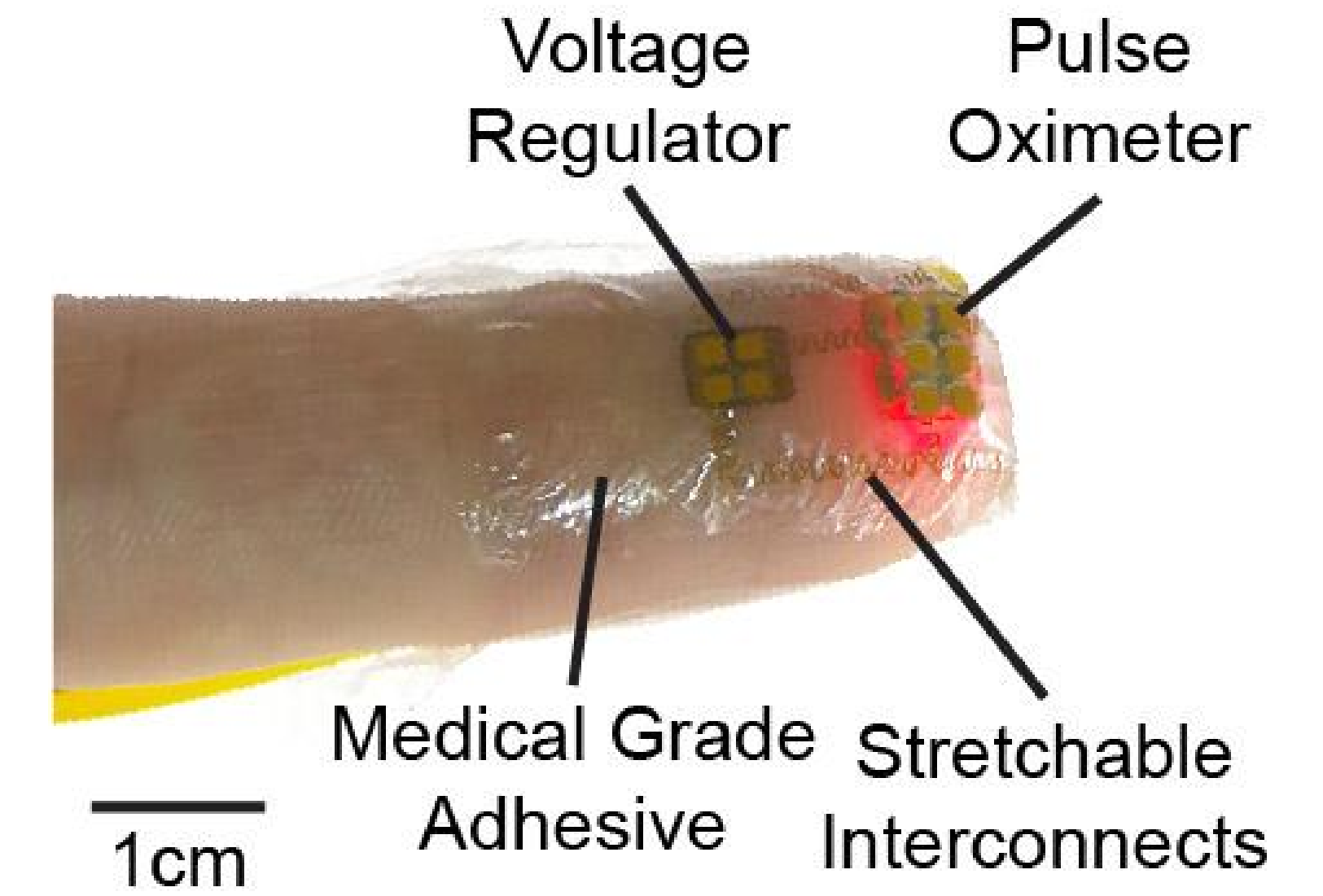
Motivation

Music Glove, Flint Rehab

It has been clinically proven that interactive rehabilitation devices improve clinical outcomes compared to conventional hand therapy. However, current home-based interactive hand therapy devices are prohibitively expensive or provide limited feedback to the patient and therapist.

Approach
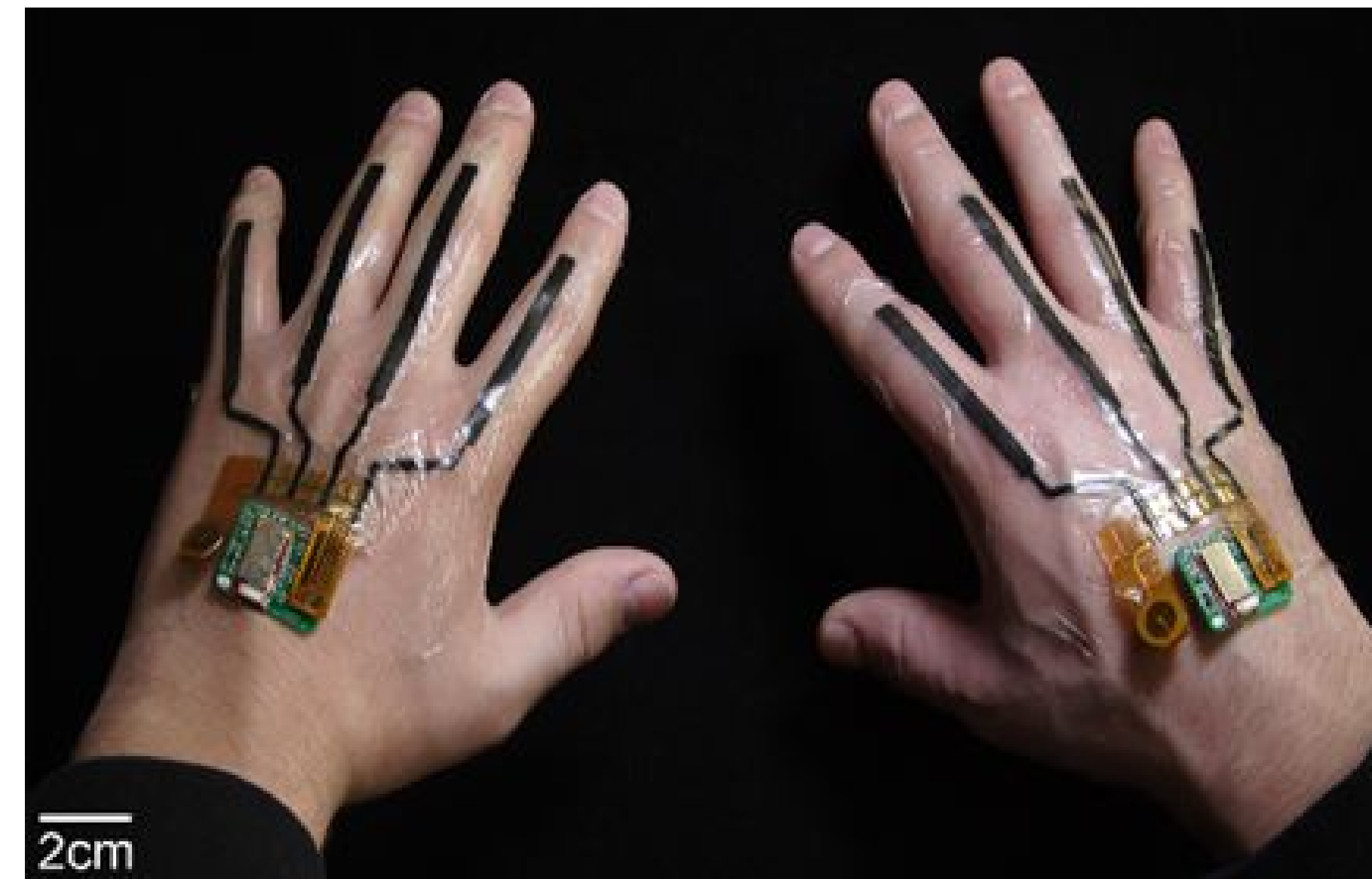
Our approach is to use inexpensive devices to monitor finger position and vital signs during therapy. We leverage low-latency cloud computing (cloudlets) to execute signal processing algorithms at real-time speeds. This framework will allow us to develop an in-home, interactive rehabilitation device while providing detailed feedback to the therapist.

Framework

Interactive Device — BLE link → Android Client — Raw data → Cloudlet Server — Results →
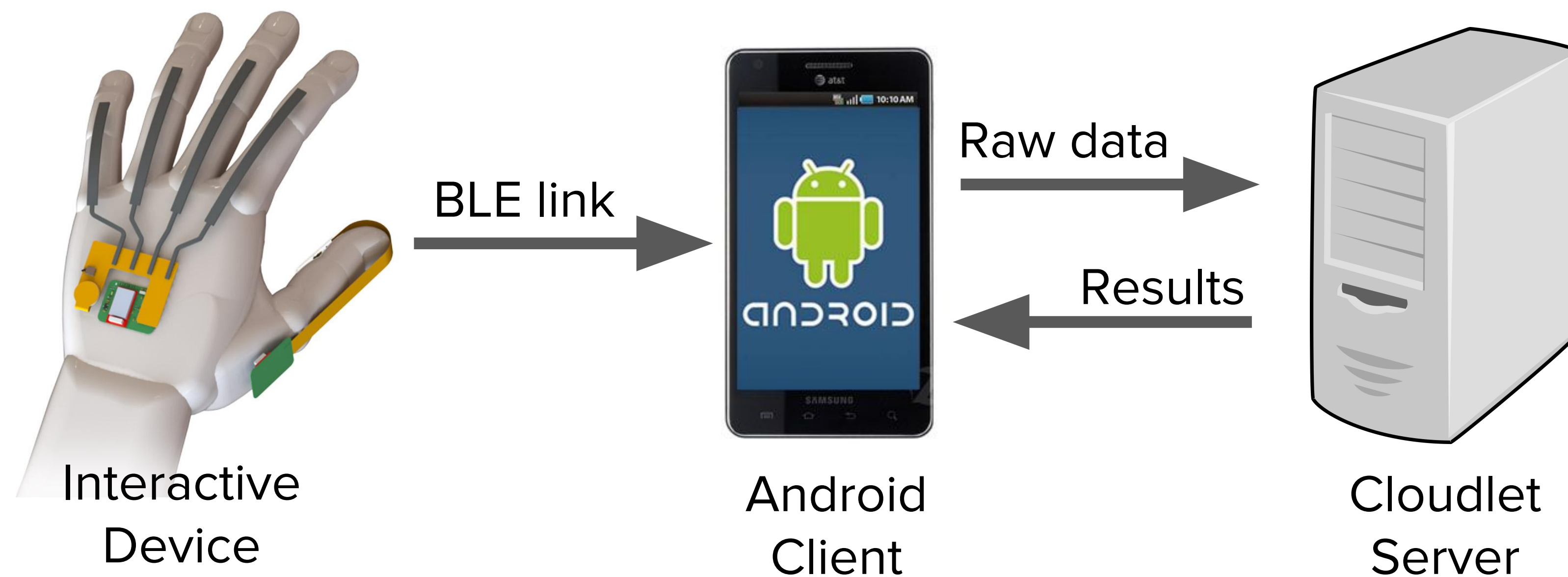
Standalone Client vs Server
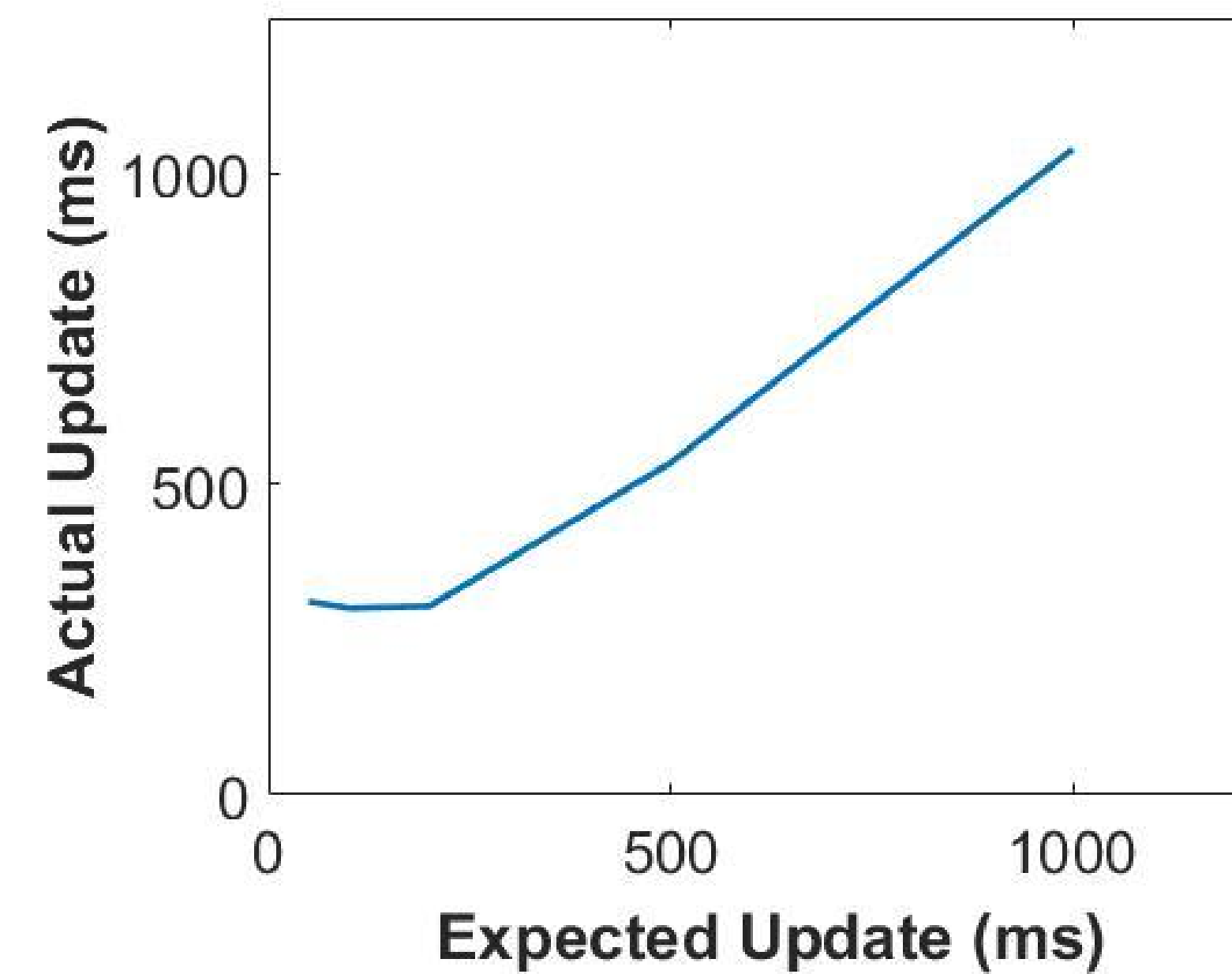
- Standalone version calculating heart rate only
  - 300ms update rate

- Server calculating heart rate and blood oxygenation
  - 50ms update rate