

DataWatch: Effectively Fostering Multimodal Smartwatch Interaction For Personal Health Data Exploration

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1. Background

- Smartwatches are attractive for their many sensors, increasing ability to collect complex health data, and their fast and accessible placement on the body while on-the-go
- However, due to a smartwatch's limited size and interaction capabilities, further exploring the collected data is often not an option






Current interfaces often allow for no exploratory interaction

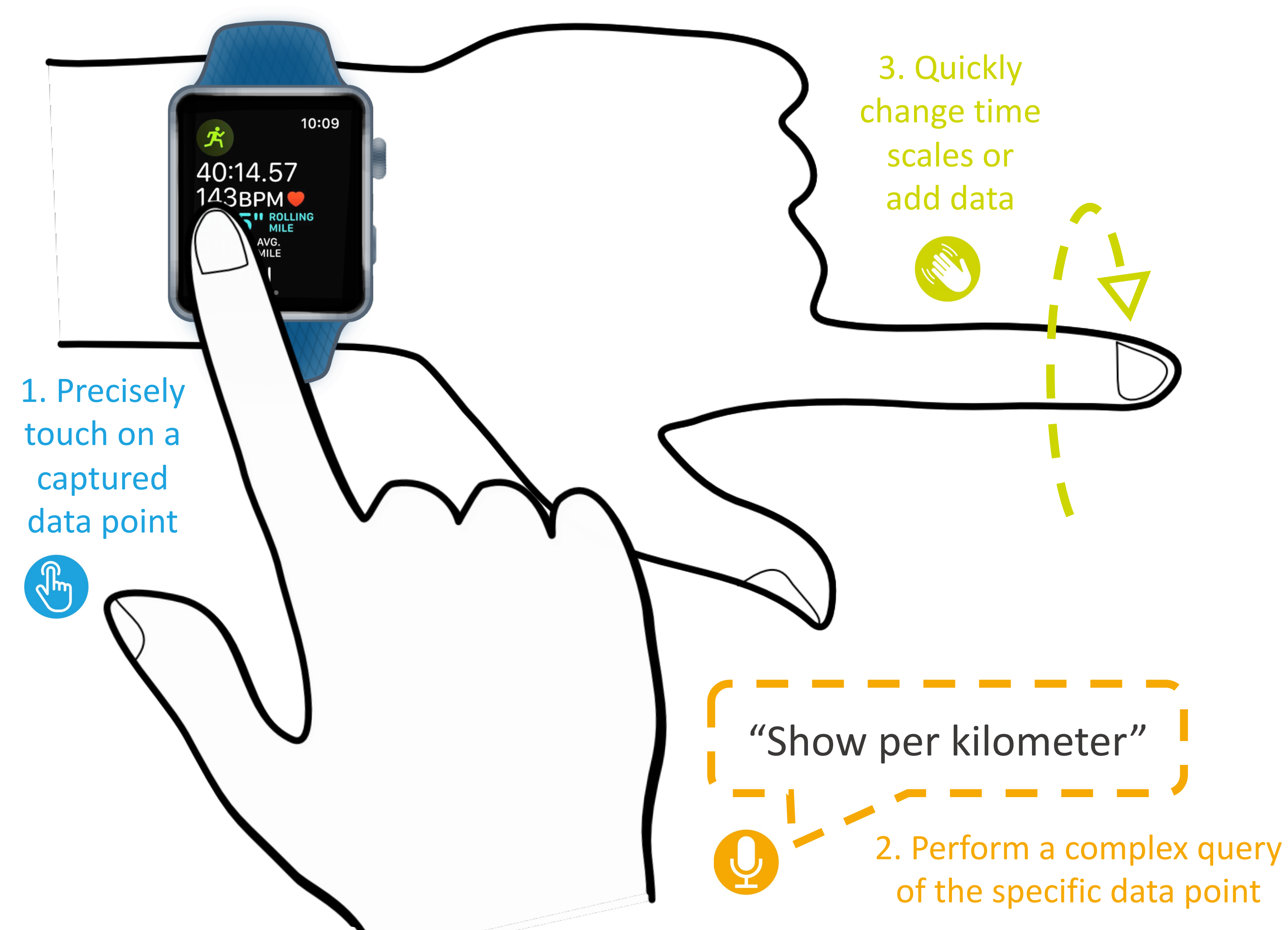
In-situ, access to complimentary health information can be beneficial

For example, what is your pace per mile while running? How about adding a quick comparison to yesterday's run?

2. Objectives

- Create a complementary multimodal interaction space through **touch** , **voice** , and **hand gestures** 
- Design a fully functioning smartwatch application utilizing personal health data
- Analyze the ability for these interactions to synergistically provide lightweight in-situ personal health data exploration

3. Methods



Touch

- Natural and precise interaction method designed to work for a single primary task

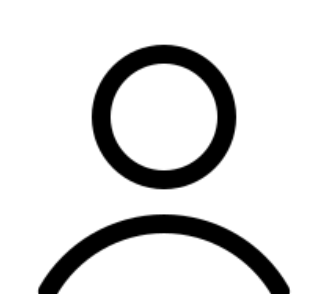
Voice

- Natural input modality allowing for complex queries to be asked
- Microsoft Cognitive Services used for the speech to text recognition
- Compromise and Chrono used for NLP

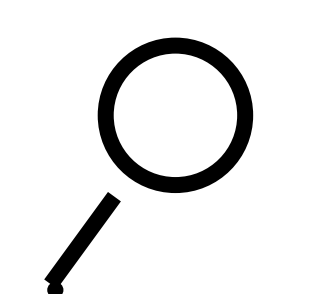
Hand Gestures

- Provides coarse input for non-primary tasks
- Utilize a Support Vector Machine classifier to classify 4 specific gestures

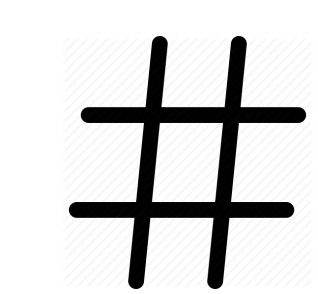
User Study



x 16 people who collect health data



Free-form exploratory study



Capture number and type of interactions



Qualitative interview and questionnaire

4. Significance

- Smartwatch health data and corresponding visualizations often utilize singular, or no, interaction methods; this is contradictory to many data exploration tasks
- Utilize multiple interaction methods, each of which has pros and cons, to foster increasingly effective in-situ health data exploration on smartwatches to the benefit of the end-user

Affiliations



University of Manitoba

Microsoft

