Active sensing and personalized interventions for pandemic-induced social isolation

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Problem Statement

- Use novel social modalities to predict social isolation and loneliness and identify effective personalized interventions in the elderly community
- Detect and diagnose social isolation
- Data driven design of interventions
- Deliver interventions and measure their effectiveness
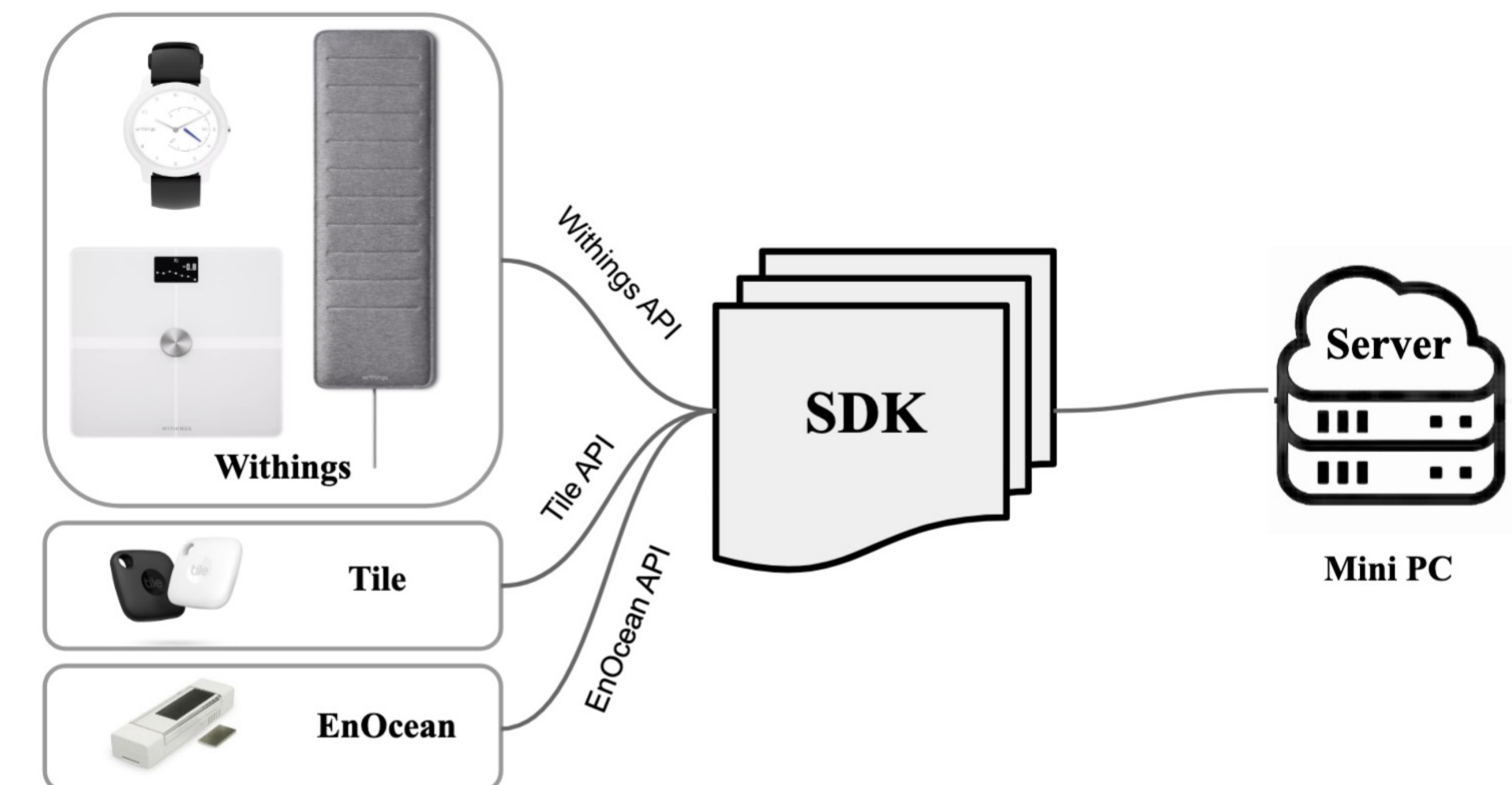
Intellectual Merit

- Within health sciences, the project will develop techniques to identify the onset of social isolation and develop personalized interventions to overcome it
- Within technology, the project will develop novel sensing modalities and predictive analytics and design a user-friendly platform to integrate these techniques

Platform prototyping

- Ease of use of the technology
  - Passive or minimal operation
- Accuracy of the ground truth
  - User-friendly input of subjective information, two loneliness scales
- Energy efficiency
  - Infrequent battery replacement or charging
- Data privacy
  - Converted inference and security strategies

Data Analysis

- Systematic categorization: mediators vs moderators
  - Dataset: National Social Life, Health, and Aging Project (NSHAP)
  - Loneliness Scale: UCLA Loneliness Scale
- Findings:
  - The weight and cardiovascular parameters are the most important variables related to predicting change in loneliness
  - Random Forest has the best regression performance for loneliness across three rounds of data collection

Broader Impact (community partners)

- Ralston House in Philadelphia: smaller community of low-income older adults
- Shikano-dai area of Ikoma City: larger mixed community with large number of older adults

Broader Impact (sustainability)

- Facilitate re-engagement of older adults with the community
- Develop a technology platform and a set of tools for gerontology study
- Diversity of participants will lead to universal applicability of findings
- Application to other age groups for the development of innovative technologies in mental healthcare

Next Steps

- Planned activities
  - User interface design
  - Workshops
  - Student exchange
  - Deployment of platform
  - Data collection
- Expected outcome
  - Predict loneliness scale (UCLA & Lubben) using measurements from our platform