Designing and testing remote services to support formerly homeless persons in permanent housing

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Permanent supportive housing (PSH) is long-term, community-based housing combined with supportive services

PSH is an evidence-based and cost-effective intervention to end Homelessness.

Demand for tele-services is likely to increase.

- What are the socio-technological factors that affect the successful use of tele-services in PSH?

- What are some technologies that should be developed to provide new types of tele-services?

Intellectual Merit

- Identify the factors that affect the efficacy of technology-mediated services
  - Limited research on the use of technology in PSH. How might technology benefit PSH tenants?

- Identify PSH resident needs that could be addressed with technology
  - Needs assessment to identify services that could be provided with technology integrated into the PSH unit

- Develop and evaluate new supportive technologies in PSH setting
  - Current assistive technologies do not directly meet the constraints and opportunities in the PSH setting
  - Adapt "smart home" technologies to develop selected services
  - Develop technologies that reflect PSH residents privacy and communication preferences

- Evaluate proposed solutions by residents of community partners' PSH sites

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Focus groups with PSH residents

To understand how the application of technology might benefit PSH tenants
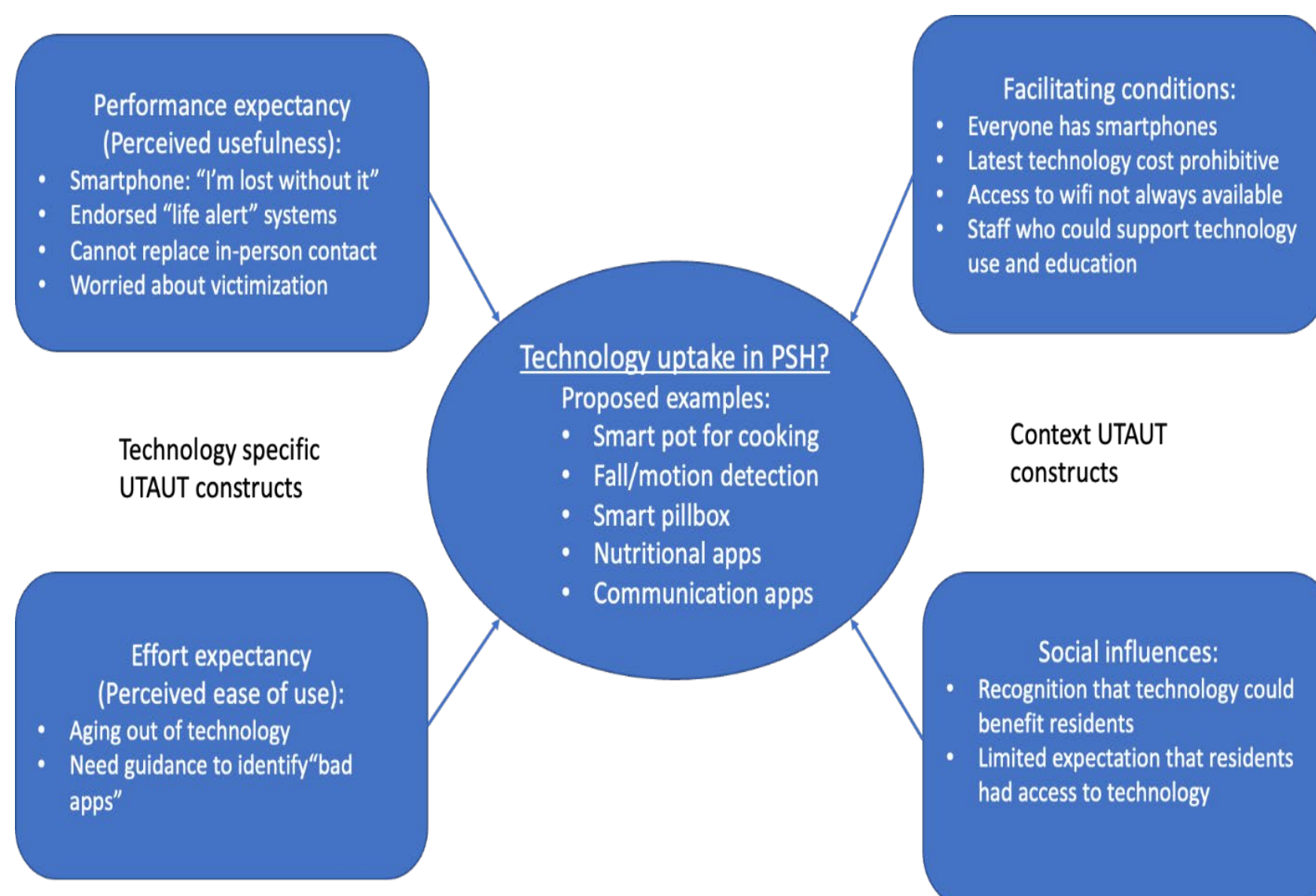
Smart Cooking Assistant

- Assist residents with limited cooking experience
- System observes user follow a recipe and provides reminders on when to move to the next step
- Recipes recommended by Public Health experts
- Camera, IR camera, and temperature sensor
- Image processing to identify the stage of cooking

IoT-based Pill Dispenser and Smart Cup

- System consists of a motorized Pill Dispenser, Smart Cup, and a tablet computer interface

- Focus on verifying pill consumption after a pill is dispensed and who to notify if the user does not take the dispensed medication

- Smart Cup uses accelerometers, gyroscopes, and ultrasonic sensors to verify pill consumption
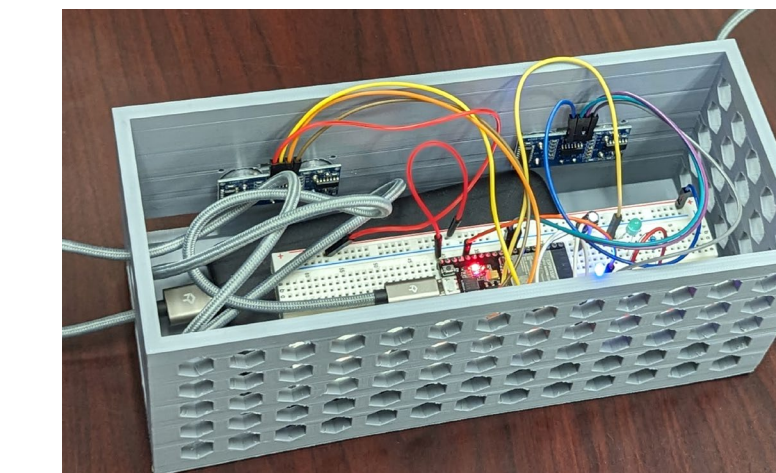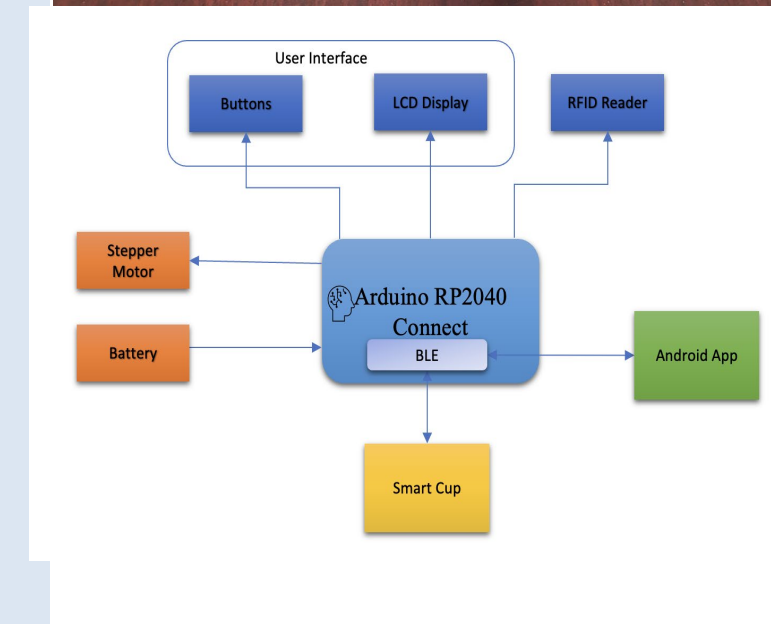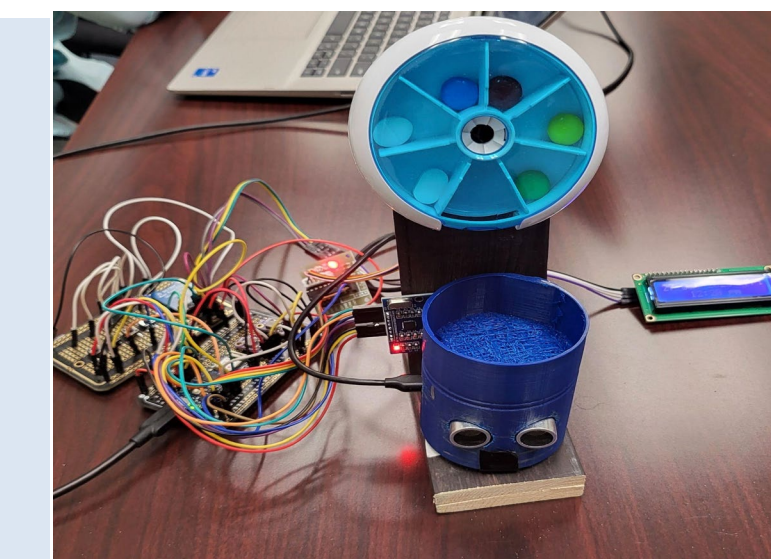
Smart "Wellness check"

- System to generate a wellness check if a resident is immobile or missing

- Designed to be non-invasive, integrated into the PSH unit: not a wearable, does not use cameras

- Multiple sensors: passive infrared motion, ultrasonic sensor, a light sensor, and an accelerometer

- Each sensor detects a different aspect of presence within the apartment: changes in sound, light intensity, vibration

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Immediate Impact

Research outcomes can inform the design of future PSH units being built by community partners

Broader impact

Effective use of tele-services can reduce the cost of providing supportive services in PSH

Next steps

- Survey of technology use to all residents at PSH sites of community partners
- Complete design and implantation of the three smart technologies
- Evaluation of the three technologies with community partners

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