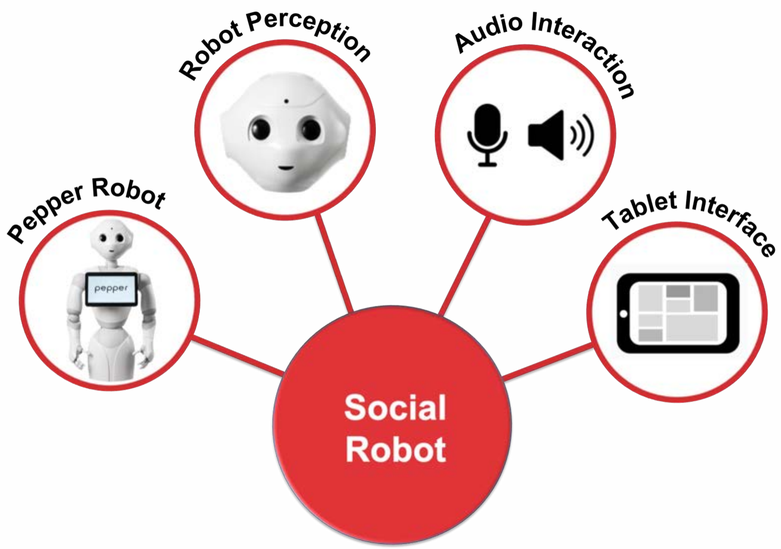
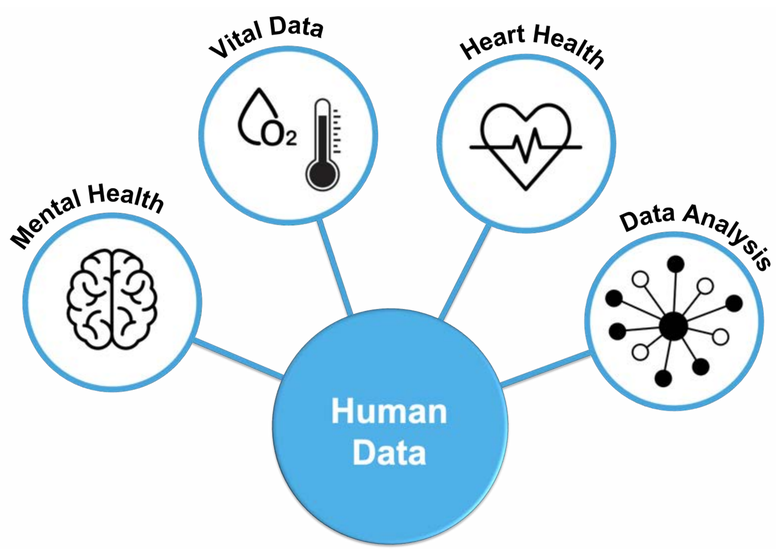
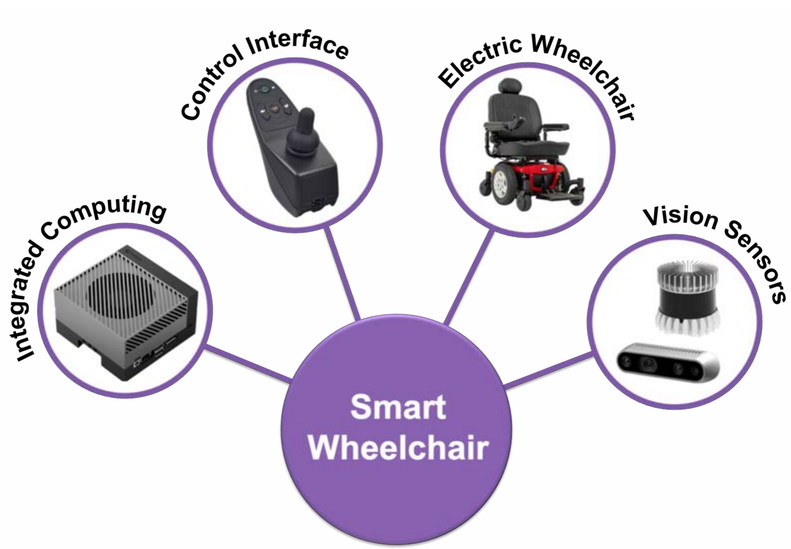
AUTONOMY RESEARCH CENTER FOR STEAHM

Social and Moral Autonomy

WATCHER
Wheelchair Assist Technology and Co-bot HElper Robot







Synopsis

- Development of semi-autonomous wheelchair and socially aware robot health aid to encourage community participation for persons with low mobility
- Integrating autonomous navigation capabilities into an electric powered wheelchair can enhance mobility for daily living activities
- A social robot that encourages engagement with other persons in the community can have a positive effect on physical and mental health
- Analyzing vital and social data can be used to better evaluate human health

Research Objective

- Develop a Smart Wheelchair mobility platform using a electric powered wheelchair and autonomous navigation capabilities from robotics
- Design and program social interaction features using semi-humanoid robot Pepper
- Human body data collection and analysis using platform integrated sensors and wearable devices

Research Approach

- Integrate navigation sensors and software autonomy into a commercially available electric powered wheelchair
- Develop Pepper robot voice interaction and tablet user interface for social engagement
- Track body vital data to improve interaction between wheelchair user and assistive technology

Research Results and Products

- Smart wheelchair adapted with a hybrid control interface, vision sensors, and autonomous navigation capabilities for enhanced mobility
- Human data collection with wearables, smart wheelchair integrated sensors, and social robot sensing
- Integration of conversational AI with semi-humanoid robot and user interface development for audio/visual human-robot social interaction

Commercialization and/or Societal Impact Opportunities

- **Application:** Intelligent medical mobility and health monitoring
- **Key Values**: Enhanced power wheelchair safety and reduced cognitive load
- **Potential Customers:** Wheelchair users, care facilities, transportation

Team Names & Collaborators

ARCS Students & Student Collaborators:

Megan Ngo, MBA; Danielle Sanchez, SOC; Shari Salas, ME; Chinedu Egbujor, CS; Avni Israni, CS; Dami Adenugba; CS, Radian Avetisyan CS; Brendan Ascorra, CS; Daniel Betancourt, CS; Grigor Azakian, CS

ARCS Faculty & Staff:

Prof. Amiel Hartman, ME
Dr. Xunfei Jiang, CS
Dr. Kacie Blackman, HSCI
Dr. Nhut Ho, ME

CSUN

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Updated 09/2024