

Robots as a Tool to Support Everyday Health

Casey Bennett, PhD

*The opinions expressed herein are those of the author,
and do not necessarily reflect the views of CVS Health,
Indiana University, or their affiliates.*



A word cloud centered around the theme of health and behavior. The words are arranged in a circular pattern, with the largest words being "Behavior", "Health", "Exercise", "Treatment", and "Diet". Other words include "Adherence", "Lifestyle", "Activity", "Wellness", "Change", "Environmental", "Interventions", "Medication", "Psychological", "Nutrition", "Monitor", "Complex", "Isolation", "Intake", "Fitness", "Habit", "Public", "Disability", "Sleep", "Snacking", "Control", "Food", "Social", "Improve", "Prevention", "Physical", and "Mental". The words are in various colors, including blue, orange, and white, and are of different sizes, indicating their relative importance or frequency in the context.

Behavior

Health

Exercise

Treatment

Diet

Adherence

Lifestyle

Activity

Wellness

Change

Environmental

Interventions

Medication

Psychological

Nutrition

Monitor

Complex

Isolation

Intake

Fitness

Habit

Public

Disability

Sleep

Snacking

Control

Food

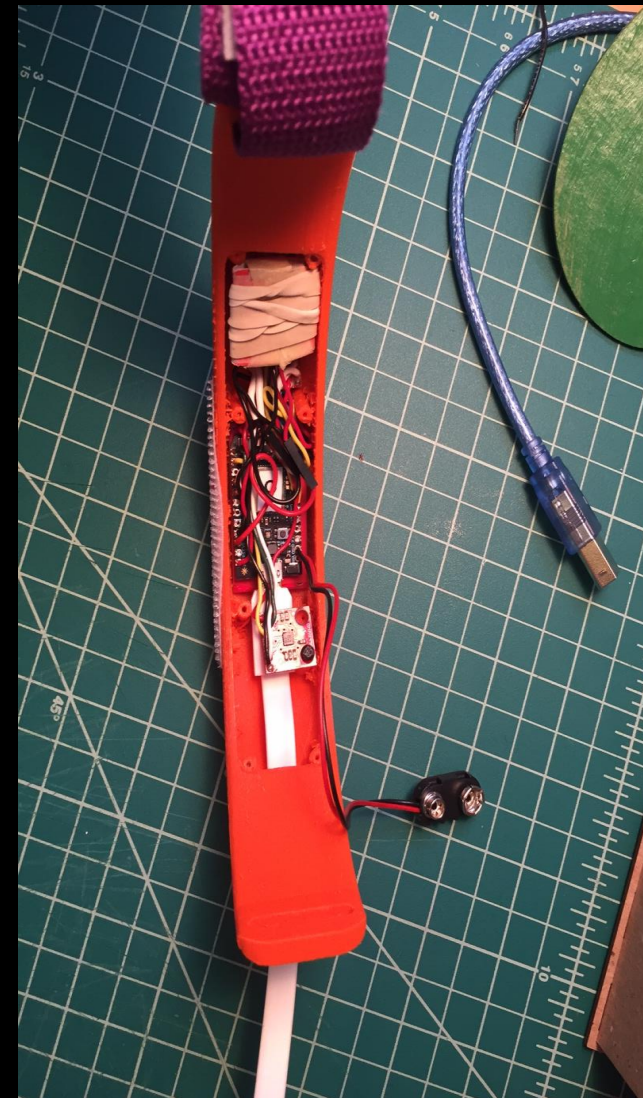
Social

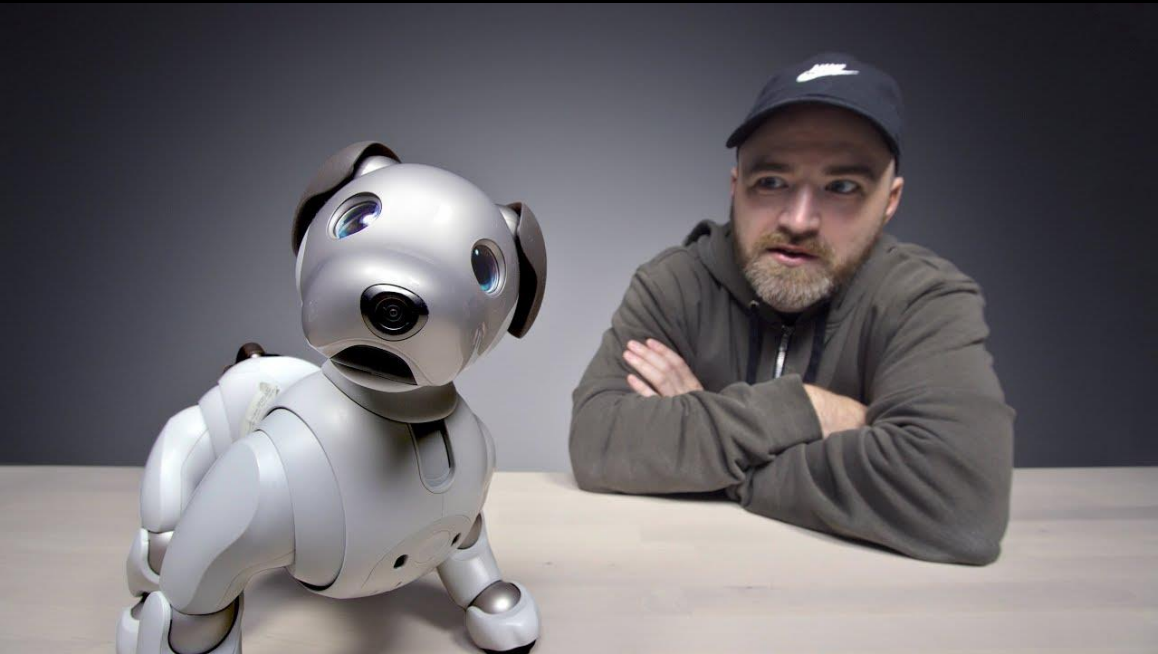
Improve

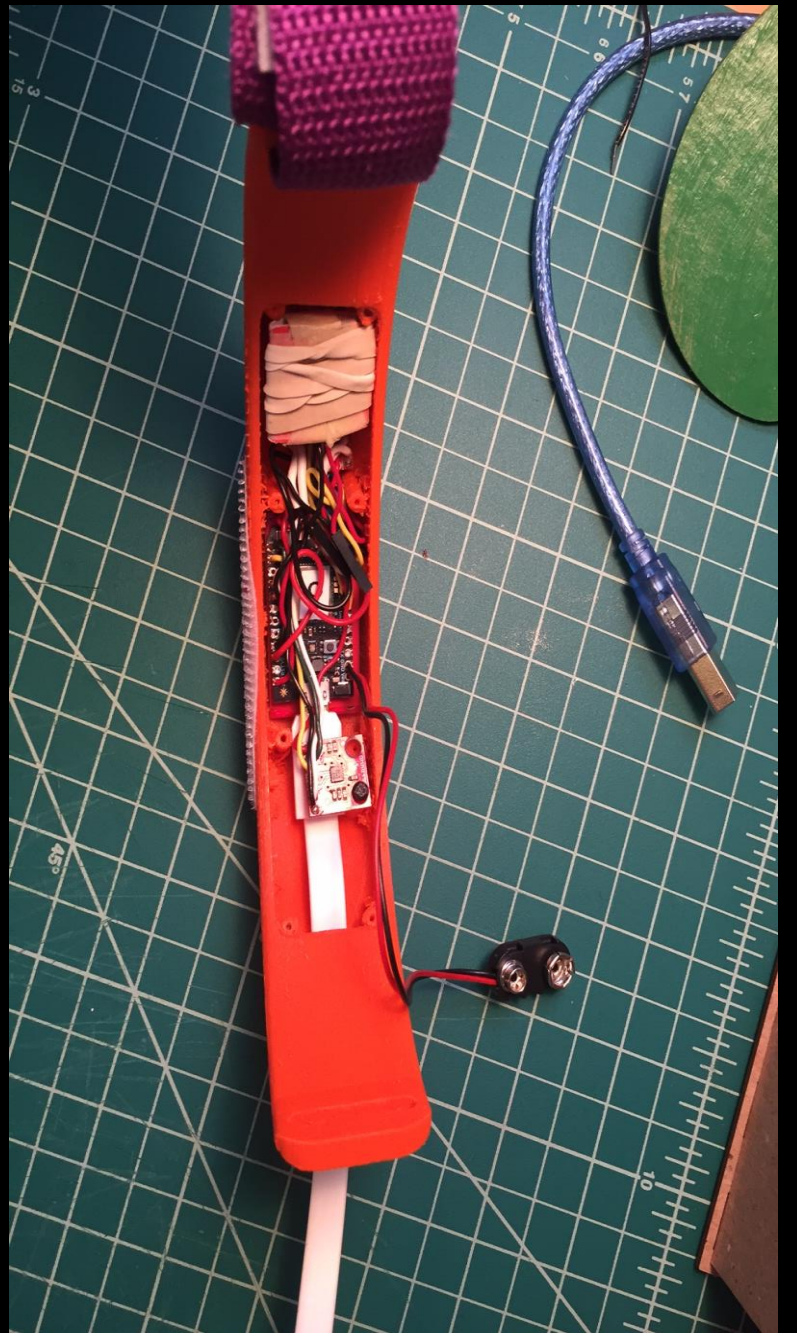
Prevention

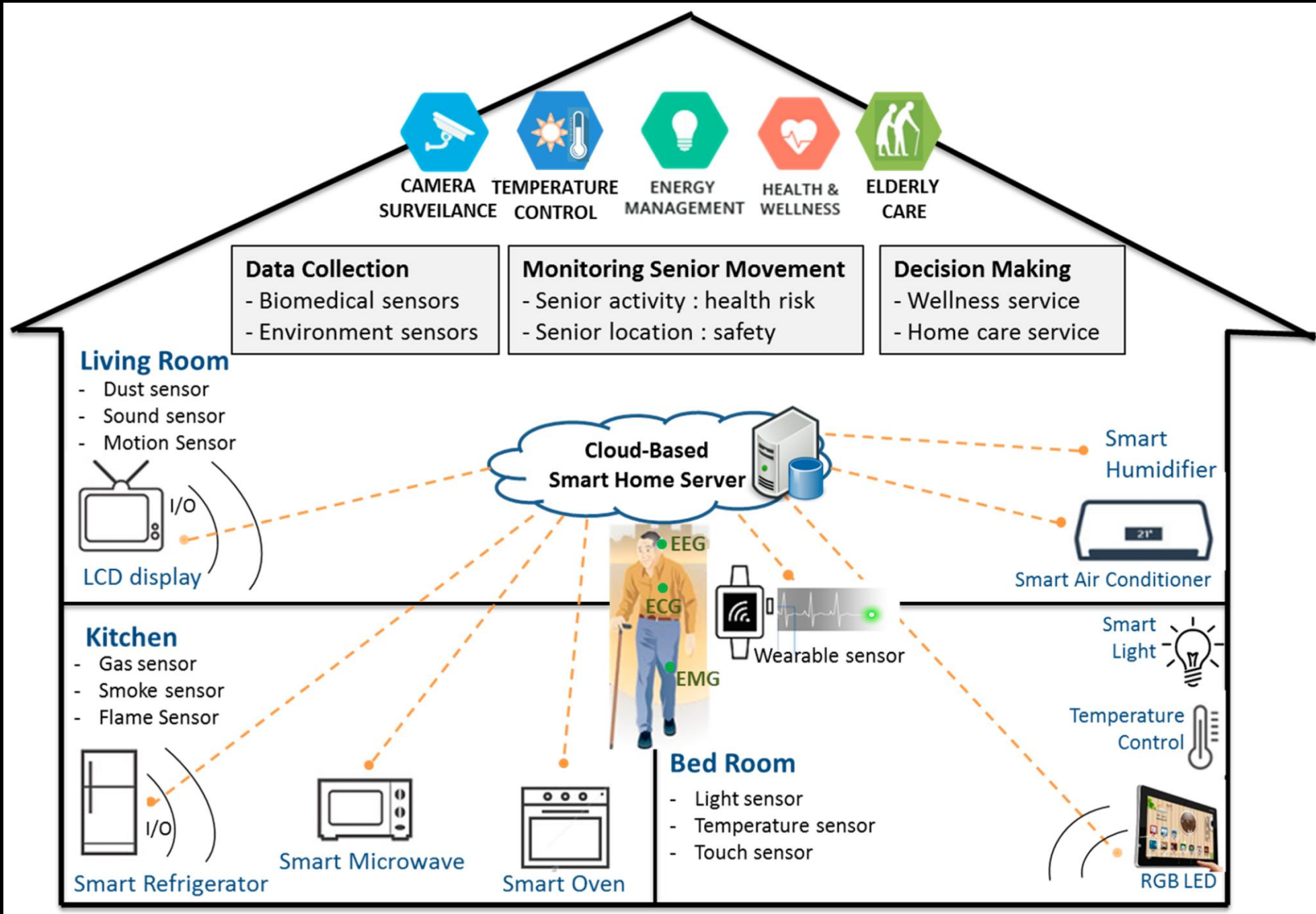
Physical

Mental



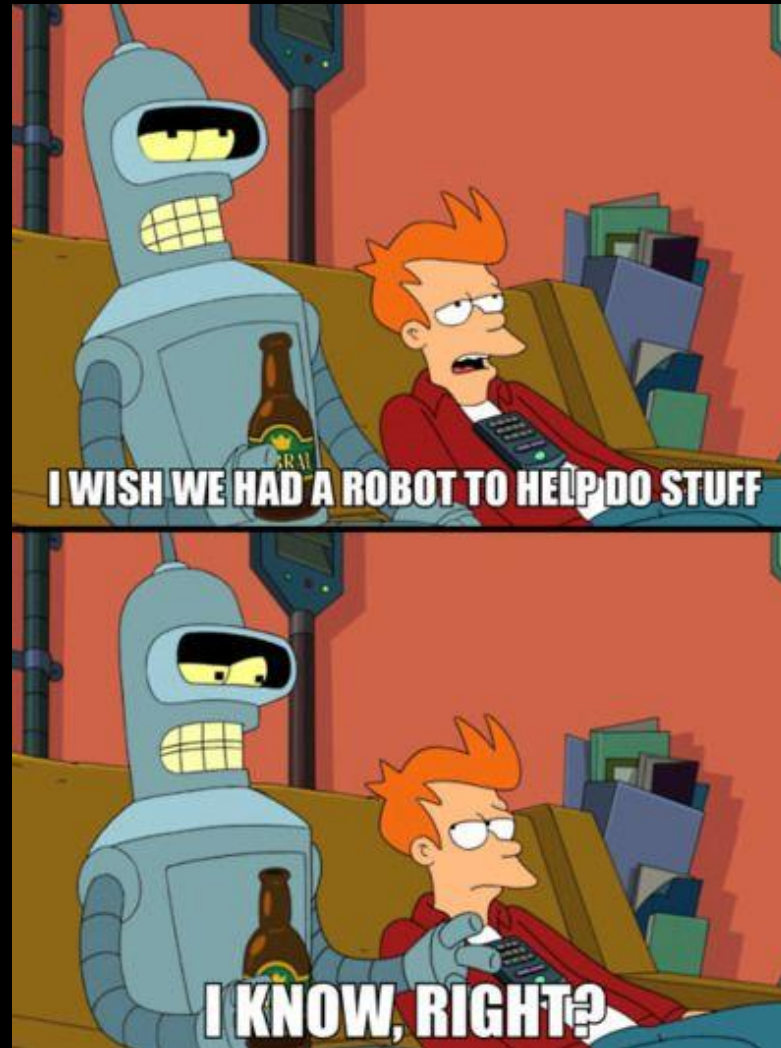






- **Dust/Allergens**
- **Indoor CO₂ Levels**
- **Temperature**
- **Heavy Metal Exposure (Aluminum, Lead, Mercury)**

Preventing the *Progression*



Treatment is a sequence of decisions

**The problem is not the 70% of the time we
get it right ... it is the 30% we don't**



An exercise in *behavioral re-engineering*



Combining lots of different pieces – Artificial Intelligence, MDPs, Machine Learning, Clinical Decision Support Systems, Robotics, Remote Sensing – into *layers*, in the same way a car engine has different components

- Artificial Intelligence
- MDPs
- Machine Learning
- Clinical Decision Support
- Robotics
- Remote Sensing



- Spark Ignition
- Carburetor
- Fuel Injectors
- Piston/Engine Block
- Radiator
- Alternator

Questions? Contact Me:

- www.CaseyBennett.com
- cabennet@indiana.edu
- Casey.Bennett@CVShealth.com

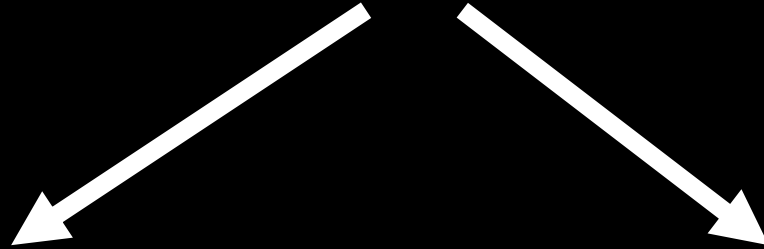


APPENDIX

Depression



Stratifying Interventions



Clinical

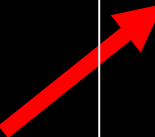
Case Mgmt

Some Case Mgmt intervention examples ...

Service Types
Care coordination among healthcare providers
Community resource referrals
Disease support services
Post-hospital care
Wellness services

Depression Interventions
Administer PHQ9
Assess Symptoms
Assess Med Adherence
Social Needs Assessment
Identify Treatment Barriers
Review Treatment Goals
Arrange PCP visit
Request Physician Med Review
Request Physician Tx Plan Change
Arrange Mental Health visit
Arrange EAP

Patient 1

- 50-year old patient, primary depression diagnosis, Physician Referral
 - “Arranging Mental Health Visit” makes no difference in chance of improvement, <10% either way
 - Main risk factors included: lower overall historical costs, referral reason, and higher GAD score
- 

Patient 2

- 21-year old cancer patient with depression, referred via ER Admission
 - “Arranging Mental Health Visit” would double chance of improvement, 33.1% vs. 64.5%
 - Main risk factors included: higher historical drug costs and young age
- 