Introduction

- Energy use and how to reduce consumption is very relevant in the modern world, especially with the rise of climate change.
- The residential energy use sector produces around 20% of the United State’s total greenhouse gas emissions [1].
- Rise of new smart home technologies + automated intelligence in order to give direct feedback on energy use → easier for residents to change their behavior and consume less energy.

Methods & Research

Environmental Framing:
- Environmental framing focus = motivate the user to lower their energy consumption by showing them environmental impacts (i.e. kWh → miles driven or kWh → CO2 emitted).
- In the survey that my mentor carried out, around 75% of the respondents said that they at least somewhat agreed that they feel responsible for reducing energy use to protect the environment.
- Another study found that environmental concern has a significant direct positive impact on the purchase intentions of eco-friendly smart home objects [2].

https://tinyurl.com/SHINEinterface

Interface design:
- Disaggregated and area-based graphs as opposed to aggregated and/or time-based linear graphs [3].
- Nature-inspired artistic visuals are effective in showing environmental impact to users, as well as having an emotional effect [5].
- Indicators present in a user’s daily life, like the colors corresponding to a traffic light [4].
- The use of icons help bridge the gap between the model and the user’s mind [4].

Survey

- Goal: test out the effectiveness of my interface on the overall usability, satisfaction, and understanding of the interface for the user:
  - “The disaggregated (separated by appliance) data is helpful in understanding general energy consumption” - rate on a 1-5 scale.
- Results:
  - Interface was motivating to reduce energy consumption (3-5) as well as meeting energy saving expectations (3 and 5).
  - Some people thought interface was a bit confusing or difficult to navigate.

Objective & Impact of Professor’s Research

- Dr. Bercerik-Gerber’s research is focused on how human-building interaction can be adaptive and responsive to the needs of humans.
- Zero Emission Affordable Housing Design focuses on designing a smart home interface for affordable housing that can manage one’s energy usage.
- The building and the user is able to work together with technology to reduce energy consumption.

Citations