STOVESAFe
ALERT AND RESPOND

If you can't stand the heat, put stove safe in your kitchen
PROBLEM: STOVE SAFETY

Introduction

- 108,900 cooking related fires in 2006*
  - 58 fatalities, 2,236 injuries, $104.85M
- Leading cause: Unattended Cooking
- 54% smoke alarm failures due to missing/disconnected battery**

* US Fire Administration, **NFPA Fire Analysis and Research
http://smbycleanway.com/
STOVESAFe SOLUTIONS
Design and Requirements

- **Motion Detection**
  - Shuts off stove after preset time
  - Cheap
  - Compact
  - No temperature interference
  - Control Stove

- **Smoke Detection**
  - Turn stove off
  - Snooze button
DETECTOR

RESET BUTTON

WIRELESS

SMOKE DETECTOR

SWITCH

TIMER

MOTION DETECTOR

STOVE PLUGS IN

STOVE
DETECTOR

- Smoke Detector
- Wireless
- Reset Button
- Switch
- Timer
- Motion Detector
- Stove Plugs In
DETECTOR

- Smoke Detector
- Wireless
- Switch
- Reset Button
- On/Off Switch
- Timer
- Motion Detector
- Stove Plugs In
DETECTOR

SMOKE DETECTOR

WIRELESS

RESET BUTTON

RESET

STOVE PLUGS IN
TARGETING ELDERLY
Customer and Market Analysis

 Adults purchase for elderly parents
 Made for older adults
  • Cooking fires leading cause of fire injuries
  • 3rd leading cause of fire deaths
 90 million homeowners

 Survey College Students, n=40
 Thought useful for:
  • Older Adults
  • Working Parents

*Montgomery County Fire and Rescue Service
http://www.hfpd.org/cooking_safety.htm
DETECTOR TELL US ABOUT STOVE USE?

Fundamental Question

- UltraSonic Range Finder
MOTION SENSOR ANALYSIS

Fundamental Question

Detection of Activity by Wall-Mounted Motion Sensor

- Emptying Dishwasher
- Left Kitchen
- Prepping Food
- Standing at Stove
- Cleanup

High Activity

No Activity

0 min 5 min 10 min 15 min
MOTION SENSOR IN PRICE RANGE?

Fundamental Question

- Devantech Ultrasonic Range Finder
  - Price: $24
  - Range: 15cm – 6m
  - Size: 24mm x 20mm x 17mm
USABILITY
Lessons Learned

- Placement
- Sensing Zone

- Adjustability
  - Timer
  - Controls
STOVESAFe RECAP

Key Takeaways

- Motion sensor and smoke detector technically feasible
- Products available for benchmarking
- Target population excited
- Challenges:
  - Adjustability Logistics
  - Integration
    - Combine
    - Stove vs. Oven
QUESTIONS?
MORE DETAILED SURVEY RESULTS

Back-Up Slides

- N=40
- Users: 36/40 → Age 18-24
- 50% users leave stove unattended 2-10min
- 85% use smoke detector switch
  - 10% interest 8-10
  - 67% pay <$20
BENCHMARK PRODUCT: STOVE GUARD

Features:
- Motion sensor with shutoff timer

Drawbacks:
- Expensive - $359.95 + S/H
SWITCH DIAGRAM
Design Features

Stove: on
Smoke Detector: disarmed

Stove turned on
After 10 min
Reset button pressed

Stove: on
Smoke Detector: ready

Smoke:
Stove: off
Smoke Detector: beeping