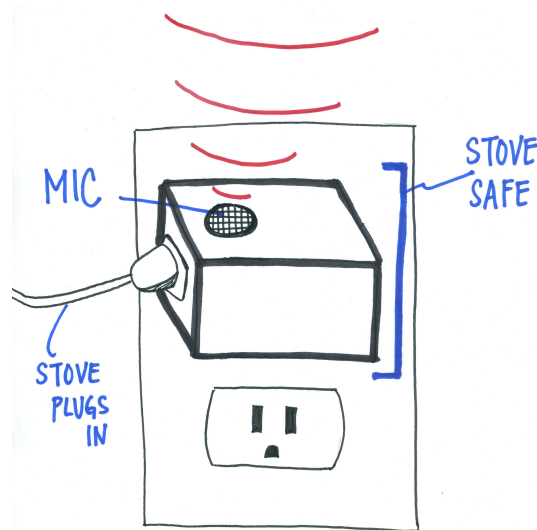
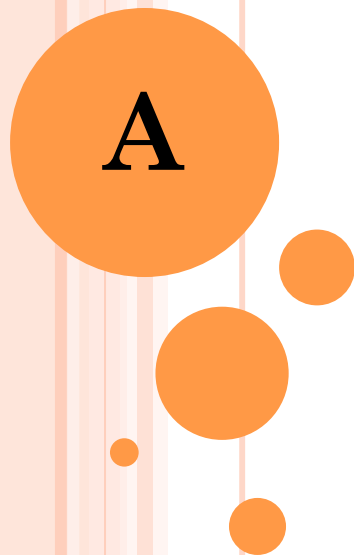


STOVESAFE

ALERT AND RESPOND



Cutting off power to your stove when it hears the frequency of your smoke alarm

SMOKE ALARM SENSING SHUTOFF DEVICE

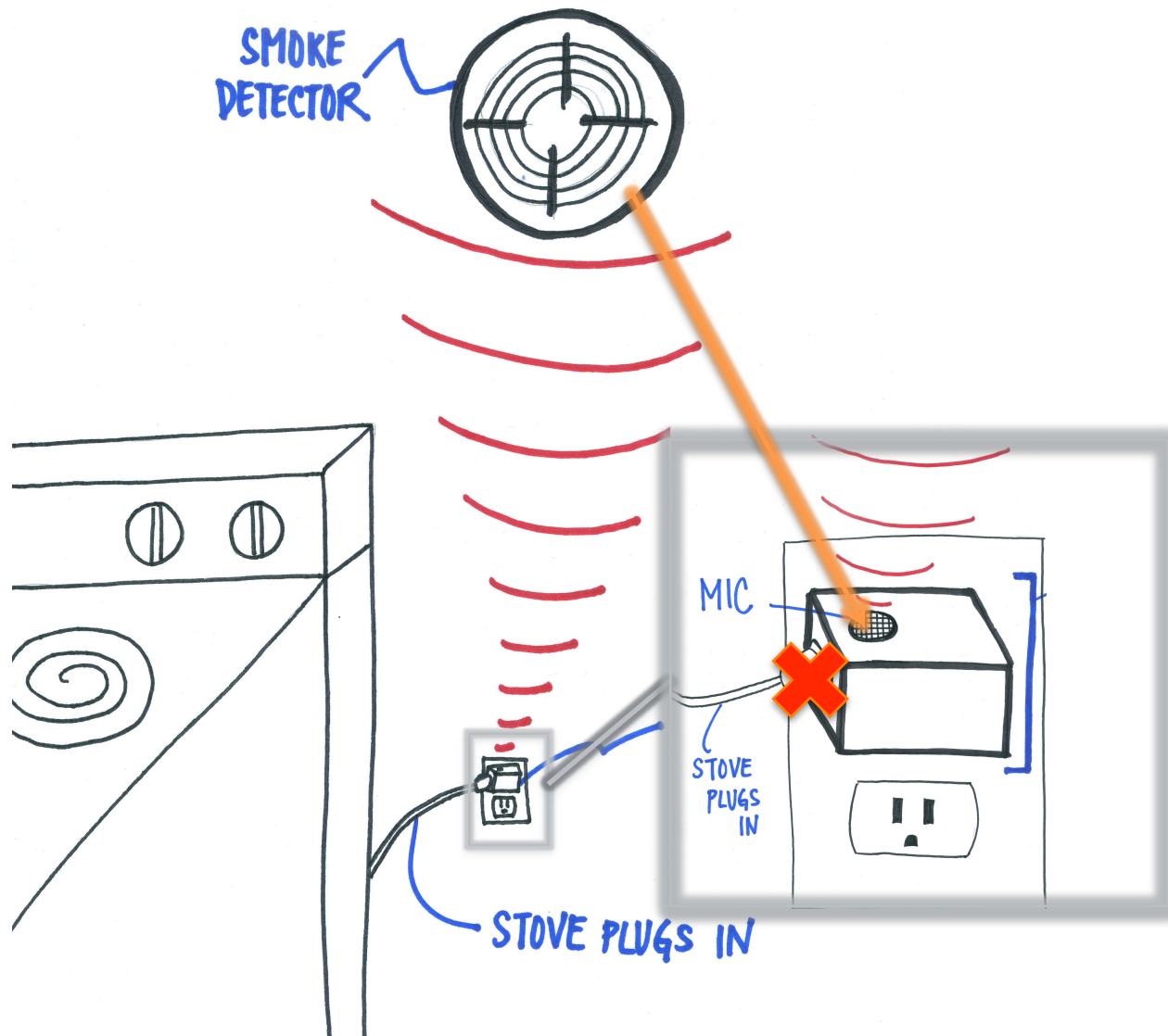
Key Problem

- 108,900 cooking related fires in 2006
 - Smoke detectors only alert, no response
 - 4 Stage of Fire:
 - Incipient stage -- Little heat, develops slowly.
 - Smouldering stage – Smoke
 - Flame stage -- Visible flame
 - Heat stage -- Heat, flame, smoke and toxic gases
- ← STOVESAFE



SMOKE ALARM SENSING SHUTOFF DEVICE

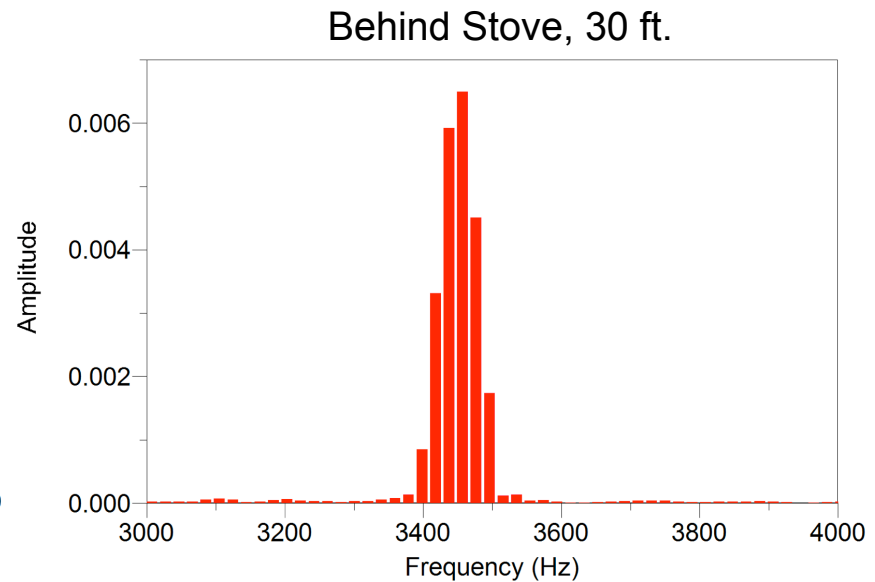
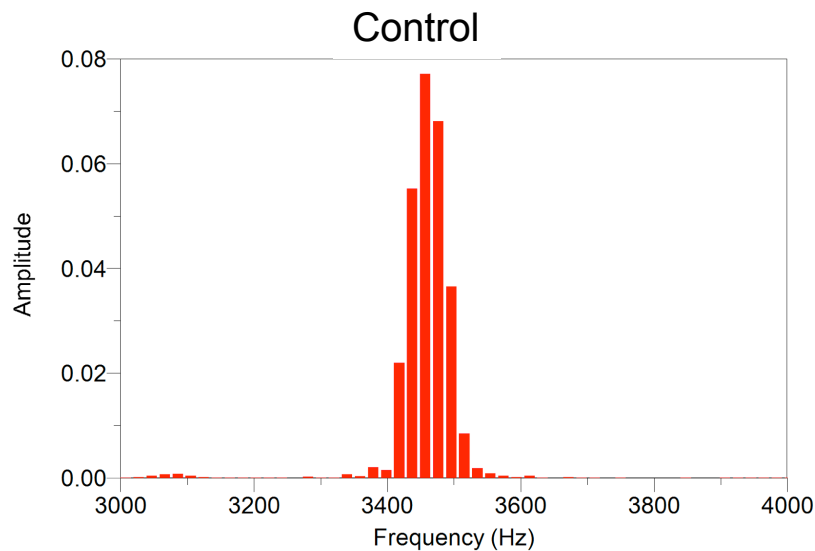
Key Concept



SMOKE DETECTOR VARIABILITY

Key Challenges

- Smoke alarm frequency is consistently 3.5kHz-4.5kHz

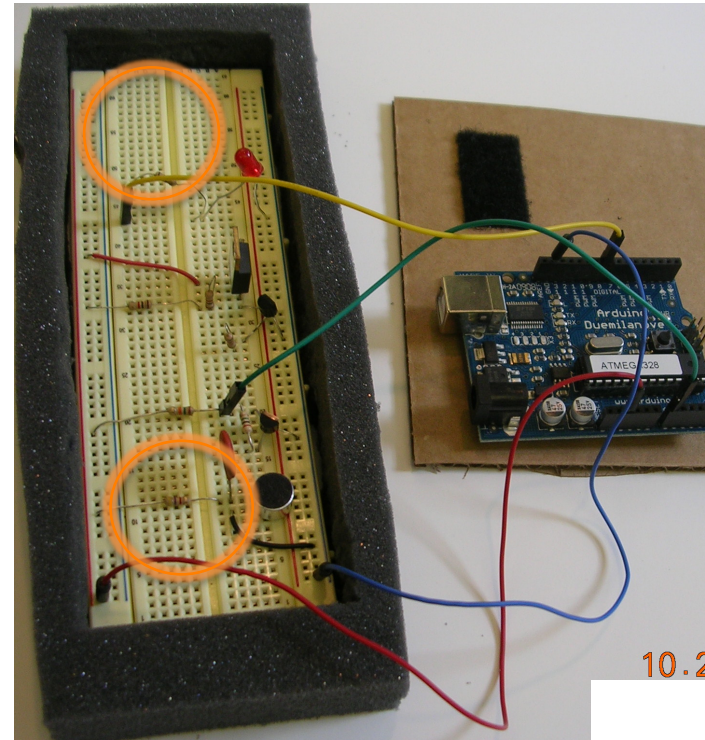


Distance does not effect frequency

TECHNICAL FEASIBILITY

Key Challenges

- Loud noise shuts off LED
 - Microphone
 - Micro-Controller
 - Arduino Circuit Board
- **Audio signal can cut power**
- Food smokes before burning,
- **Stove shutoff effective**



Special thanks to: Elaine Yang, Dr. Barbara Hughey, Shane Colton, Michael Price, Prof. Joel Voldman, and Prof. David Wallace

MARKET RESEARCH

Key Challenges

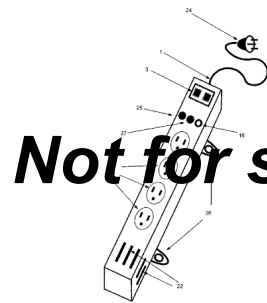
- Every house is required to have a smoke detector
- 64% stoves shipped in US in 2008 were electric (5 million units)
- Competition:



Smoke Alarm
Activation Indicator

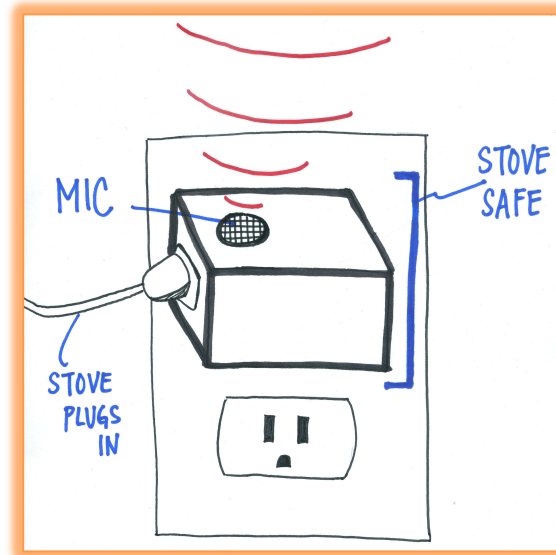


StoveGuard



Not for stoves

Power Strip



STOVESAFE!

PRODUCT CONTRACT

Product, Customer, and Market

- Product Description: Smoke Alarm Sensing Shutoff Device
- Intended Customer: Residential Electric Stove Users
- Market: Kitchen Safety/Fire Safety

Customer Needs	Product Attributes	Engineering Specifications
Easy to install by user	Time	< 1 hour
Compact enough to fit behind stove	Thickness	< 2.5"
Easy to learn how to use	Time	< 5 min
Fast response to smoke alarm	Time	< 5 sec
Few false positives (Accidental stove shut off)	%	< 5%
Few failures (Does not respond to smoke alarm)	%	< 1%
Cost	\$	< \$100



STOVESAFE IS FEASIBLE, BUT...

Future Steps

- Future Challenges
 - Sensitivity
 - Reset
- Future Steps
 - Respond to frequency
 - Calibration
 - Components that handle higher currents

