

Fescue Rescue

Anti-Digging Harness College of Engineering

ECE 590 Senior Design Experience

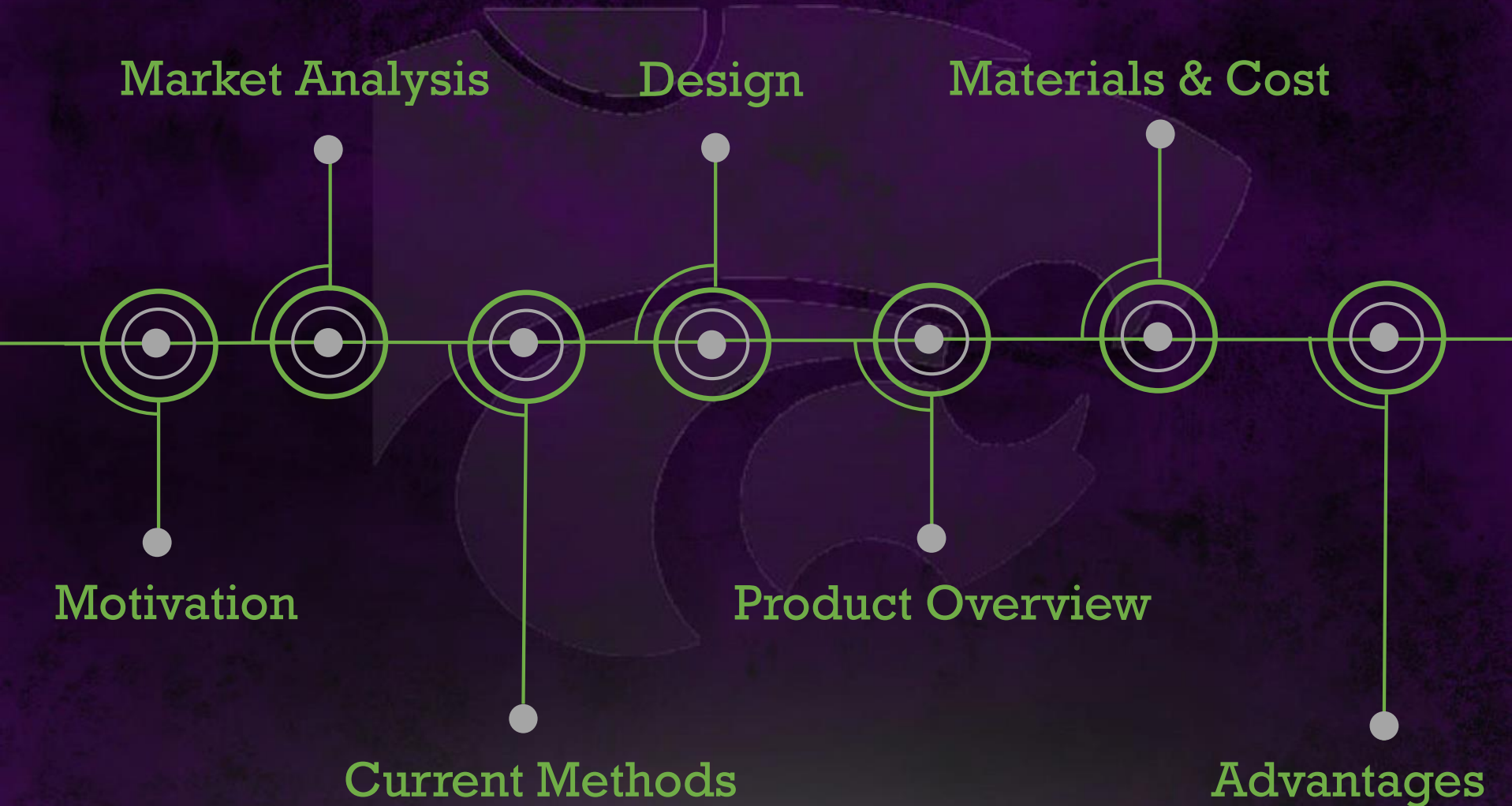
Team E:

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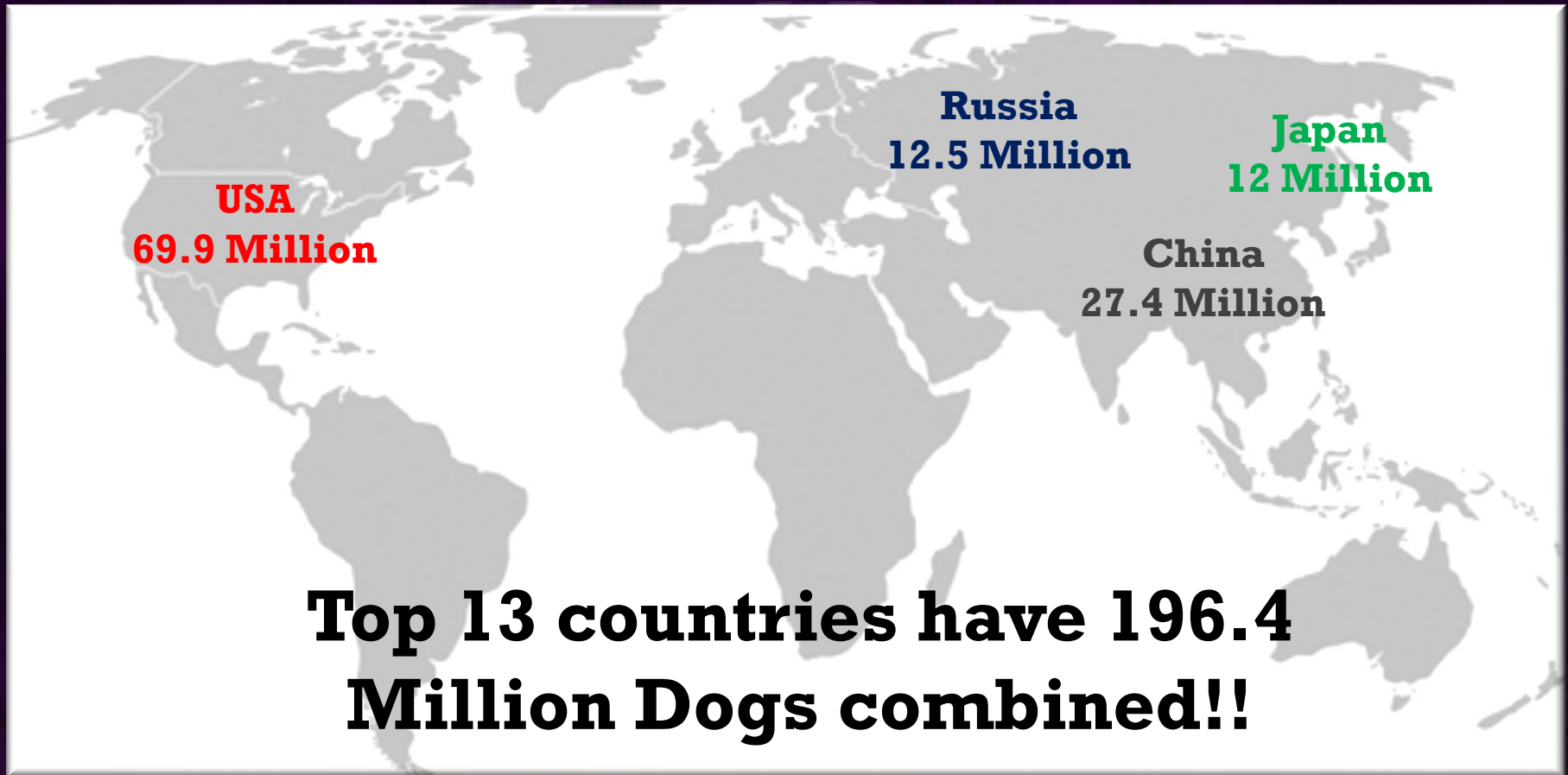
Outline



Motivation



Market Analysis



Market Analysis

\$1,549
spent
on each
dog
annually

Pet
ownership
in the US
has tripled
since 1970

Over half of
U.S.
households
own a dog

\$60.28
billion
total spent
on dogs in
2015

77% of
owners see
dogs as
family
members



Anti-Digging Spray

- Intense smell to deter dog from digging
- Sprayed directly on the ground
- Expensive to cover large area
- Can damage yard





Underground Fence

- Act as barrier to prevent escape
- Prevents digging around fences
- Doesn't prevent damage to yard
- Can be complicated to install
- Doesn't correct behavior





Anti-Digging Boots

- Goes directly on dogs feet
- Prevents digging into ground
- Dog tears them off
- Doesn't correct behavior





Shock Collars

- Send shock through animal when unwanted behavior is detected
- Used in training
- Requires owner to be present
- Does not target digging





walk



amble



pace



trot

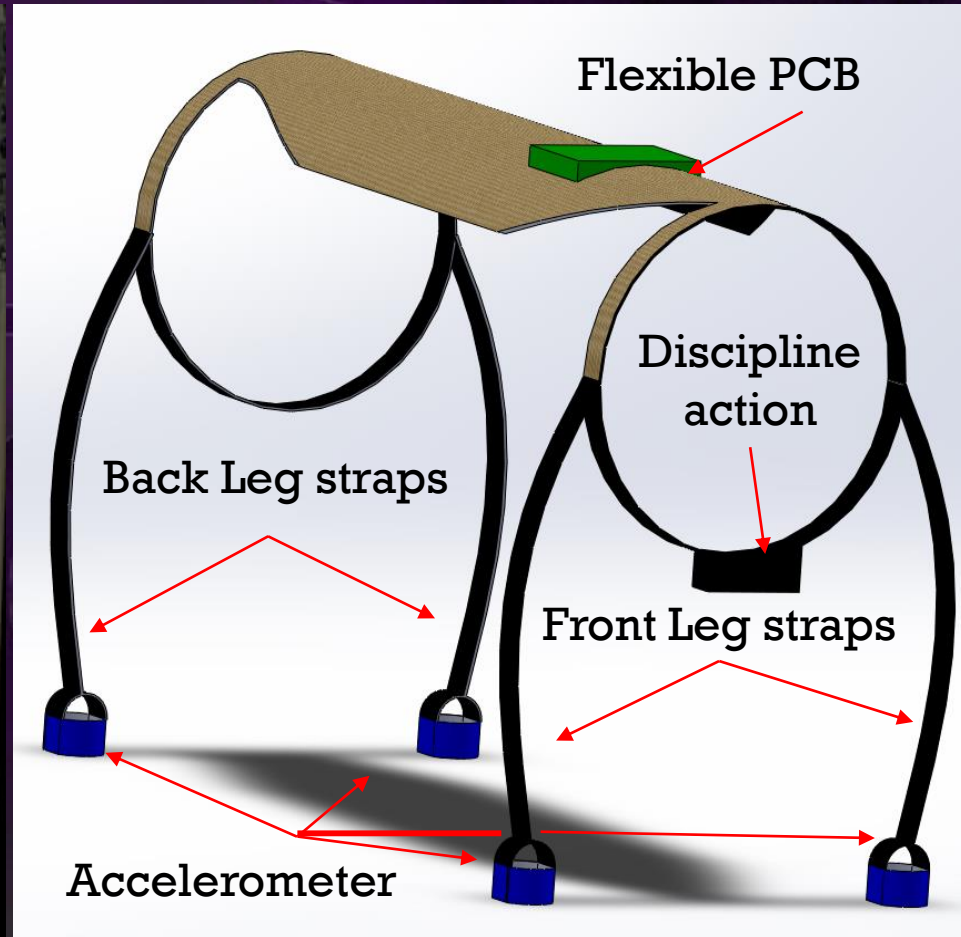


canter



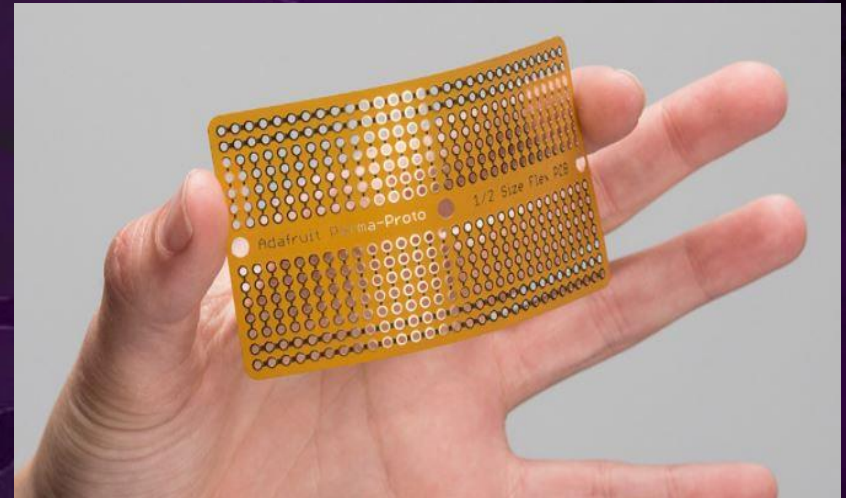
gallop / run

Design



Flexible PCB Design

- Manufacturer: Smart Prototyping
- Flexible board will conform to harness
- Make the harness more comfortable
- Easier to weather proof



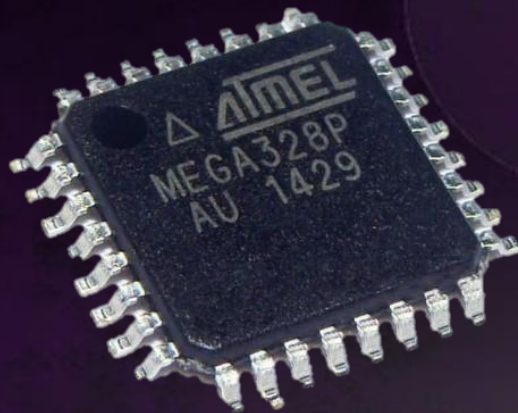
PCB Orders		\$167.50
		DETAILS ▲
Material	Flexible PCB	
Layers		2
Dimension Length (mm)		50
Dimension Width (mm)		50
PCB Quantity		10



Main Components

Microcontroller

- 23 programmable I/O lines
- 1.8 - 5.5V operating voltage
- 6 PWM channels
- 2KBytes Internal SRAM

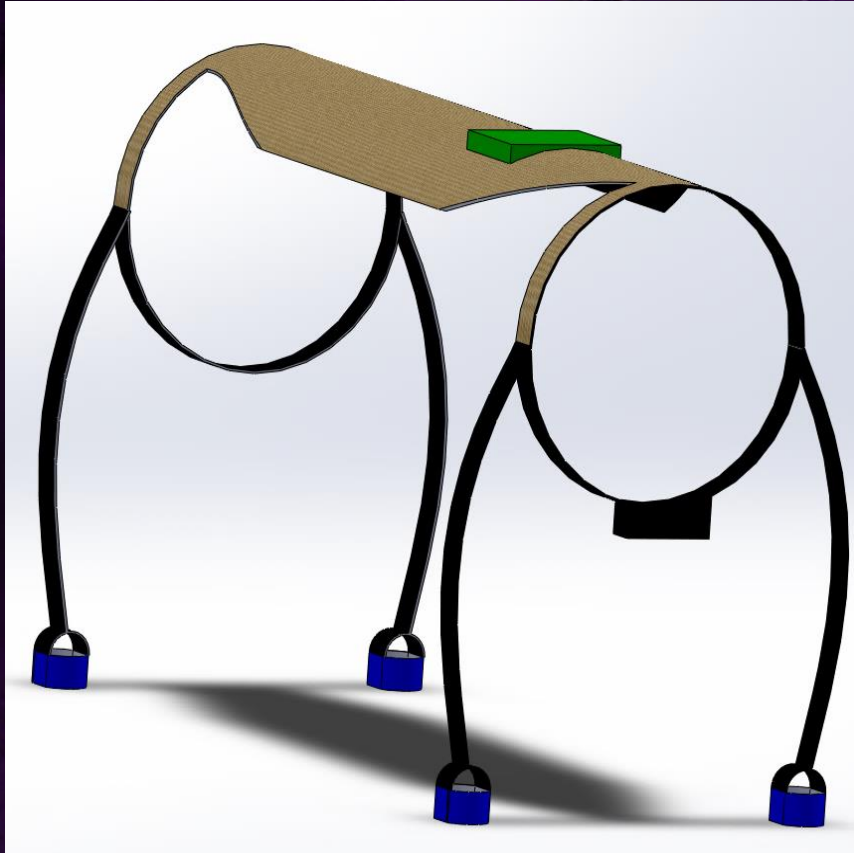






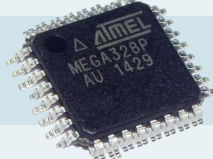
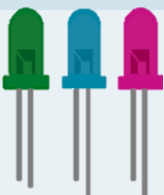
Accelerometer

- 2g/4g/8g dynamic selectable scale
- 6 μ a (ISR) to 165 μ a current draw
- 1.9 - 3.6V operating voltage
- Static orientation detection

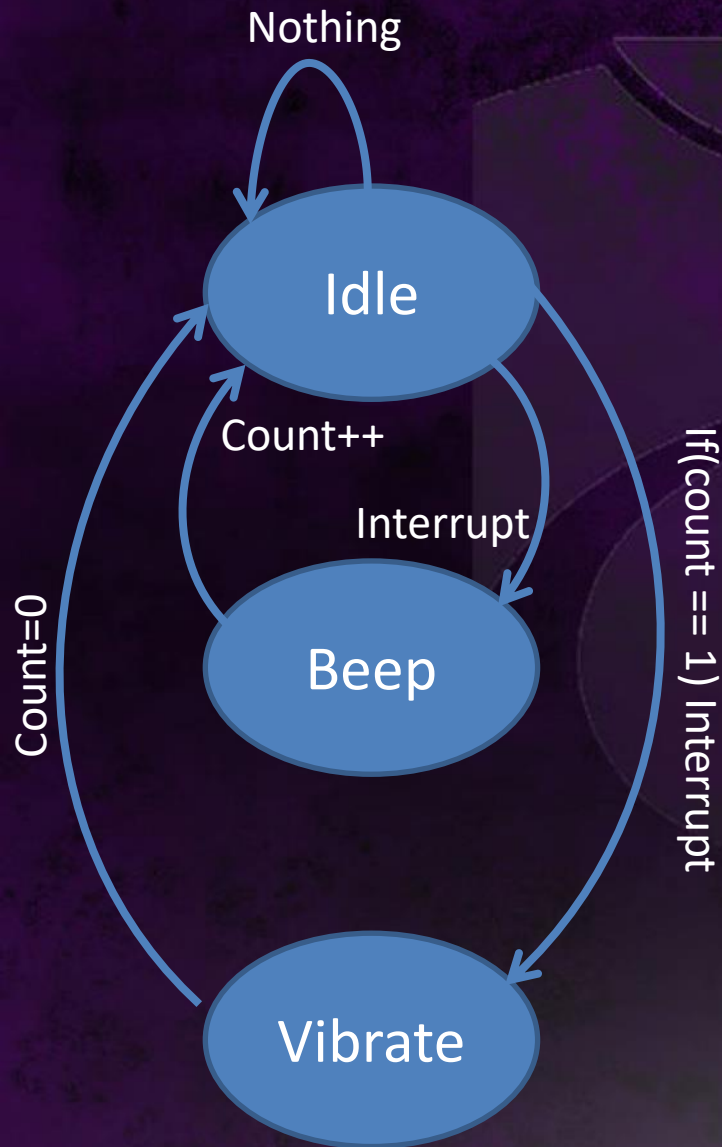


Materials & Cost



Item		Cost
Accelerometer		\$7.56
Vibration Motor		\$6.00
Piezo Buzzer		\$1.50
Rechargeable Battery		\$7.77
Microcontroller		\$1.50
LED Battery Indicator		\$0.75
Dog Harness		\$15.00
Total Estimate		\$40.08

Animation of Dog-Digging



Advantages



QUESTIONS?



References

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