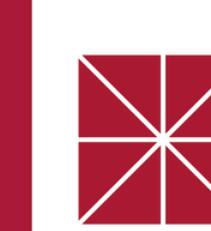




# PestPatrol Sentry Bot

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# Creating Team



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# Ideation Background



# Problem Statement

Customers find it frustrating when pests like raccoons wreak havoc on their gardens and property. This can be extremely debilitating to their lifestyles.



# Problem Analysis

Dangers of Rodent Repellant:

Many rodenticides use second-generation anticoagulants:

- Rodents experience painful deaths
- Humans, pets can also be seriously harmed if contact is made

Rodent Harm:

- 14.8M households in U.S. have reported incidents with rodents
- Serious damage can be done to garden and home infrastructure
- Raccoons carry many diseases which can harm both humans and pets alike



# Solution: Pest Patrol Bot

An automated defense bot, controlled by a Jetson Nano, trained with object detection software to fire water on any pests that are identified as nearby.



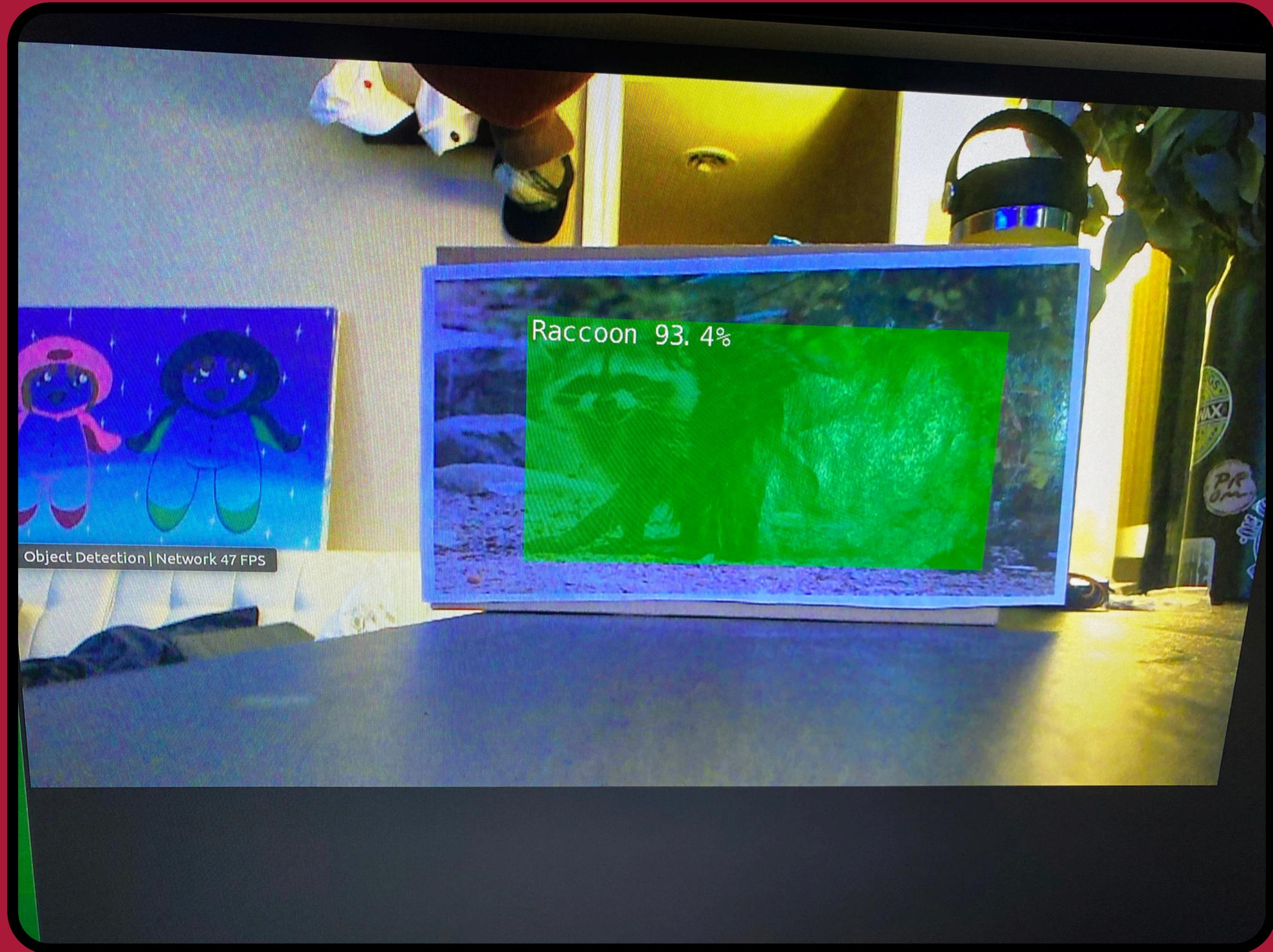
## MobileNet:

- Neural Network model pre-trained on categorized and labeled images (SSD Architecture)
- We used NVIDIA Jetson-provided libraries
- Utilizes TensorRT (increases model performance efficiency)

# Demo



# Demo



# Business Model

## Target Customers

Our initial focus will be homeowners in urban areas.

- Before expanding PestPatrol's defense variety, the goal will be to solve the raccoon issue.

## Future Plans

As the PestPatrol bot is improved upon, marketing will begin reaching out to industrial farming groups.

## Market Info

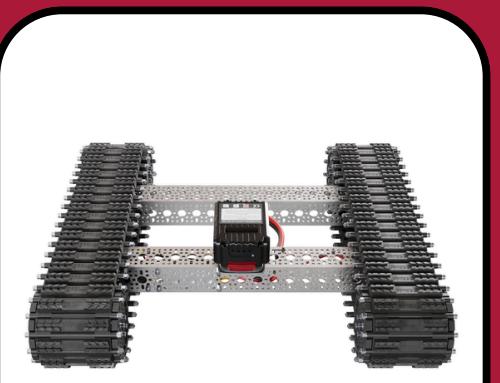
PestPatrol bots will be sold utilizing different eCommerce services as a easy-to-setup solution to the rodent issue.



# Multi-Generational Mapping

## Pilot Gen 0

- Raccoon object detection
- Water gun
- Stationary
- Plug-in for power

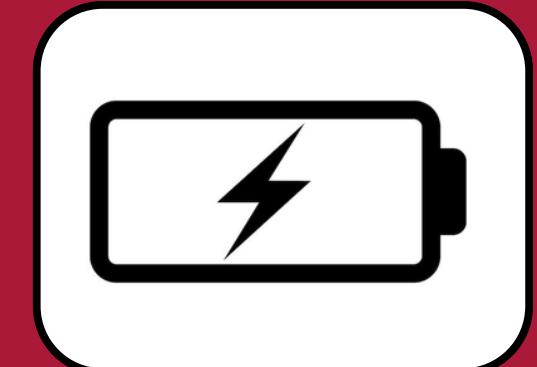


## Generation 1

- Expand detection capabilities to other rodents
- Utilize natural pest repellents
- Turret-like automated tracking
- Plug-in for power

## Generation 2

- Expand detection capabilities to large insects
- Night vision detection
- Utilize natural pest repellents or a non-lethal pellet launcher
- Automated movement to patrol area using lidar system
- Recharges battery at dock



# Tradeoff Analysis/COGS

Generation 0		Generation 1		Generation 2	
Component	Cost	Component	Cost	Component	Cost
Camera	\$20.00	Camera	\$35.00	Camera	\$35.00
NVIDIA Jetson Nano	\$100.00	NVIDIA Jetson Nano	\$100.00	NVIDIA Jetson Nano	\$100.00
Water Gun	\$2.00	Water Gun	\$2.00	Pellet Gun	\$6.00
Servo Motor	\$5.00	Natural Pest Repellent	\$5	Natural Pest Repellent	\$5
Power Brick	\$12.00	Servo Motors	\$30.00	Servo Motors	\$45.00
Housing	\$2.00	Power Brick	\$12.00	Recharge Station	\$20.00
Miscellaneous	\$1.50	Housing	\$4.00	Recharable Power Bank	\$30.00
		Miscellaneous	\$1.50	Treads	\$20.00
				Housing	\$7.00
				Miscellaneous	\$1.50
Total	\$142.50	Total	\$189.50	Total	\$269.50

Pro Forma	Year 1 (Gen 0)	Year 2 (Gen1)	Year 3 (Gen 2)
# of Household Rodent Incidents	14,800,000	14,874,000	14,948,370
Market Penetration	0.005%	0.02%	0.05%
Price of Unit	\$200.00	\$249.00	\$349.00
Units Sold	740	2,975	7,474
Revenue	\$148,000.00	\$740,725.20	\$2,608,490.57
Cost per Unit	\$142.50	\$189.50	\$269.50
Manufacturing Costs	\$105,450.00	\$563,724.60	\$2,014,292.86
RnD Costs	\$20,000.00	\$20,000.00	\$40,000.00
Profit	\$22,550.00	\$157,000.60	\$554,197.71

# NPV and IRR

## Projected Cash Flows

Year	Cash Flow
0	<b>\$(30,000.00)</b>
1	<b>\$22,550.00</b>
2	<b>\$157,000.60</b>
3	<b>\$554,197.71</b>

## Calculations

**Growth Rate of Consumer Electronics Industry: 5.01%**

**Growth Rate of Pest Control Industry: 5.00%**

Using this information to identify a discount rate without our own historical data, we predict an analogous industry IRR of around

**5.005%**

Thus, meaning the PestPatrol product has an NPV of:

**\$612,534.21**

# Thank you!

Any questions?