



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

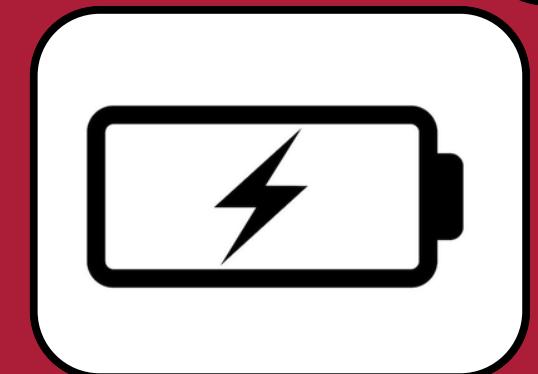
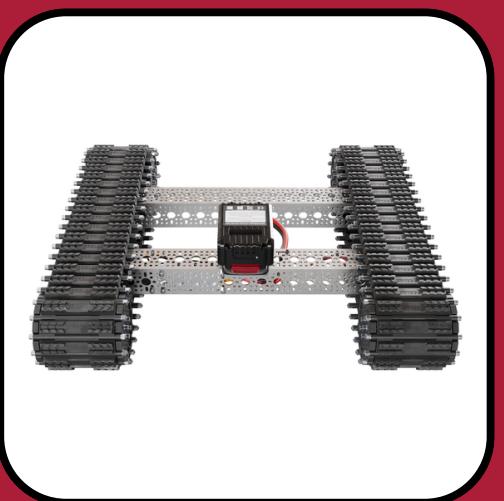
Pilot Gen 0

- 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	\$(30,000.00)
1	\$22,550.00
2	\$157,000.60
3	\$554,197.71

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?