

# Smart Plant Caretaker

Nathan Lee, David Luo, Archie  
Deng, Ryan Nguyen, Henry Do

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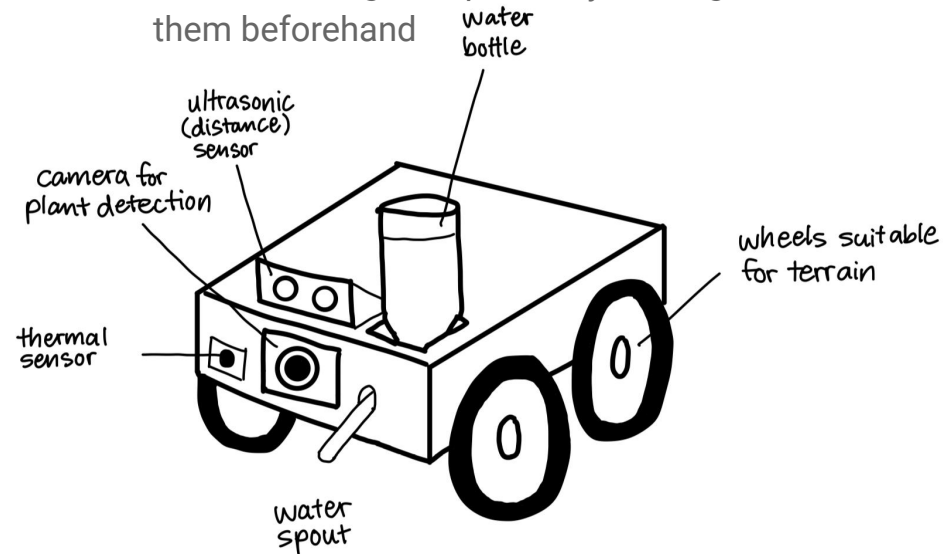
# Problem

- Addresses the problem of irrigation on gardens that are sparsely covered by individual plants.
- Human labor and time needed to water plants
- Requires built infrastructure, and infrastructure is often fixed.



# What is a Smart Plant Caretaker?

- A small robot on wheels that periodically moves around the perimeter of a consumer's garden
- Used in gardens where the plants are equally spaced and spread out.
- When encountering a plant in front of it, it dispenses water
- Avoids running over plants by moving around them beforehand



# Market

- 18.3 million U.S. households started gardening in 2021.
- 55% of people garden to create a beautiful space, and 43% garden to grow food.
- The average U.S. garden is 600 sq.ft. and produces \$600 worth of food.
- The average return on food gardening investment was 757% in 2021.
- People garden 5 hours a week on average.

Source:

<https://www.rubyhome.com/blog/gardening-stats/#:~:text=The%20U.S.%20is%20one%20of,U.S.%20garden%20is%20600%20sq..>

# Feasibility

In 10 weeks, we aim to implement robot movement and its main goal to water plants that it encounters.

- Large focus on robot design and plant recognition (object detection)
- If extra time, we plan to add more features
  - Weed killer
  - Fertilizer Spreader

By planning ahead to debug errors early on and dividing the work evenly with our members based on our strengths and weaknesses, our project would be feasible to complete within this time frame.

# Potential Risks

- Outdoor conditions could damage the robot (rain, snow)
- Water tank could be too big/heavy for robot
- Robot could have trouble moving on uneven surfaces
- Robot could water the same plant twice

# Plan B

- Apply remote or manual control of the waterer in case ai detection is not able to be fully implemented
- Use remote or manual control of robot movement if random movement can't be accomplished

# How will work be split among team members?

- The two sections we will focus on are plant AI image detection and the robot's ability to move in random directions and spray water
- Within these groups we can have 1 person focused on the hardware (wiring and assembling the devices) and the other person focused on the software



# Budget

- Current Budget: \$130

Materials	Cost
Robot (wheels, frame, motor), self-built vs. bought pre-made TBD	\$50
Camera (1+)	\$30+
Water container / tank materials	\$10
Sensors (distance, moisture, thermal, etc)	\$30
Batteries	\$10
Total	\$130

# Fundraising Plan

- **Kickstarter Campaign:**
  - Create a visually appealing and informative campaign page with images, videos, and detailed descriptions of the robot.
- **Personal Network Outreach:**
  - Friends and Family
  - Alumni Network
- **Contact Plant/Agriculture Companies:**
  - integration of their product,
  - joint marketing initiatives,
  - data sharing for research.
- **Online Campaign:**
  - Utilize social media and content marketing to reach a wider audience and drive interest.

# Deliverables + Schedule

	AI / Camera	Robot
Week 3	Get started on AI / pseudocode main functions	Finish design of robot and begin setting up with Pi/STM
Week 4	AI plant recognition	Connect camera/sensors to robot / robot movement control
Week 5	AI integration with STM/Pi/Robot	Connect camera/sensors to robot / robot movement control
Week 6	Have prototype done (at least: moving robot that can manually water + detect plant)	
Week 7	Extra features / troubleshooting	Extra robot design
Week 8	Extra features / troubleshooting	Extra robot design
Week 9	Extra features / troubleshooting	Extra robot design
Week 10	Increase AI accuracy, finish presentation	Optimize functions/sensors, add weed killer / fertilizer