

“YingXao” Automatic EcoGardener



ECE 4872 Senior Design Project Proposal Presentation

Presenter: Yilun Chen, Yida Wang, Xi Li, Yihan Jiang

Meet Our Team



Hardware Lead: Yida Wang



Project Manager: Xi Li



Software Lead: Yihan Jiang

Motivation

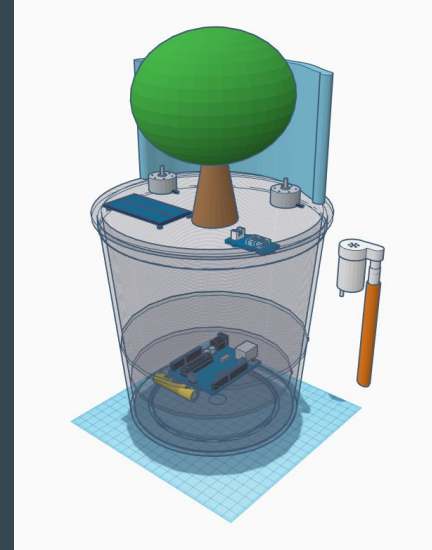
- Smart Gardening
- Existing products:
 - Too **expensive** : \$2,500+ per unit
 - Use artificial lighting. Not **env-friendly**
 - Too big. Not **portable**
- We also want it to:
 - Constantly **improve its gardening plans**
 - Better **user-plant interaction**



<https://mygardyn.com/>

30,000 Ft High-level Design

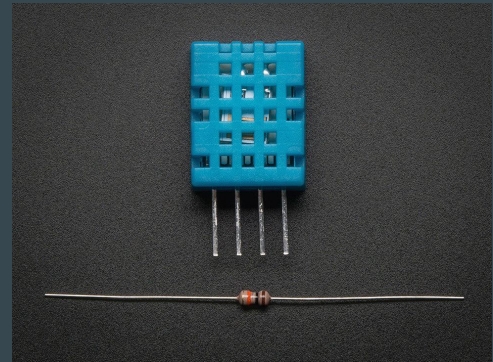
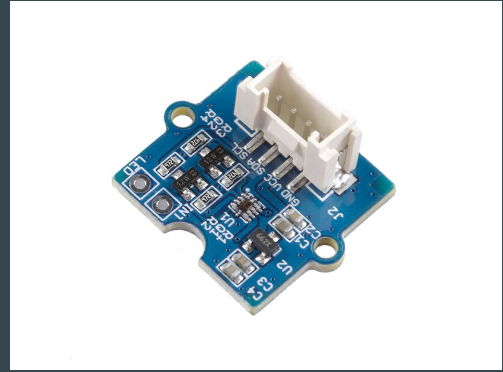
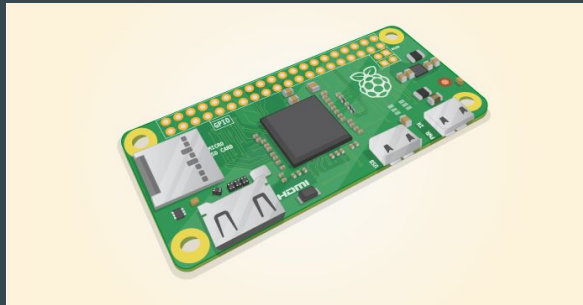
- Interplay of software and hardware
 - Physical Device
 - Interact with sensors and actuators
 - Cloud Service
 - Provides gardening plans
 - App
 - Provides an interaction/monitoring interface
- Project goals
 - Users don't need to take care of the plants themselves
 - Smooth and easy setup workflow
 - Unit cost below \$100



Picture: Conceptual Design of YingXao

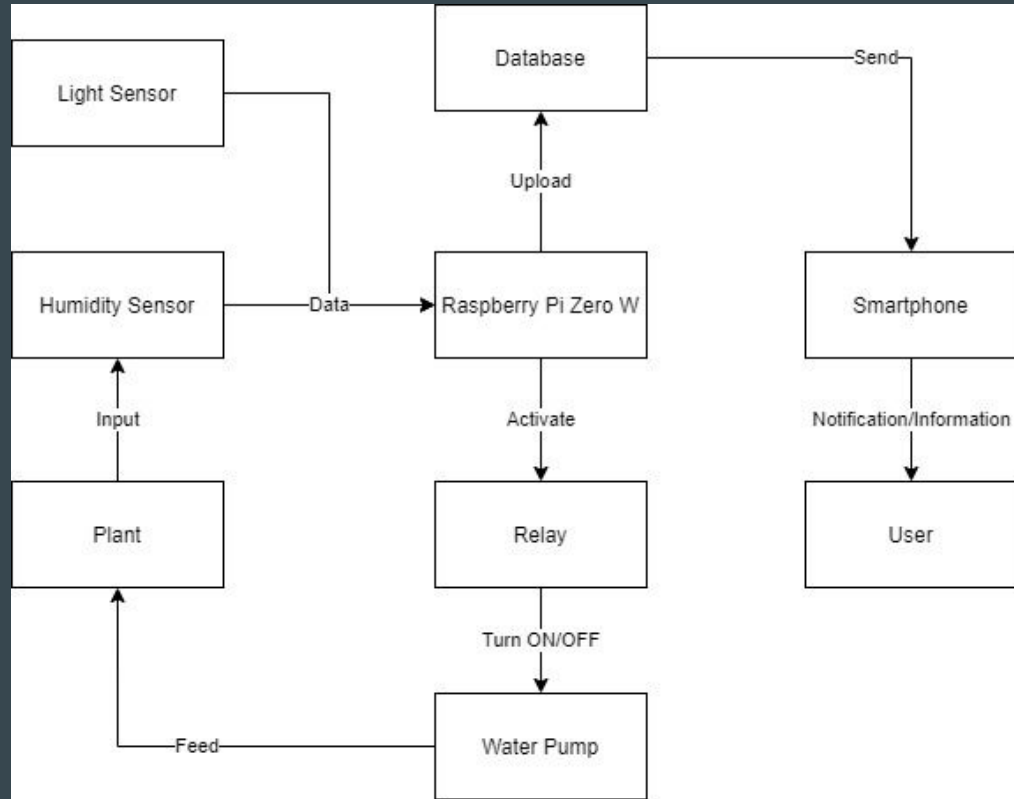
Tech Specs

- Raspberry Pi Zero W
 - Fast processing speed, low cost and high compatibility
 - Bluetooth and internet
- DHT11 basic temperature-humidity sensor
 - Ultra low cost and simply
- Grove - Sunlight Sensor
 - Wide spectrum detection range and detect sunlight directly



Design Approach

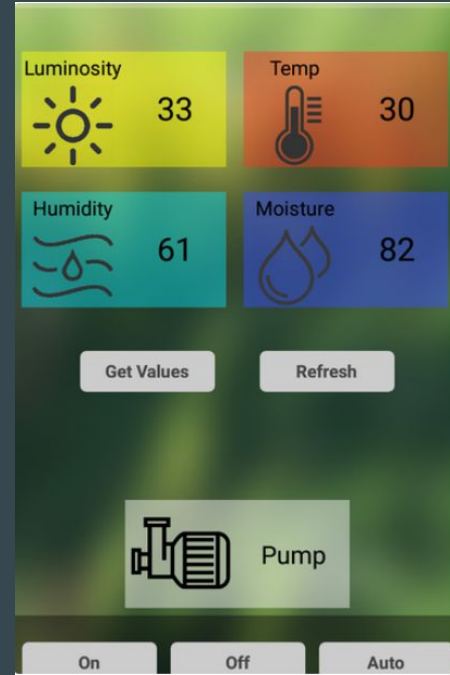
- Sensing
Light and Humidity
- Control
Pump and light blocking
- Communication
Pi zero and App



Conceptual UI of App



Notification :
Potassium running low.



<https://www.instructables.com/Raspberry-Pi-Powered-IOT-Garden/>

Cost

Target unit price: \$100

Target sales volume / year: 2500 units

Cost / unit: \$71.03

Profit / unit: \$28.97

Total profit / year: \$72425

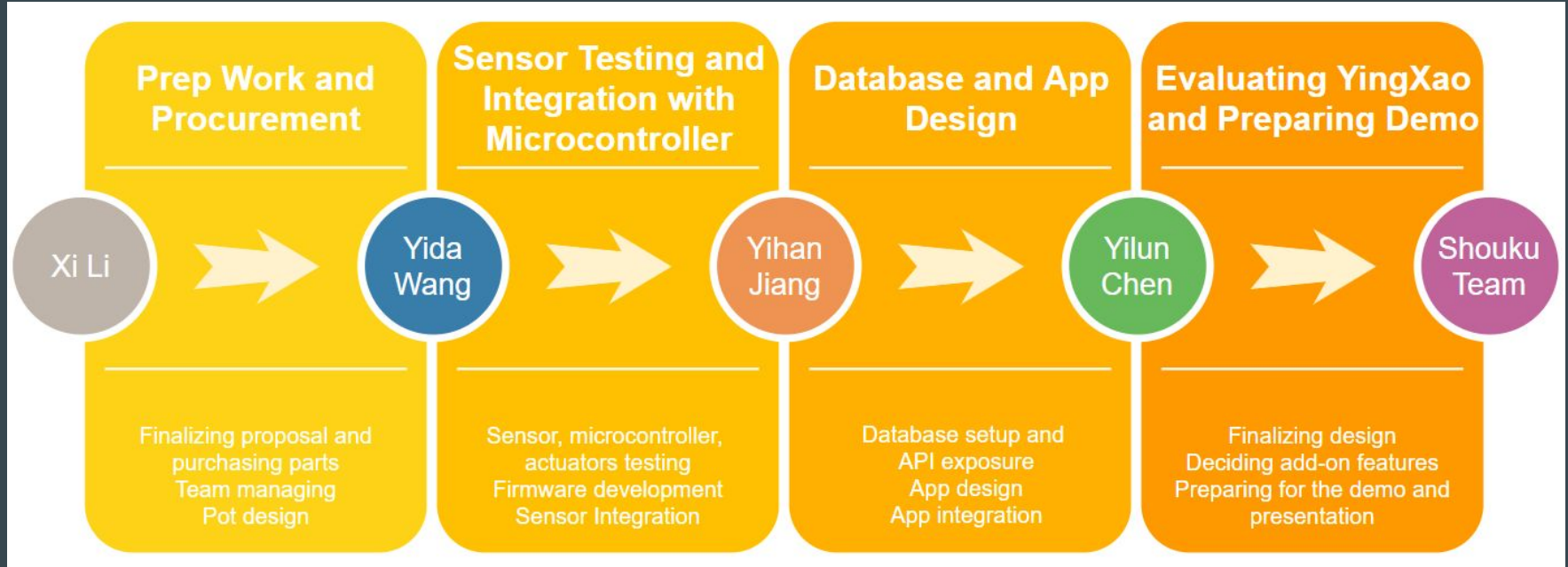
Parts:	
Plastic Pot	\$0.71
Micro-controller (Raspberry Pi Zero W)	\$15.00
Sensors	\$8.00
Battery	\$5.00
Tupperware	\$5.35
Light Shield	\$1.14
Assembly	\$1.00
Packaging	\$0.50
Testing	\$0.50
3. Package	\$0.50

Non-Reoccurring Cost					
		Number	Salary/Yr	Months	Cost
1. Research and Development					
Employees					
	Engineers	4	\$80,000.00	3	\$80,000.00
2. Production					
Setup Charges					
	Engineers	1	\$80,000.00	0.5	\$3,333.33
Total Non-Reoccurring Cost					\$83,333.00

Schedules and Milestones

	01/20	01/27	02/03	02/10	02/17	02/24	03/03	03/10	03/17	03/24	03/31	04/07	04/14
Prep Work and Procurement													
Parts Testing													
Sensor Integration with Microcontroller													
Pot Design													
Database and app design													
Presentation / Demo Preparation													
Test and evaluate YingXao													
System Finalization													
Add-on Features													
Prepare demo and presentation 📄													

Critical Path



Project Demo

- What will we present?

Physical body of the gardener & the app that monitors the gardener

- How will we present?

Poster, Flyer -> Design overview and concept map

Live demonstration -> Specific functions

1. App Setting
2. Sensor Reading
3. Pump and Light Shielding



Thank you!