


ECE 4871 Project Summary

Project Title	"YingXao 英招" Automatic EcoGardener
Project Logo	
Team Members (names and majors)	<div>Yihan Jiang (Computer Engineering)</div> <hr/> <div>Yida Wang (Computer Engineering)</div> <hr/> <div>Xi Li (Electrical Engineering)</div> <hr/> <div>Yilun Chen (Computer Engineering)</div> <hr/>
Advisor / Section	Dr. Linda S Milor
Semester	Fall 2020 ECE 4871

**Project
Abstract**

(250-300 words)

(10 point font, single spaced)

YingXao is embedded system design that can completely automate the process of taking care of the plant with a plan specifically tethered towards the needs of that particular species.

To achieve this, we need a low-cost low-power microcontroller unit that can sit near the vase with environment sensors (humidity, temperature, luminosity, etc) connected in order to monitor the status of the plant. We will build an internal water cycle to make save water resources and add required nutrition for plants(nitrogen, phosphorus, and potassium)

The system will be plugged into wall power and equipped with a rechargeable LiPo battery as a backup power source.

In addition, the microcontroller unit requires internet connection capabilities(Wifi module) in order to acquire data from our pre-established database where we store caring plans for different species of plants.

Microcontroller unit will be able to communicate with users through smartphone by a mobile-based UI

The end user of this product will be able to connect the device to WiFi, set the caring configuration from a web/mobile-based UI and enjoy the convenience of automatic plant caring brought by YingXao

Size of vase(Graph)



Figure 1. Size of plant

Project Title	
List codes and standards that significantly affect your project. Briefly describe how they influenced your design.	<p>(10 point font, single spaced)</p> <ul style="list-style-type: none"> • Institute of Electrical and Electronic Engineers (IEEE) • Coordinated with ANSI, ETSI and other standards organizations (e.g. IEEE/ANSI N42) • IEEE 802.xx standards are most cited and concentrate on telecommunications • IEEE 1666 standards concentration on software • Environmental Protection Agency (EPA), Occupational Safety and Health Administration (OSHA), Consumer Product Safety Commission (CPSC)
List at least two significant realistic design constraints that applied to your project. Briefly describe how they affected your design.	<p>(10 point font, single spaced)</p> <p>1) Power consumption</p> <p>2) Size and cost of battery: the solar panel is environmentally-friendly but relatively expensive for a vase. It is important to choose a cheaper one, such as the lithium battery.</p> <p>3) Glass filter for sunlight: we need to carefully choose the color of the outside cover in order to accommodate the individual sunlight requirements of plants.</p>
Briefly explain two significant trade-offs considered in your design, including options considered and the solution chosen.	<p>(10 point font, single spaced)</p> <p>Higher price will make project more effective but less attractive for potential customers</p> <p>More powerful MCU's (Like Raspberry) provide additional functionalities and comparative ease to use, but are more power-hungry and costly.</p>

<p>Briefly describe the computing aspects of your projects, specifically identifying hardware-software tradeoffs, interfaces, and/or interactions.</p> <p><i>Complete if applicable; required if team includes CmpE majors.</i></p>	<p>(10 point font, single spaced)</p> <ul style="list-style-type: none"> • The MCU reads data from environment sensors • The MCU controls actuators to adjust humidity levels / luminosity levels, etc. • The MCU pulls data from a remote database • The MCU hosts a web page as an UI • The MCU supports sleep mode for low power. • The MCU uses RTOS.
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Project Title	
<p>Leadership Roles</p> <p>(ECE4871 & Forecasted for ECE4872)</p> <p>(NOTE: ECE4872 requires definition of additional leadership roles including:</p> <p>1.Webmaster</p> <p>2. Expo coordinator</p> <p>3. Documentation</p>	<p>ECE 4871</p> <p>Hardware Lead: Yida Wang</p> <p>Software Lead: Yihan Jiang</p> <p>Project Manager: Xi Li</p> <p>Documentation Administrator : Yilun Chen</p> <p>ECE 4872</p> <p>Documentation Coordinator: Yilun Chen</p> <p>Project Manager: Xi Li</p> <p>Webmaster: Yida Wang</p> <p>Expo Coordinator: Yihan Jiang</p>

<p>International Program:</p> <p>Global Issues</p> <p>(Less than one page)</p> <p>(Only teams with one or more International Program participants need to complete this section)</p>	<p>(10 point font, single spaced)</p> <p>N/A</p>
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