AutofarmOS Project Proposal

Basic Script

October 25, 2019

SCENE I (INTRODUCTION)

FADE IN:

**DIG. TITLE SLIDE - LOGO AND TEAM NAME**

KRISTI

Hi, we’re AutofarmOS, the embedded programming component of the Terrafarm start-up project.

**DIG. TEAM SLIDE - TEAM NUMBER AND MEMBER NAMES**

KRISTI

Our team consists of Matt Cherry, Kyle Curry, Kristi Daigh, Zach Freund, and Ethan Lefert

**DIG. TERRAFARM SLIDE - FRANK BASIC INFO AND TERRAFARM LOGO**

KRISTI

To give you an overview of the product, we have Frank Luse, a business major at KU and one of the founding members of the Terrafarm start-up.

**INT. PROFESSIONAL INTERVIEW SHOT**

\*Unscripted Frank Interview- Frank explains the overview of the product and explains the roles of each team\*

*NOTE: Include any sections of the description that Frank does not hit on before moving on.*

KRISTI

The overall product goal for Terrafarm is an autonomous vertical farm about the size of a refrigerator with a full-featured software suite. However, they must first develop a minimum viable product, which in this case, is a single module of the vertical farm along with basic software. Our team hopes to support this development by creating an operating system and drivers for the farm module.

By working with Terrafarm, we hope to help push the world towards greener forms of agriculture. Some goals of this product include eliminating food waste, improving produce freshness and nutritional content, increasing food security and accessibility, and making cities more sustainable and self-sufficient.

Additionally, we as a team are excited about the opportunity to explore new development territory by working with embedded systems and by undertaking a large, multi-team project.

The end result for our project is a fully functional embedded system within the Terrafarm prototype that interfaces with the farming module as well as other software components.

KRISTI

Our project can be divided into two main components: hardware design and software development. First, I’ll give an overview of the hardware design component. Here’s a detailed diagram of the prototype module. [Show hardware diagram]

Based on this specification, we’ve designed an embedded scheme that uses two systems. The first system includes sensors connected to arduino unos, which report data to a Raspberry Pi 4. The types of sensors in this system are a hygrometer to measure temperature and humidity; a PAR sensor to measure the wavelength of light emitted by the LEDs; a probe to measure pH; a probe to measure PPM and a tank gauge.

The second system controls the actuators through a separate Raspberry Pi 4. Actuators for this system include tanks, misters, thermal pad, and LEDs. As the project progresses, these additional controls will be needed to optimize growing conditions.

The software development component of this project is fairly simple, consisting of a base operating system for the module,drivers that will connect hardware and software, and API wrappers used to communicate with external software components. The base operating system will be open-source, selected by our team based on hardware compatibility. The drivers, which will either be provided by the sensor manufacturers or written by our team, will have two main functions: to get data from the sensors, such as information about growth conditions, and to send commands to the actuators, which will control the LEDs and the watering of plants. The API wrappers will allow the other software components, potentially written in other languages, to interact with the sensors and actuators of the module.

We plan on spending most of our software development time on testing and diagnostics. In this software overview, you can see that our embedded system sends data to and receives commands from other software components that are being developed by other teams in this class. Since the software components are being designed separately, we will need to generate simulations for the sending and receiving of data from our system .