Project presentation

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Agenda

- System overview
- Project demo
- Documentation
- Repository and files

A gravity-fed irrigation system

System overview

The project work is an autonomous, gravity-fed, irrigation system that is designed to water plants based on the daily temperature.

The work was divided into three main phase:

- **Design**: 3D and 2D components were modelled and prepared for fabrication using laser cutting and 3D printing.
- **Assembly**: All electronics were connected and integrated with structural components, including the enclosure, stand, hoses, solar panel and water tank.
- **Testing**: The system was iteratively tested and refined to ensure reliable functionality in its intended environment.

Main components and processes:

- **Microcontroller**: Raspberry Pi Pico H
- **Sensors**: Temperature and water level sensors
- **Actuator**: Electronic valve
- **Power source**: Solar panel and battery
- **Enclosure**: Custom-built 3D printed/laser cut
- **Structure components:** Water tank, hoses, and support stand
- **User feedback**: OLED display and LED indicators
- **Irrigation logic**: Temperature-based (+15) automatic watering (5h) once per 24 hours

Project demo

The irrigation system is fully functional and has been tested in its intended environment.

In the demo, you can see how the system reacts to temperature and water level changes, controls the valve, and provides visual feedback through the display and LEDs.

Project documentation
DesignEDU –platform & GitHub

Project documentation status: All finished

Reports and diary:

- Introductory report: Completed and submitted (Week 11, DEP)
- Weekly diary entries: Written for each week of the project (Weeks 12-17, DEP)
- Final report: Submitted, including hero shot, diagram, reflections, bill of materials, and final system overview (Summary report, DEP)

Presentations:

- Project idea presentation: Completed and submitted (GitHub)
- Project presentation: Completed and submitted, including demo (GitHub)

Design files:

- Laser cutting/3D printing: .svg/.stl (GitHub)
- Old sketches (GitHub)

Source code:

- Python files: main, functions, ui, oled (GitHub)

Repository and Links

Repository:
https://github.com/Kallio600/digitalfabrication.git

DesignEDU:
https://www.designedu.org/documents (Group 31)

Project demo:
https://youtube.com/shorts/nKcoVarK0_Q

Thank you

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