An Automatic Irrigation Model for a Plant Nursery

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***Abstract*—This undergraduate thesis investigates an automatic irrigation and monitoring model for a plant nursery. Seedling care requires regular observation of growing conditions and timely watering. The author designs an electronic model with Arduino programming, a Wi-Fi module, sensors, and a monitoring interface. The report documents circuit design, components, and operation of the nursery model. The conclusion says the monitoring model was assembled and worked in the reported demonstration. It also acknowledges imperfect sensing and controller response. Rain and water-level sensors, protective shades, and a better mobile application are proposed extensions. The thesis does not provide a field trial on a working nursery, measured water savings, or independently calibrated sensor accuracy. The described stability applies to the student model. The contribution is a documented student study or prototype whose stated scope can guide further testing.**

***Index Terms*—automatic irrigation, plant nursery, Arduino, Wi-Fi**

I. Introduction

Seedling care requires regular observation of growing conditions and timely watering. This thesis investigates an automatic irrigation and monitoring model for a plant nursery. It begins from a practical engineering need and explains the technologies and workflow chosen for the case. The objective is to document a student implementation or comparative investigation, together with the evidence available in the manuscript. Broader operational or economic effects require separate measurements and are not assumed from the existence of a prototype [1]. Earlier ICTU student work on related designs is included here for context [2], [3], [4]. Related published studies provide context for the subject and methods [5], [6], [7], [8], [9], [10]. These contextual works were selected for this English summary; they are not asserted to appear in the original thesis bibliography.

II. Methods

The author designs an electronic model with Arduino programming, a Wi-Fi module, sensors, and a monitoring interface. The report documents circuit design, components, and operation of the nursery model. The source is summarized through its stated design, implementation material, examples, and conclusion. Features shown in the manuscript are distinguished from proposals for later development. This review does not add a new experiment, fill missing measurements with estimates, or treat a planned capability as an observed result. The source thesis remains the provenance for the reported work [1].

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III. Results

The conclusion says the monitoring model was assembled and worked in the reported demonstration. It also acknowledges imperfect sensing and controller response. Rain and water-level sensors, protective shades, and a better mobile application are proposed extensions. The report's screens, configurations, examples, or measurements constitute the evidence for this summary. A capability described only as a design intention is not counted as a validated operational outcome. No additional performance, adoption, financial, or safety figure has been introduced here. The result is interpreted within the scope of the student's documented setup [1].

IV. Discussion

The thesis does not provide a field trial on a working nursery, measured water savings, or independently calibrated sensor accuracy. The described stability applies to the student model. A later pilot could log soil conditions, watering events, sensor error, connectivity, and plant outcomes over a defined growing period. These limitations affect how the evidence should be read. The current manuscript can support understanding of the design and reported demonstration, while independent tests would be needed for stronger claims. Any later deployment should document its environment and separate observed outcomes from intended benefits [1].

V. Conclusion

The thesis documents an automatic irrigation and monitoring model for a plant nursery. The conclusion says the monitoring model was assembled and worked in the reported demonstration. It also acknowledges imperfect sensing and controller response. Rain and water-level sensors, protective shades, and a better mobile application are proposed extensions. The thesis does not provide a field trial on a working nursery, measured water savings, or independently calibrated sensor accuracy. The described stability applies to the student model. A later pilot could log soil conditions, watering events, sensor error, connectivity, and plant outcomes over a defined growing period. Accordingly, the present contribution is a source-grounded account of the student work and its tested or illustrated scope. Claims about broader effectiveness should be assessed in later work using explicit evaluation conditions [1].

References

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