

Project Document

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This document outlines some of the projects that I have worked upon, highlighting the purpose, role, responsibilities, and results of each project.

Project Name: PIR sensor

Purpose

The purpose of this project was to design, develop, and test a security system (Passive Infrared) to detect motion and trigger actions based on human presence.

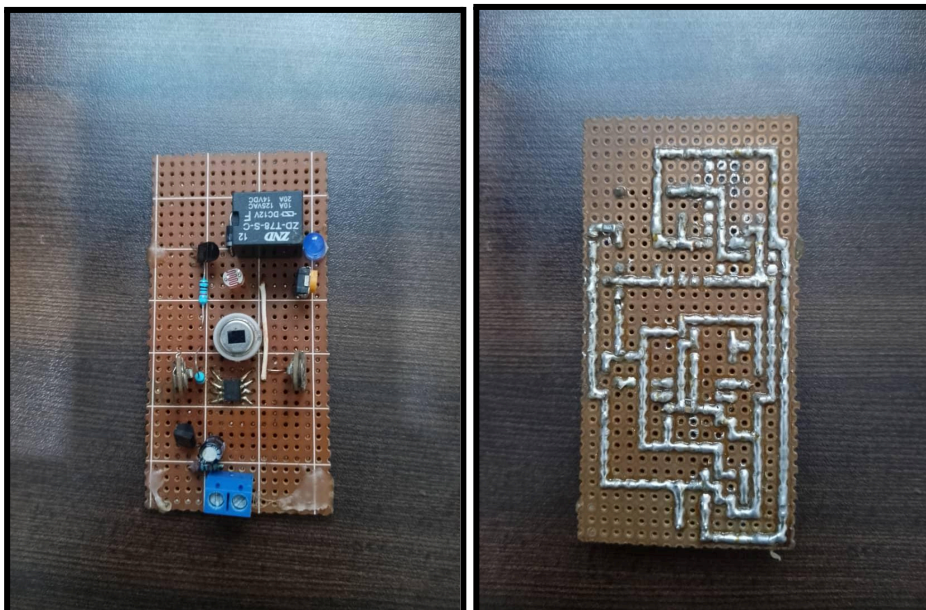
Role

Design engineer.

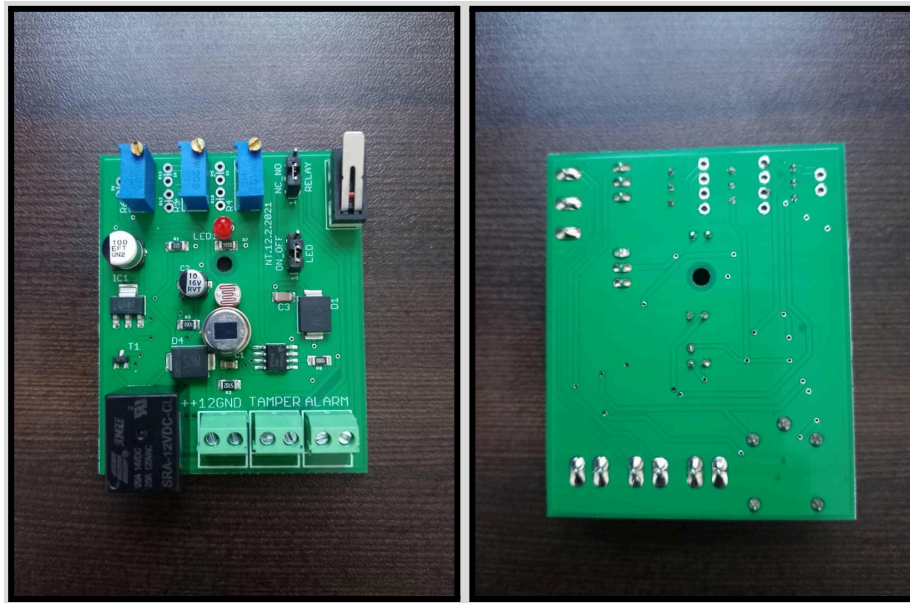
Responsibility

- Design a prototype.
- Conduct testing on the sensor's range, accuracy, functionality and reliability.
- Install and test the system in real-world scenarios.
- Test the integration of the motion sensor with other systems or devices.

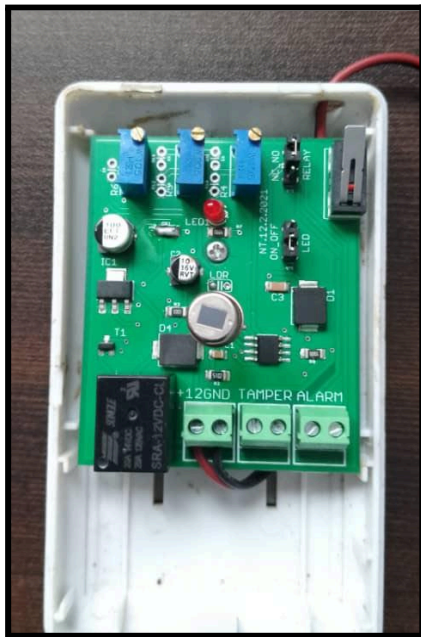
Pictures



The above are images showing the first locally made prototype before pcb design.



The above images show one of the first 5 units that were put into production after the prototype.



On the left is an image of a pir device with its top cover removed.

Results

- The PIR sensor effectively detected motion within a range of up to 20 meters, triggering actions such as lighting, Alerts.
- The system showed consistent performance in detecting human motion.
- The PIR sensor demonstrated reliable performance under different lighting conditions and temperature changes, with no significant malfunctions.

Extent of success

This sensor is well compatible with most security gadgets in terms of detection time, detection range, power usage, wiring mode etc. It is also able to switch without having an external pullup resistor to support it.”

This system passed both lab and field testing stages successfully.

Project Name: Automatic sanitizer machine

Purpose

To design and implement an automatic hand sanitizer dispenser system for public spaces to enhance hygiene, reduce the spread of germs, and ensure contactless use.

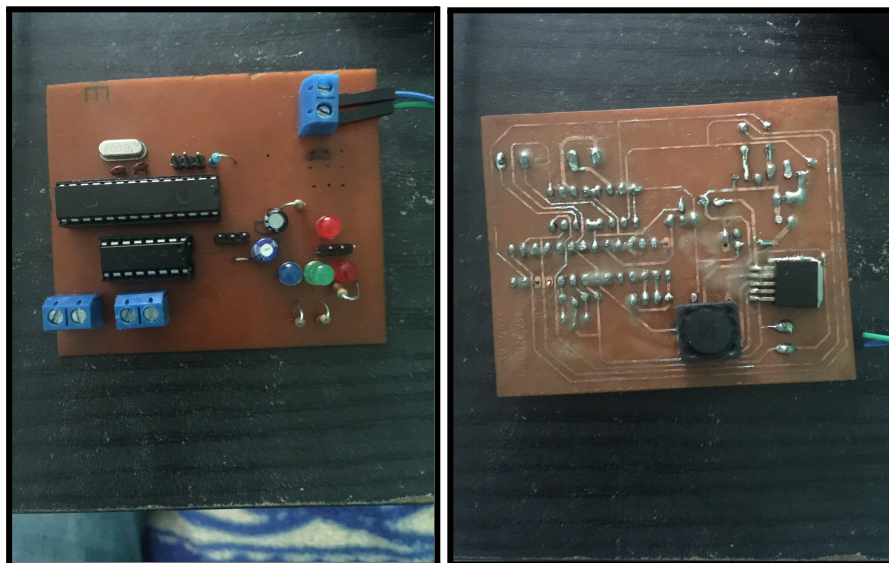
Role

Design engineer.

Responsibility

- Develop and design a printed circuit board for the control system.
- Coordinate with suppliers for parts/components such as sensors, microcontrollers, voltage regulators to build the system.
- Test the control pcb within the machine.

Pictures



The above Images show the front and back view of the automatic sanitizer machine's locally made pcb.

Results

- The automatic sanitizer machine project was successfully completed.

Extent of success

At a prototype stage, the machine was installed at a client's premises in Namugongo. The installation was smooth, and the machine was able to run smoothly for a testing period of 3 weeks. This machine was not put to mass production.

Project Name: 1KW High frequency inverter prototype

Purpose

The purpose of this project was to design, develop a 1kW high-frequency inverter that efficiently converts DC (Direct Current) power into AC (Alternating Current) for use in various applications, including renewable energy systems and backup power supplies.

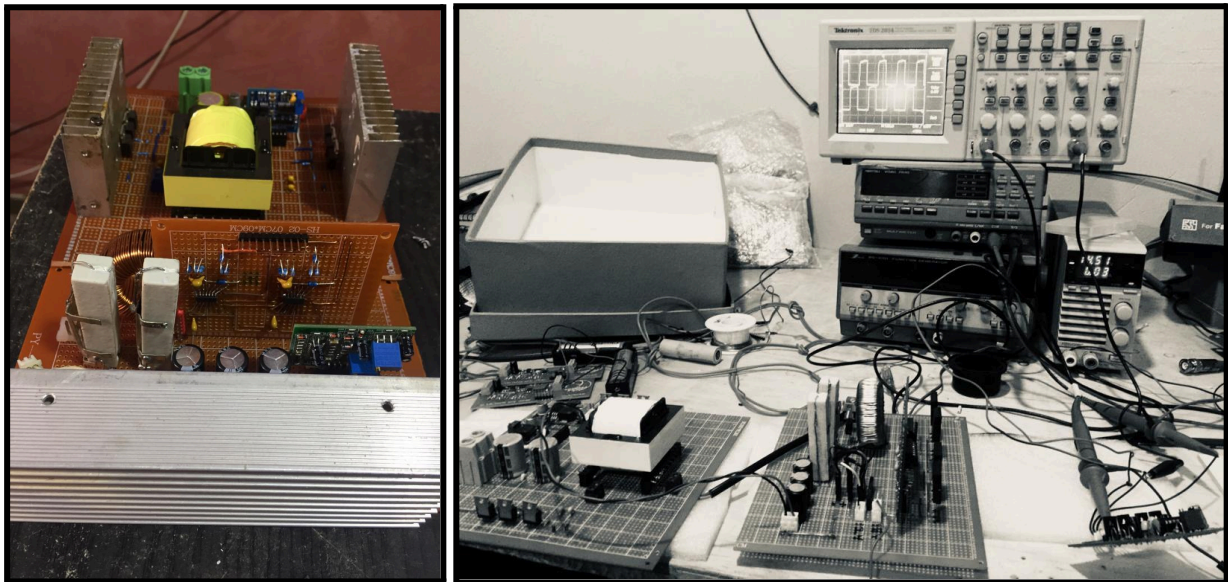
Role

Prototype design engineer.

Responsibility

- Design and develop a 1kW high-frequency inverter prototype for power conversion.
- Test the system to ensure reliable performance.

Pictures



The picture on the right shows the modular 1kw HF inverter during testing.

Results

- The 1kW high-frequency inverter successfully converted DC power (from a 24V battery) to stable AC power (230V, 50Hz).

Extent of success

This prototype generated a square wave output.

This system was not put to mass production.