Who I Am

- Ezra Lloyd
- Web developer & electronics tinkerer

What I’m Teaching

- From Arduino → to Raspberry Pi
- Exploring smart home automation

The Problem

- The Problem:
  - Stuffy indoor air
  - Condensation & humidity
  - Inefficient ventilation

Early Attempts

- Tried…
- Fan Timer — not smart enough
- Arduino — limited and requires external programming
- Raspberry Pi Zero W — versatile and self contained

The Core Idea

Compare dewpoints

(temperature - (100 – humidity)/5)

If the outdoor dewpoint is lower than the indoor dewpoint, switch on the fan.

Hardware Setup

- Hardware Components:
  - Raspberry Pi Zero W
  - DHT22 indoor & outdoor sensors
  - Relay to control fan
  - 12v DC blower fan

The Code at a Glance

```
if Odp < (Idp - 2) and wait >= 11:
    pi.write(4, 1)  # Turn fan ON
elif Idp <= Odp:
    pi.write(4, 0)  # Turn fan OFF
```

- Compare indoor & outdoor dewpoints
- Only run fan when outdoor air is drier

Smart Safeguards

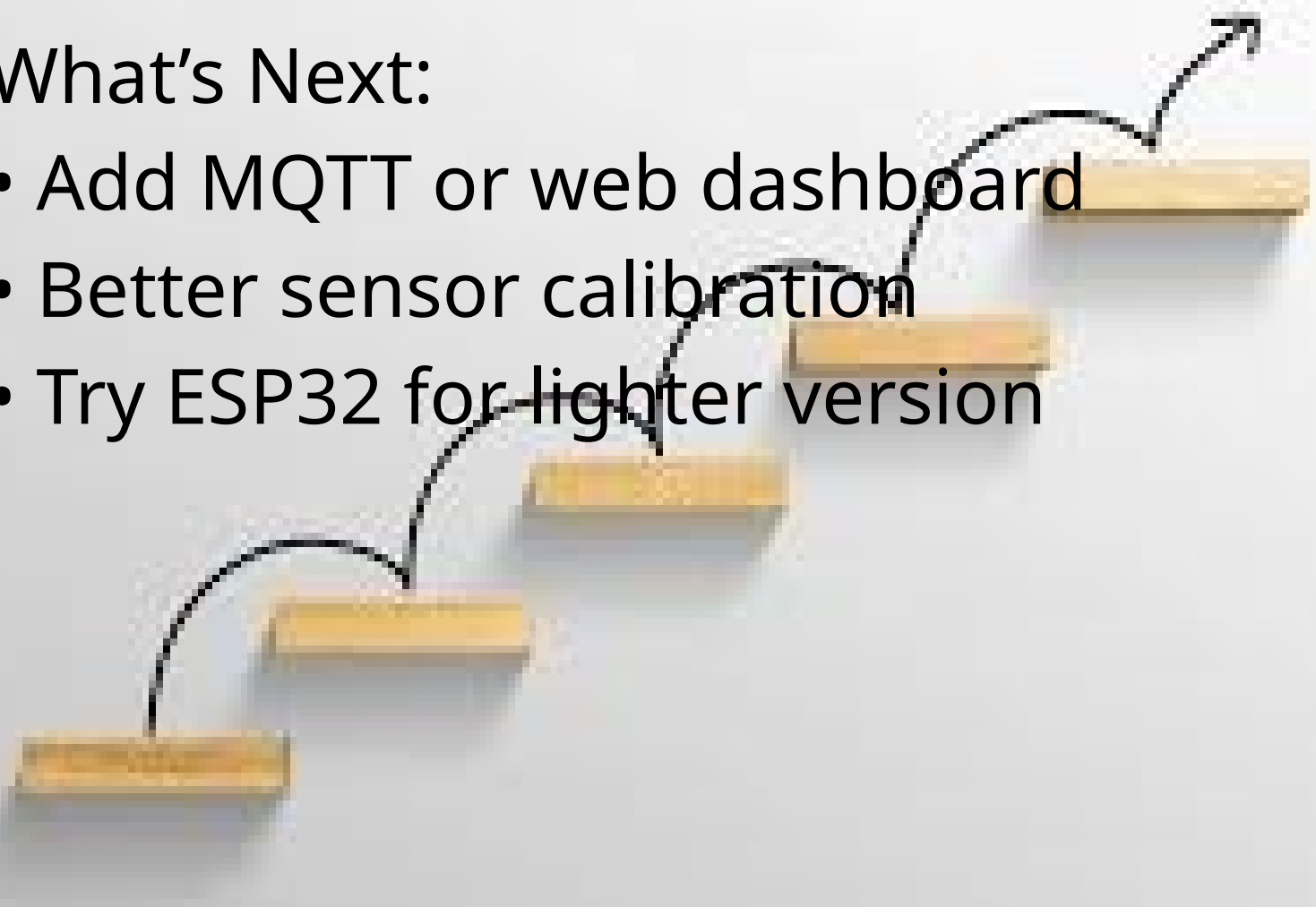
- Built-In Safety & Logic:
- Hysteresis (prevents rapid cycling)
- Temperature limits
- Auto reboot if sensors fail
- Runs fully offline

Results

- Results:
  - Consistent comfort
  - Lower indoor humidity
  - Fully automated operation

Lessons & Next Steps

- What’s Next:
  - Add MQTT or web dashboard
  - Better sensor calibration
  - Try ESP32 for lighter version



Want to build one? Let’s connect.

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