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Team 25 - PillSync: A Smart Pill Management System

Empowering Medication Adherence Through Smart Tracking

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Introduction

- Medication non-adherence is a major contributor to hospitalizations.
- Elderly and chronic-illness patients are most affected.
- PillSync improves adherence with automation + biometrics.

Theory - System Architecture & Build

- Raspberry Pi runs biometrics, scheduling, and servo control.
- Fingerprint scanner restricts access to authenticated users.
- Flask web app enables dose scheduling and configuration.
- Twilio sends SMS reminders + missed-dose alerts.
- Servo-driven dispensing tray rotates to release dose.
- Electronics system includes:
  - 5V regulated power system
  - Biometric module
  - Servo motor + tray linkage
  - Pre-dosed pill compartments
- CAD housing supports alignment + encloses electronics.

Conclusion

- PillSync integrates biometrics, automated dispensing, and SMS alerts to reduce missed doses and improve medication adherence.

Results

- Authentication succeeded in < 2 seconds.
- Servo dispensing accurate across 50+ cycles.
- Dose schedule triggered reliably.
- SMS alerts delivered on time (Twilio).
- System ran 48 hours continuously without failure.