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Design Brief: BalanceBot

Project Overview:

Fucked Up Solutions is seeking to develop a Chindogu device that will help waiters in the restaurant business to improve their tray carrying behavior. The device will measure the angle and acceleration of the tray using the GY521 module and alert the waiter or their superior about any bad tray behavior. It will also log the tray angles every 200ms and alert the kitchen if a tray is dropped. The device must be battery-driven, IoT-enabled, and use a step motor-driven pointer to show the slope angle (or adjustment angle) to alert the waiter in real-time. It must eliminates the need for tray edges, since the balance will not be off.
Target User Group: The target user group for this device is waiters in the restaurant business.

Hardware Requirements:

- ESP32
- GY521
- Step motor model 28BYJ-48-12V
- Step moter Driver ULN2003
- LEDs
- 9V battery
- Power supply 1PC
- Misc. Cables

Technical Requirements:

- The device must be able to alert when the tray is angled more than 5% to any angle.
- The device must alert real-time via a red LED that it is not in level.
- The device must log these angles approx. 200ms
- The device must alert the kitchen if a tray is out of level.
- The device must be battery-driven.
- The device must be IoT-enabled.

Design Constraints:

- The device must be easy to use for waiters and must not add any significant weight to the tray.
- The device must not interfere with the waiter's ability to carry the tray and serve food.
- The device must be durable and able to withstand daily use in a busy restaurant environment.

Deliverables:

- A working prototype of the Chindogu device that meets all the technical requirements.

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- A user manual for the device that explains how to use it and troubleshoot any issues.
- A blog on the process, including any challenges and solutions.
- A video demonstrating the functionality

Timeline: Working prototype delivered and documented no later than midnight 31. march 2023

Budget: This is a low-/no-budget prodject. Thus the prototype must be of minimal cost