The BatBox

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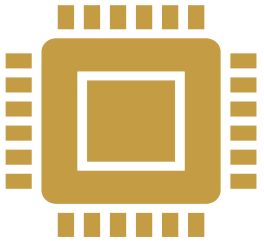
Hardware

US100 Ultrasonic Sensor

Measures distance to an object by sending out ultrasonic waves and timing the echo return

Can detect objects between 0.8 inches to 15 feet

Often operates in the range of 3V to 5V, making it compatible with most microcontrollers.



Pi Zero 2 W

Quad-core 64-bit Arm Cortex-A53 CPU running at 1 GHz, offering a significant performance boost over the original Raspberry Pi Zero.

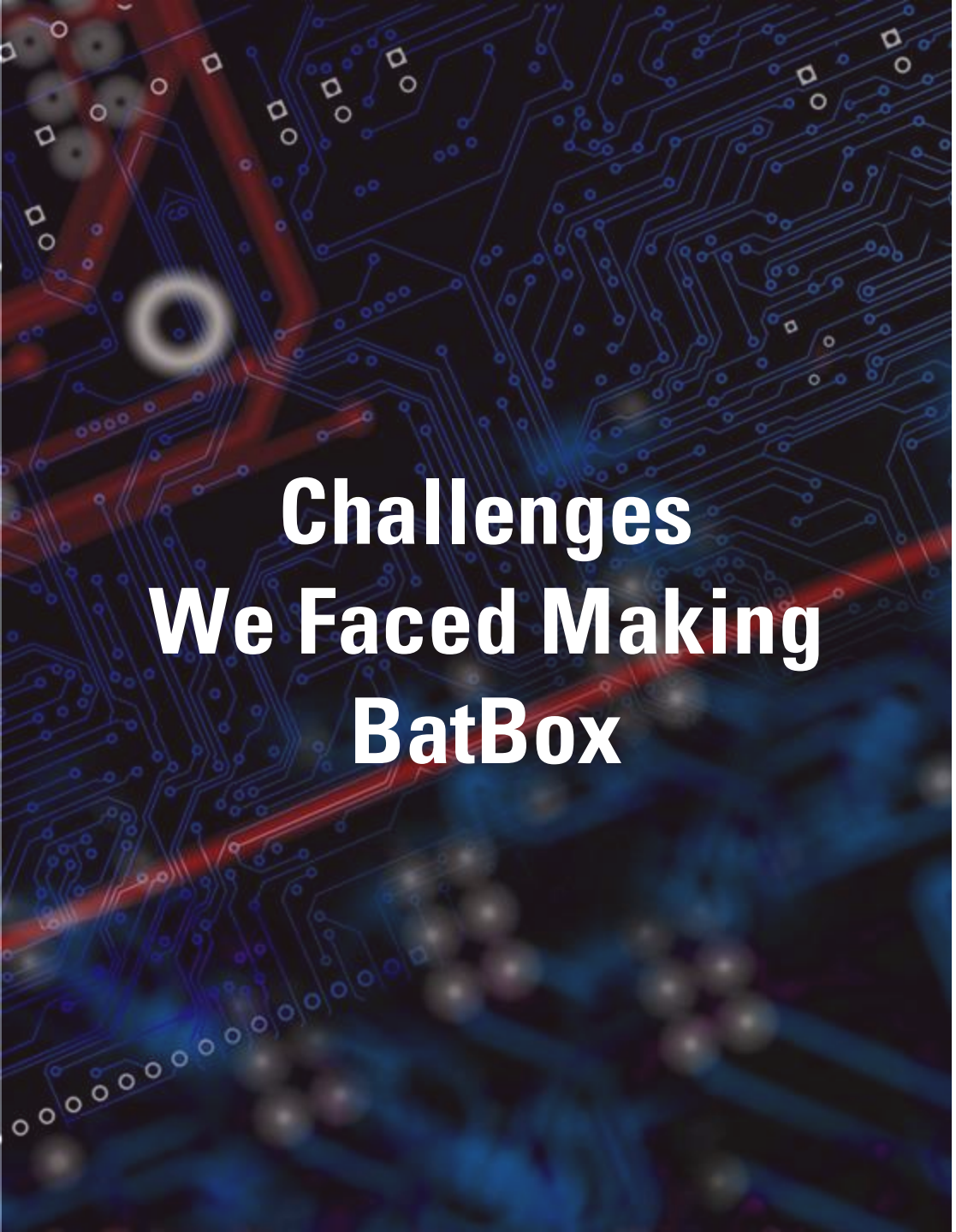
512MB Of SDRAM (Synchronous Dynamic Random-Access Memory) Main memory

2.4GHz 802.11 b/g/n wireless Lan and Bluetooth 4.2 support

T-Cobbler and Breadboard (connects everything)

Software

- Raspberry Pi OS Lite
  - Installed via microSD card using Pi imager
- Thonny IDE
  - Lightweight and beginner-friendly Python IDE that's particularly well-suited for Raspberry Pi projects. It's pre-installed on most Raspberry Pi OS versions, making it an ideal choice for programming the Raspberry Pi Zero 2 W.



Challenges We Faced Making BatBox

- **Sensor Range and Placement**
  - The US-100 sensor has a range limit and requires a clear line of sight to the object.
  - Objects outside this range or at sharp angles may not be detected accurately
- **Software Bugs**
  - Writing accurate code to measure and interpret the sensor's readings was challenging
- **Pinout Complexity**
  - Misconnections risked damaging the board. Careful referencing of GPIO pinout diagrams and testing mitigated this issue.

Challenges we faced With Our Website

- **Inconsistent Gradient Rendering Across Pages**

  •*Initially, the gradient background appeared differently on each page of the site, creating a lack of uniformity.*

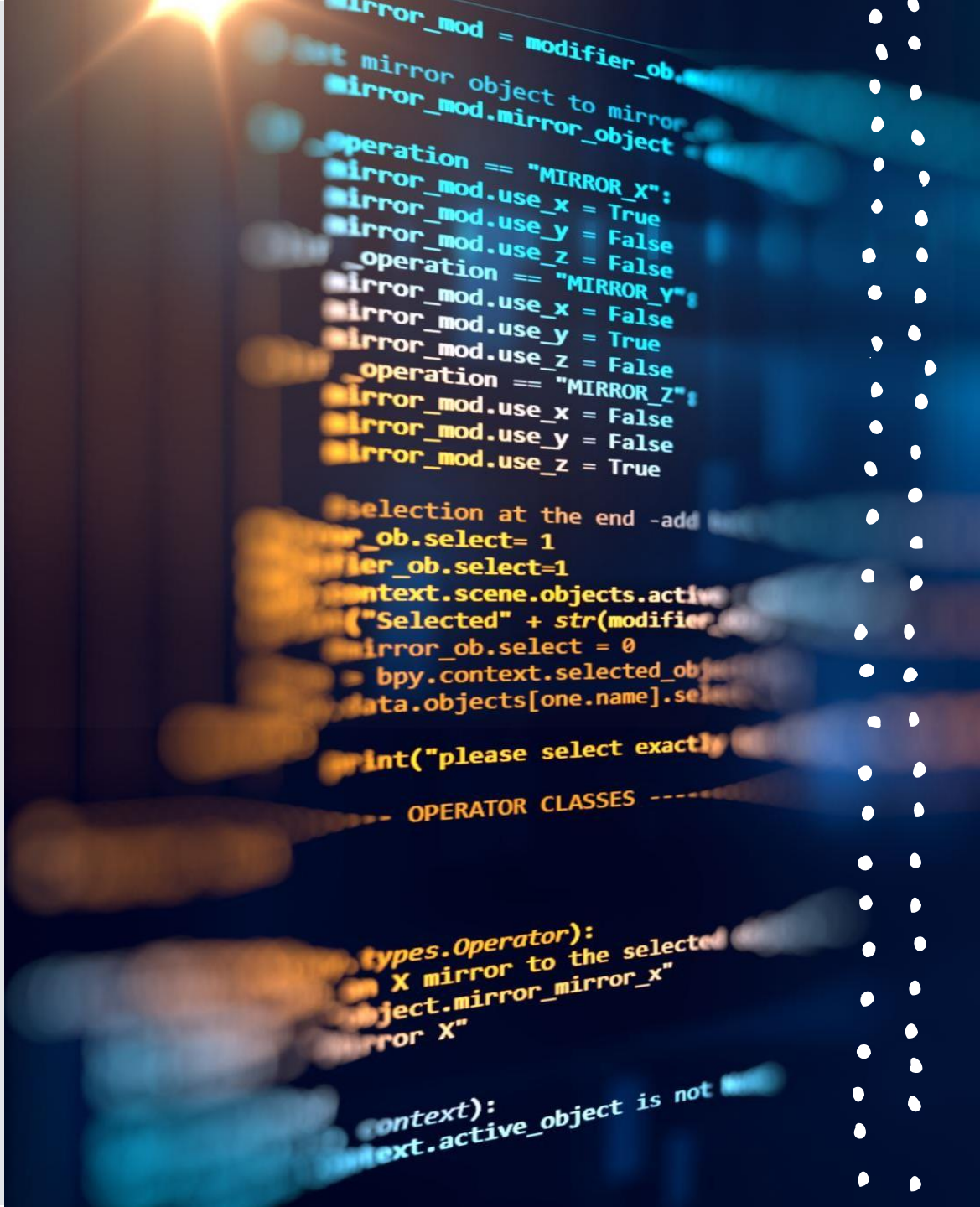
  •**Solution:** Developed page-specific CSS styles to ensure a consistent and visually appealing gradient effect across all pages.

- **Using multiple of languages for our website**
  - HTML for the website structure, CSS for styling, and JavaScript for functionality like buttons

- **Slow deployment Process**

  •*Frequent small updates to the website were met with slow deployment times, creating bottlenecks in the development workflow.*

  •**Solution:** Implemented a .nojekyll file to bypass GitHub's default Jekyll processing, improving deployment speed, though further optimization was still needed for seamless updates.



Citation

- Raspberry Pi Zero 2 W. (n.d-b) https://datasheets.raspberrypi.com/rpizero2/raspberry-pi-zero-2-w-product-
- Industries, A. (n.d.). US-100 ultrasonic distance sensor - 3Vor 5V logic. adafruit industries blog RSS. https://www.adafruit.com/product/4019