Tactile Image Display

18-549: Team 9

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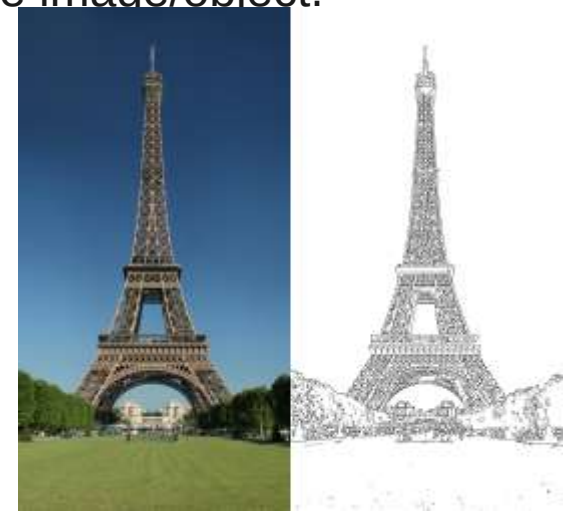
The Concept

- Reconfigurable tactile image display that aids blind people in visualization
- Edge detection will be performed on photograph, and this information will be displayed on the board.
- Simultaneously, image recognition will be done over the internet and text will be displayed in Braille to aid in recognition of the image/object.
- Paired with a smartphone app.
- Reusable.



Competitive Analysis

NIST's tactile displays

+ High resolution (60x60) refreshable tactile graphic display technology
+ Uses tiny actuators
- Large and clunky
- Expensive

Five main types of tactile displays:

1) Physical
2) Pressure
3) Vibration
4) Electric Field
5) Temperature

Requirements

- Affordable
- Reusable
- Accurate
- Readable to blind people
- Power efficient (preferably independent)

Technical Specifications

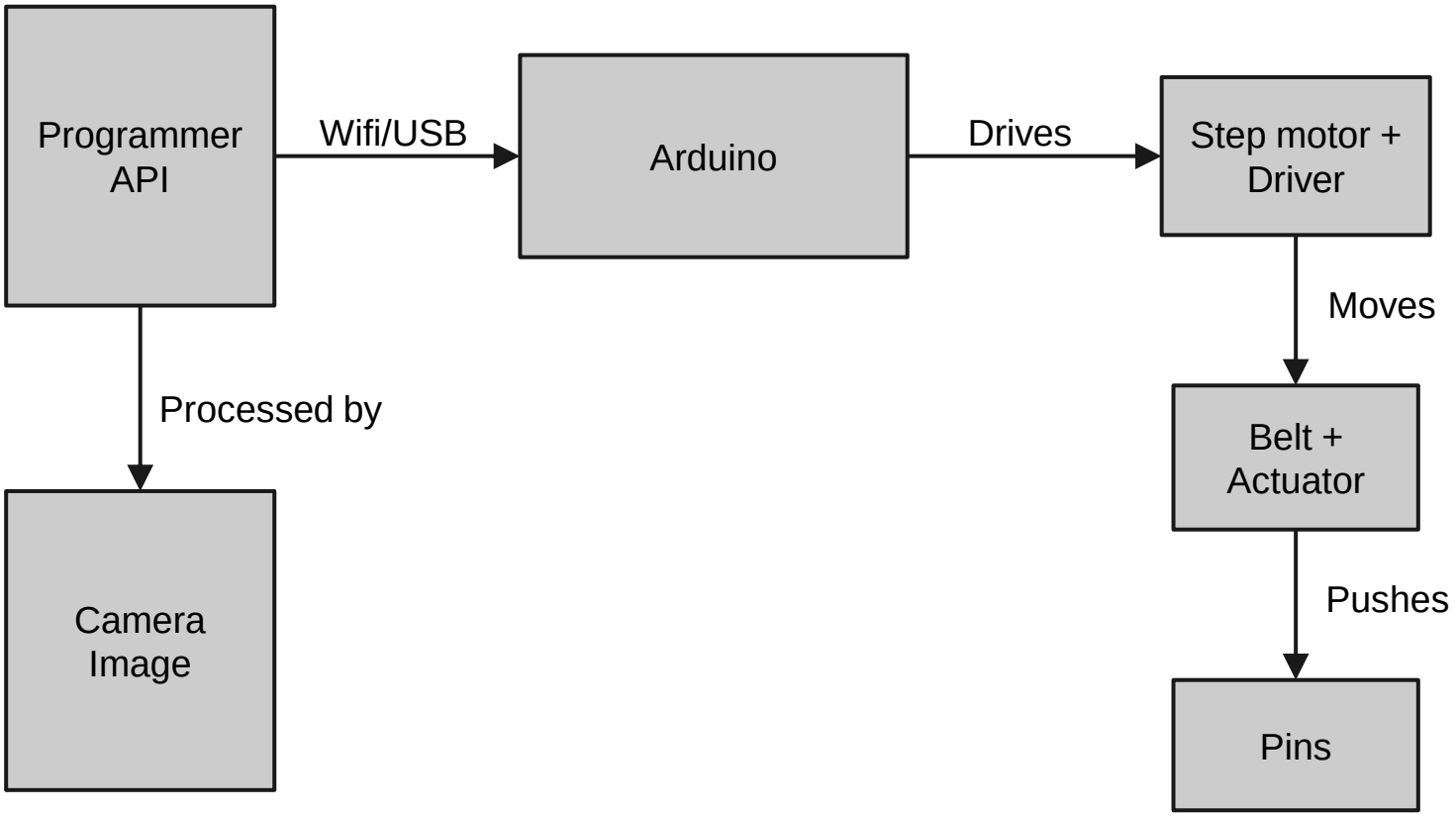
Tactile Display:

1. Step Motors
2. Step Motor Drivers
3. Arduino
4. 3D-printed pins
5. Printer belt drive system
6. Wood to mount everything

Mobile App:

1. Edge detection processing
2. Image recognition (utilize web API)

Architecture



Risk/Mitigation Strategies

- Issues with motor providing enough resolution for moving between points in NxN matrix of dots
  - use a fine-grained stepper motor(s)
- Pins may not be latched well
  - investigate different materials/shapes (pen latches)
- Visually impaired may have trouble understanding the edge information.
  - Text is important to provide additional context to the edges