mGloves

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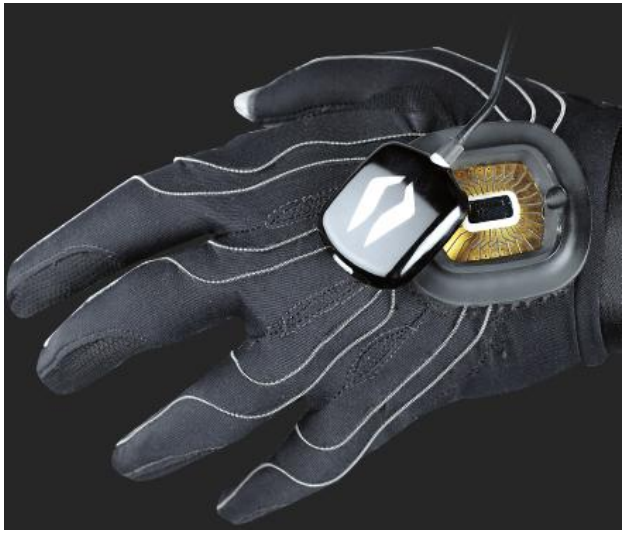
Project Concept

- Wireless gloves that allow users to interact with their computer using sophisticated hand motions
- Enable spatial manipulation of computer data, which is more natural than with traditional means

Competitive Analysis

- The Peregrine ($150)
  - Gaming glove which maps hotkeys to up to 32 gestures and motions
  - Uses thumb contact with resistive pads on fingers to determine gestures; connects with USB (wired)
- 5DT's Datagloves
  - Wired gloves start at $2,000
  - Wireless for $3,500

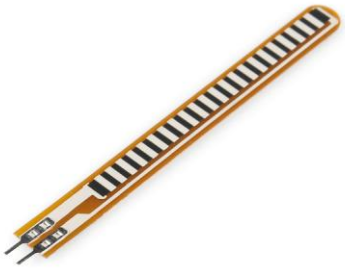


Requirements

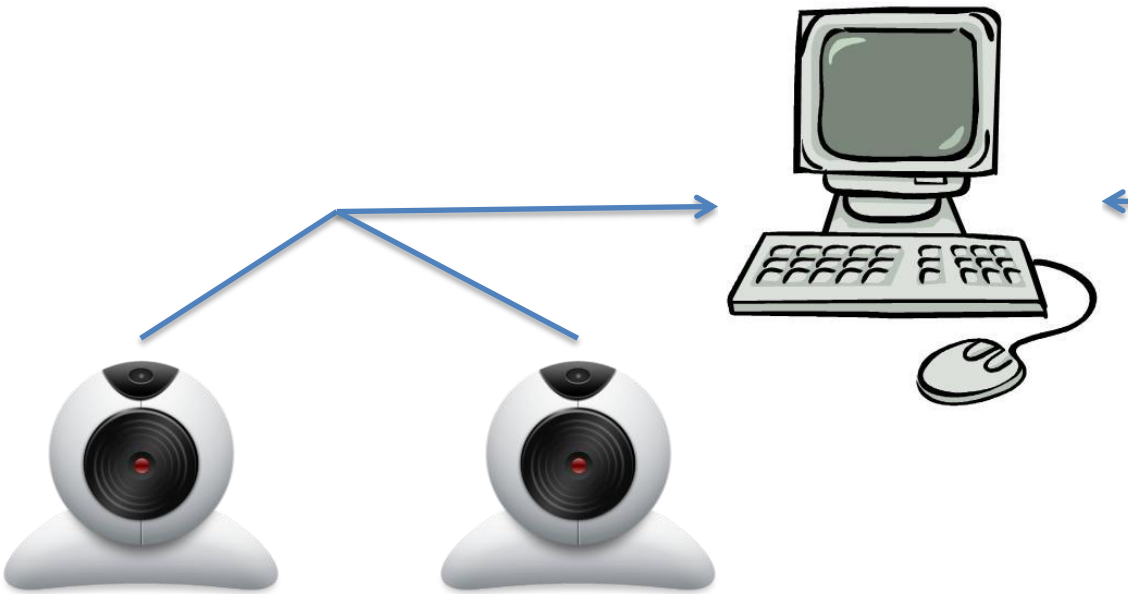
- Need to recognize motion *accurately* and *quickly*
  - Unresponsive devices are major cause of user frustration
- Gloves must be lightweight & comfortable
  - Can't restrict natural hand motions
- Diverse software integration
  - CAD, media center (image/video playback), presentation, browsing / reading
  - Provide device library for extensible use

Technical Specifications

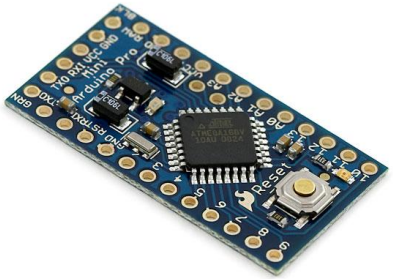
- Units needed per hand
  - Glove
  - Arduino Mini
  - Flex Sensors x7
    - 5 for fingers, 2 for wrist
  - Bluetooth Transmitter
- Webcams x2



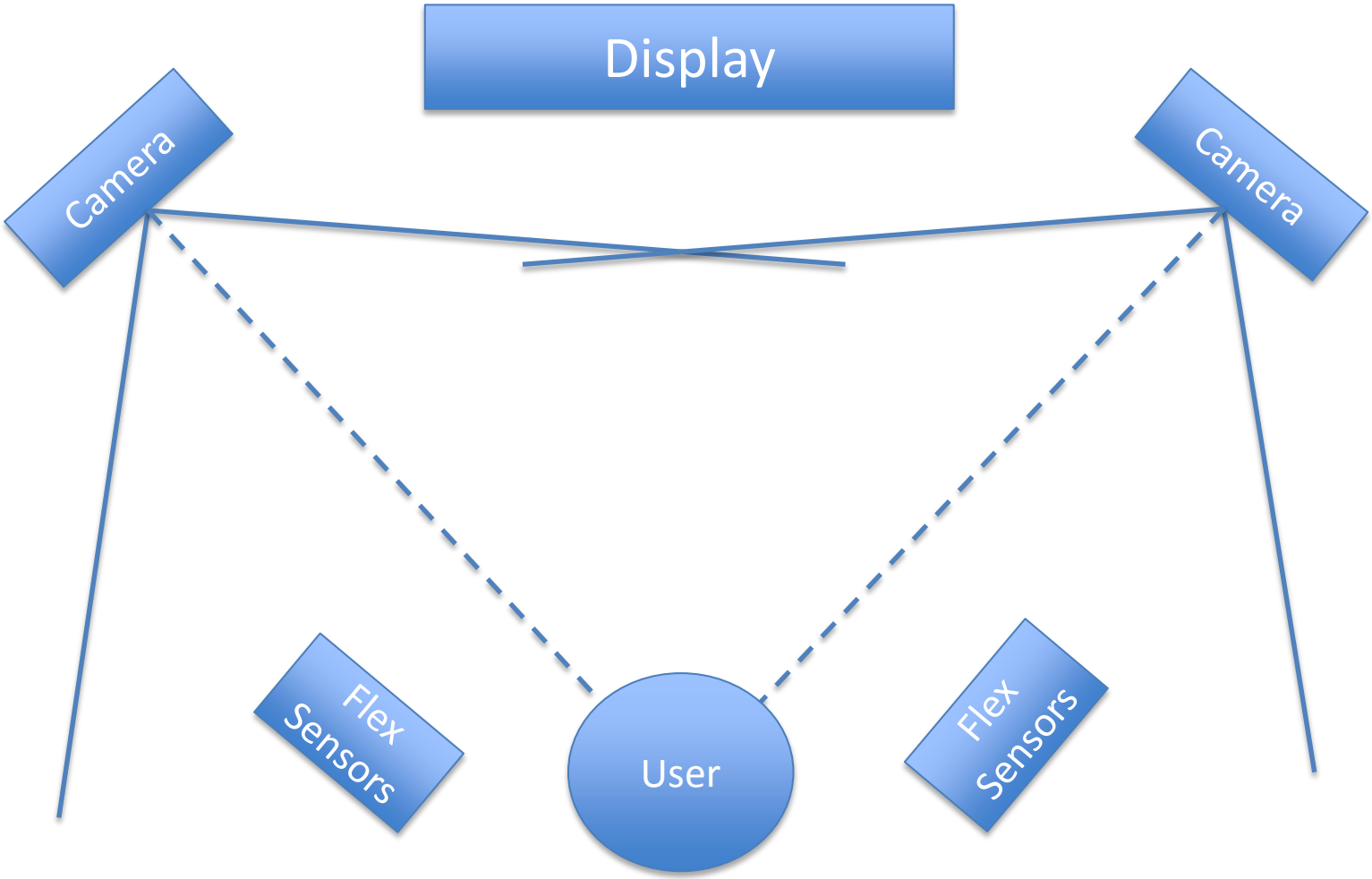
Architecture



Flex Sensors
in Gloves



Arduino Mini


Display
Camera
Camera
Flex Sensors
User
Flex Sensors

Risks and Mitigation Strategies

Risks	Mitigations
Packet loss under unreliable Bluetooth link	Implement fault-tolerant transmission protocol
Bulky gloves (housing wireless transmitter, batteries, controller) inhibits fluidity of motion by user	Move heavier components outside gloves and into a package that can either strap to your arm, or sit in your pocket
Speed loss or unresponsiveness due to overloaded data processing (from sensors on glove and cameras)	Disregard some data; choose to use strictly one source of data between sensors on glove and cameras Plan B: Wired connection to computer
OpenCV / computer vision becomes unusably difficult	-Install [IR] LEDs in glove to aid computer vision tracking / processing -Try other CV libraries / Kinect Plan B: IMU for simpler gesture processing
Integration with various software packages may be difficult due to tailoring for each specific software (i.e. SolidWorks, Photoshop, PowerPoint, Google Earth)	Focus on a few specific software package that showcase our device's capabilities

Questions?