team cARe - InTouch Health

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The Goal

- Grant Access to Quality Healthcare
  - Location
  - Size of Facility
  - Cost
- Fully Utilize Specialist's Time
- Entice and retain users
  - Important details
  - Easy and intelligent robot movement

Solution

Classification Module:

- DNN to classify personnel and objects of medical interest in a video feed
- Objects currently in mind - vitals monitors, foley bags

Robot Module:

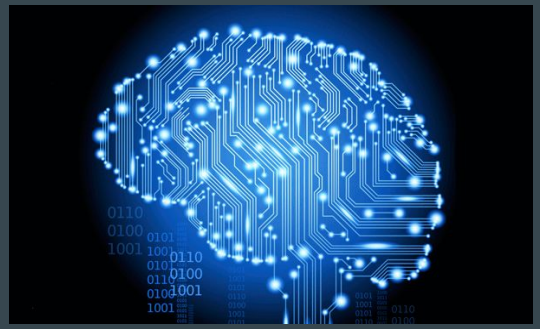
- Provides an AR overlay on original video feed and performs contextual actions
- Manipulates video frames using information from classifier

Technologies Utilized

- TensorFlow
  - Classification and object detection
- Where's the Bear
  - Creating a sufficiently large data set
- OpenCV
  - Drawing on images
- Robot API provided by InTouch
  - Building context sensitive actions
  - Camera control, movement, frame manipulation
- Pivotal Tracker for scrum management
- Slack for team communication

Current Status

Achievements:



- Trained neural net to detect object and output bounding box information
  - Retrained InceptionV3 on faces for now
  - Sliding Window classification to get localized detection
- Robot application that communicates with Robot API
  - **Frames** displayed with bounding boxes
  - **Click action**: Static drop down menu when user click on an object within the bounding box
  - **Zoom and Center methods**(unable to test on a laptop webcam, we need to test on the real robot in the future)

Challenges:

- TensorFlow - challenge with localized object detection. Sliding window is approximation, but very slow and inaccurate. (----> Explore Caffe, Microsoft Cognitive services)
- Unforeseen challenges when on the actual robot(e.g. Pixel based driving will be tricky, performing the actual zoom and center actions)

Demo

- Augmenting frames from Harry Potter
- Detected boxes displayed for each frame
- Inactive drop down menu