Anthony Lowhur

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https://github.com/vanstorm9/

Education

- **Rutgers University, New Brunswick** — **New Brunswick, New Jersey**
  Bachelors of Science in Computer Science — *September 2014 - May 2018*

- **Online Course Work** — **Coursera, Udacity edX, MIT OCW**

  Used Massive Online Open Courseware (MOOC) platforms, took higher level CS courses to aid in AI self-studies from top universities (Stanford, MIT, UC Berekley). Knowledge acquired: Techniques, math, and theory in machine learning, path finding algorithms and thought / reaction process of AI agents, reinforcement learning, and parallel programming

Research Experience

- **Rutgers University, New Brunswick** — **New Brunswick, New Jersey**
  Research Assistant — *January 2015 –*

  - Designing intelligence of a robot that will compete in the Amazon Picking Challenge through computer vision and machine learning
  - Currently researching in object detection in 3D space using depth maps produced by a Microsoft Kinect.

- **Rutgers University, New Brunswick** — **New Brunswick, New Jersey**
  Research Assistant — *September 2015 – December 2015*

  -Researched in image processing / computer vision and machine learning to have autonomous drone to analyze and recognize the shape of trash on the beach and pick them up accordingly.
  - Implemented by using histogram backprojection and morphological transform for segmentation.
  - Implemented bag of words model and support vector machines as well as creating own dataset.

- **Lehigh University** — **Bethlehem, Pennsylvania**
  Research Assistant — *May 2015 – August 2015*

  - Worked on an emotion recognition program on a robot by using computer vision and machine learning
  - Implemented dense optical flow and support vector machines to create robust classifier resistant to unique facial appearance and poort lighting
  - Research paper presented at the IEEE MASS 2015 REUNS workshop in Dallas, Texas. Publication in process.

Skills

Technical Skills

- **Programming / Scripting Languages:** *Python, Java, JavaScript, SQL, PHP, Unity3D C Sharp, MATLAB*
- **Markup Languages:** *HTML, CSS*
- **Artificial Intelligence:** *Image Processing, Computer Vision, Machine Learning (including Neural Networks), ROS + Gazebo*
- **Hardware:** *Arduino, Raspberry Pi, Leap Motion, Kinect*

Personal Programming / Hardware Projects

- **AI Melody Generator**
  - Created an algorithmic music generator that takes in a song from a midi, analyzes patterns of the musical structure, and composing its own original melodies based on the patterns it had learned.
  - Accomplished that by implementing Long Short Term Memory (LSTM) Neural Network
  - Attempting to make full AI song composer, an AI that can generate entire songs with a series melodies.
  - Currently experimenting with restricted boltzmann machines and LSTM layer.

- **Road Segmentation for Autonomous Vehicles**
  - Uses computer vision and processing algorithms such as histogram backprojection and morphological filtering in order to preform road segmentation in order to detect and recognize roads in a noisy environment.
  - Made to be implemented in the DriveAI project, an initiative for open-source autonomous vehicles. (Python)

- **Face Tracking via Haar Classification and Lucas Kanade**
  - Improved face tracking sample from OpenCV documentation by combining both Harr Classifcation and Lucas Kanade optical flow algorithm.
  - This allowed the computer to track the face/head in various different angles (front face to side face) even with limited face dataset (Python)

- **Markov Lyrics Generator**
  - Implemented markov chains on lyrics data scrapped from the web to create program that can generate its own unique set of lyrics based on genre.
  - Have the capability of creating lyrics based on syllable count per line. Part of a long term project to create a full AI song composer. (Python)

- **Kinect Helper**
  - Programmed the Kinect in order to create a workspace that is aware of the user's presence.
  - By using real-time detection, Kinect senses those who are using the computer and will automatically put the computer to sleep if the user leaves the workspace. (C++, Bash)

- **Sword Fighting Multiplayer game with Myo**
  - Created a sword fighting multiplayer game where multiple people can log into the same server and engage sword combat with each other.
  - Programmed the Myo so that users are able to preform sword attacks through sword cutting like hand gestures. (Unity3D C Sharp)

- **Force VR Gauntlet**
  - Used a motor (with rope tethered to arm) controlled by the Arduino to make a virtual reality wearable that allows the wearer to experience physical forces.
  - Whenever the user moves / swings his arm in the VR game and a hit is detected, it creates a locking effect and imitation of a physical force. Solves the issue of the lack of representation of physical forces in VR(C, Python)

- **I have more projects on my website and on GitHub. You can also see demo videos of my projects listed here on as well.**