Nina Moorman

Education

Georgia Institute of Technology **Atlanta, GA**
B.S. Computer Science (In-Progress) *August 2016 – May 2021*
Threads: Intelligence, Model Simulation *GPA 3.3*
B.S Mathematics Science (In-Progress)

Research Experience

Agile Systems Laboratory **Atlanta, GA**
Undergraduate Researcher *January 2020 – Present*
Advisor: Dr. Simon Sponberg, Georgia Institute of Technology
- Conducting research on the neuro-mechanics of *Manduca sexta* moth flight to design robo-physics models.
- Programming open and closed loop virtual environments in Unity to observe stimulus-induced *M. sexta* reactions.
- Studying *M. sexta's* electro-physiology through the electronic activity of individual wing muscles.

Streelman and McGrath Laboratory **Atlanta, GA**
Summer Undergraduate Researcher *May 2019 – August 2019*
Advisor: Dr. Johnson Zachary, Georgia Institute of Technology
- Conducted research on the gene expression patterns in Lake Malawi *Tyrannochromis cichlid* fish.
- Programmed a fish detector using animal pose estimation (DeepLabCut) to track fish movement in video data.
- Designed a fish counter that quantifies *T. cichlid* group interaction and study the mating rituals of selectively bred *T. cichlid*

Work Experience

Electronic Systems Laboratory - ELSYS **Atlanta, GA**
Software Engineer Co-Op *August 2019 – Present*
Supervisor: Austin Ruth, Georgia Tech Research Institute
Techniques and Resources: Computer Vision libraries, Machine Learning (TensorFlow, k-Means Clustering)
- Flight data processing automation for F-16 Electronic Warfare system analysis.
- Extracted system time and conducted object detection of moving symbols from video data.
- Developed a custom Fast Fourier Transform algorithm to detect system sound in noisy audio data.
- Contributed to the automation framework deployed through the distribution processing framework Apache Airflow.
- Implemented a web-based solution to data-processing architecture using SQLite3.
- Created an interactive data visualization dashboard to display artifacts.

Georgia Institute of Technology School of Computer Science **Atlanta, GA**
Head Teaching Assistant *May 2019 – August 2019*
Professor: Dr. Aibek Musaev, University of Alabama
- Designed the course's database design project for *Introduction to Database Systems (CS 4000)*.
- Held weekly office hours, formulated rubrics to evaluate project SQL queries, and graded assignments.

Skills and Other Activities

- **Programming:**
  - Advanced: Python, SQL, Html, Css, JS
  - Intermediate: Java, Matlab, D3.js
  - Beginner: C#
- **Languages:** English (fluent), French (fluent), Spanish (conversational), Japanese (conversational), ASL (beginner)

Personal Projects

Audio Semantic Analysis for Emotion Classification *May 2020*
- Analyzed audio clips of various human emotion (angry, disgust, fear, happy, neutral, sad, surprised) via Mel Frequency Cepstral Coefficients (MFCCs) which describe the overall shape of the sound.
- Programed a neural net that extracted gender and emotion from audio data. This model consisted of 8 convolutional layers with ReLU activation, batch normalization and dropout after the second and sixth convolutional layers, and 14 fully connected outputs classifying 7 emotions for 2 genders. Test set validation resulted in an emotion classification accuracy of 80% given gender, and 54% accuracy otherwise.

Animal Care Algorithms *November 2019 - Present*
- Design the workflow and manage a team in building the software and choosing the hardware necessary to track individual cows in feeding lots and diagnose them for Bovine Respiratory Disease.
- Received a patent for "BYRD" in Spring 2019