

# Majd Al Awar



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## EDUCATION

### August 2021 – Present: University of Southern California – USA

Master of Science in Electrical and Computer Engineering – Machine Learning and Data Science; GPA: 3.57/4. Expected Graduation: May 2023

### September 2015- May 2020: American University of Beirut – Lebanon

Bachelor of Engineering in Electrical and Computer Engineering [With Distinction] - Track in control and robotics; Minor in Mathematics; GPA 3.63/4.

June 2018 – August 2018: University of California, Berkeley – USA - Study abroad semester; GPA 3.85/4.

## EMPLOYMENT HISTORY

### August 2021 – Present: University of Southern California - Student Worker – Ming Hsieh ECE Department

- Research Assistant to Professor Ajitesh Srivastava & Professor Cauligi Raghavendra

**COVID-19 Scenario Projection:** Joined in strategy discussions, preprocessed the data, implemented variations of SIKJalpha, a linearized SIR model, each adapted for a certain scenario to be simulated, and carried out result analysis. Model consistently performs at the top 15% of all submissions.

**Flu-Hospitalization Forecasting:** Wrote research [paper](#) on the method used: “Random Forest of Epidemiological Models for Influenza Forecasting” which retrospectively outperformed all other submissions in terms of MAE and WIS in the 2022 FluSight challenge. Also developed an LSTM based Encoder-Decoder network which utilized an attention mechanism to leverage the seasonality of historical data. It retrospectively performed in the top 40% of submissions in terms of MAE.

- Currently implementing a Graphical Neural network to predict the transmission of Covid-19 variants between countries, and also currently researching different techniques for the Audio Classification of Covid-19 Coughs

### September 2020 – January 2022: Oreyeon LDA - Machine Learning | Computer Vision Engineer

- Trained, tested, optimized, and maintained product models which were integrated into full deployment pipelines that utilized depth cameras on edge devices capable of achieving an accuracy, over the FAA standards, of up to 95%
- Applied computer vision techniques for various image processing/postprocessing tasks to improve robustness of models.
- Maintained and optimized data pipeline using Amazon Web Services (AWS) saving both labor time and usage costs.
- Oversaw recruitment process for Machine Learning team members by representing Oreyeon in job fairs and screening/interviewing the candidates.
- Pitched and presented the product at a high-level technical perspective to prospective clients.

### September 2020 – December 2020: American University of Beirut - Part-time Research Assistant– ECE Department

- 2<sup>nd</sup> author for ICRA 2021 [publication](#): “Deep Learning and Mixed Reality to Autocomplete Teleoperation “

**Motion Primitive Classifier using Deep Learning:** Collected and preprocessed custom dataset through ROS Gazebo simulators using developed protocols. Implemented and evaluated 1D-CNN & 1D-CNN with GRUs achieving an F1-score of 90%. Devised hierarchical model to distinguish between similar motion primitives’ classifications which improved performance by 2.5%.

**Autonomous Tree Planting Drone:** Generated a dataset through a carefully constructed methodology to mimic real conditions using StyleGAN trained on real-world data. Implemented SVM, custom CNN, and VGG-16 pre-trained on ImageNet with VGG achieving the best F1-score of 88%.

### May 2019 – August 2019: Murex Systems - Software Development Internship – Information Systems & Product Management Team

Worked with data and application Integration using APIs, developed and configured needed .NET solutions, researched and got exposed to the best practices to tackle problems in software development. Project was Qlik Sense Custom Property & License Management Automation:

- Created an audit table to keep track of all changes implemented by the software through Oracle.
- Analyzed gain and coverage of the project which showed an over 50% increase in available resources, conserving both time and costs.
- Delivered presentation, demo, and final documented software to the development team

## PROJECTS

### February 2020- May 2020: NLP Offensive Content Identification in Arabizi Tweets

- Transliterated Arabic L-HSAB dataset into Arabizi by creating a rule-based converter.
- Trained, tested, and compared: Naive Bayes, BiLSTM, CNN-LSTM, & BERT models for both the Arabic/Arabizi data. CNN-LSTM outperformed the other models with an f1-score of 76%.

### December 2018 – February 2019: Engineering Design Challenge 4 (EDC 4.0) – The Road to Autonomy

Programmed a software that could handle basic everyday driving tasks of a taxi driver and designed a sturdy robot that satisfied set constraints to compete in all three games. Robot was completely autonomous and self-contained:

- Assembled Arduino, RaspberryPi, and Python to implement SSD lite mobilenet v2 (pretrained) and other computer vision techniques using tensorflow lite, opencv, and other libraries. Best Overall Design Award and 5th Place Overall

## SKILLS

**Software:** C++, C#, MATLAB, Python, Linux, Git, ROS, Postman, Java, R, SQL, Microsoft Office, AWS: SageMaker, S3, IAM, EC2, ECR, CloudWatch, Lambda.

**Machine Learning:** Classification, semantic segmentation, regression, clustering, and object detection. Frameworks: Darknet, PyTorch, Tensorflow/Keras.

**Computer Vision:** Data augmentation (weather, night, morphological), denoising, stitching, erosion/dilation, Edge detection, Hough Line transformations

## LANGUAGES

English – Native

Arabic – Full professional proficiency