SHOUMIK MAJUMDAR

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# EDUCATION

**Boston University**, Boston, MA. **Sep 2019 – Dec 2020**

MS, Computer Science. **Current GPA: 3.70**

*Selected Coursework:* Machine Learning, Image and Video Computing, Natural Language Processing, Artificial Intelligence, Object Oriented Design, Algorithms, Directed Study on Video Domain Adaptation, Graduate Networks, Robot Learning and vision for navigation.

**University of Mumbai**, Mumbai, India. **Aug 2014 - May 2018**

BE, Computer Engineering.

# TECHNICAL SKILLS

**Languages:** Python, Java, C, C++, SQL, R.

**Technologies/Platforms:** TensorFlow, PyTorch, Keras, OpenCV, Numpy, Pandas, Scikit-learn, MapReduce, Spark, Hive, HBase, Git, Docker, Flask.

# WORK EXPERIENCE

**Boston University - Graduate Research Associate. Sep 2019 – Present**

* Collected, Annotated and Filtered the first domain generalization Video dataset for action recognition curated specifically for purpose of domain generalization with Prof. Sarah Adel Bargal.
* Developed a model to align both spatial and temporal shifts across multiple domains and perform classification on videos.
* Collaborated and documented research results and findings for submission to WACV2021.

**Boston University - Department of Medicine Kolachalama Laboratory. Mar 2020 - Aug 2020**

* Engineered a bidirectional Long Short-Term Memory (LSTM) network to compute residue level and sequence level solvent accessible surface area (SASA) for an Antibody Sequences.
* Developed quantitative metrics to determine likelihood of a human body accepting an antibody.
* Evaluated obtained results against theoretical values calculated from antibody’s crystal structure.

# Genesys International Corp - Data Engineer Intern. May 2018 - Oct 2018

* Effectuated data extraction, data cleaning, data aggregation.
* Identified ways to promote data consistency, availability and partition tolerance.

# RECENT PROJECTS

**Model Based Reinforcement Learning on augmented CarRacing environment Oct 2020 - Dec 2020**

* Implemented a model-based reinforcement learning pipeline for a self-driving car on OpenAI gym’s CarRacing Environment.
* Replicated the pipeline from the “World Models” paper on an augmented version of the environment to evaluate the reliability of the perception strategy used in the original paper on complex environments.
* The above experiment highlighted the drawbacks of using reconstructions from a Variational AutoEncoders as intermediate representations of the agent’s environment.

**Chest X-Ray classification for COVID19 detection. Mar 2020 - Apr 2020**

* Designed an image classifier to perform binary classification and multi class classification to distinguish between COVID19 patients and Pneumonia patients.
* Reviewed and compared results with different model architectures such as ResNet50, VGG19, Inception- ResnetV2 and Xception pre trained on the ImageNet Dataset to determine best architecture to solve given problem.
* Model engineered outperformed 80% of compared models which provided reasonable evidence in determining best architecture to solve given problem.

**Semi Supervised Multi Source Domain Adaptation. Oct 2019 - Dec 2019**

* Devised a high accuracy model trained on multiple source domain, to classify images on an unseen target domain using domain adaptation principles.
* Utilized a Moment-Matching approach to align image features between source and target domains and explored different distance metrics to determine overall loss function.
* The above experiments resulted in a generalized deep learning architecture that solves the challenges of Domain Shift in Transfer Learning.

# MENTORSHIP AND OUTREACH

# Mentored college student trainees who participated in Affectiva’s EMPath 2020 Student Artificial Intelligence Education Program in the development of an innovative Hackathon project related to Emotion Enabled IOT, that comprised development of a smart mirror that provides support to mental health patients.