Prantik Howlader

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Education

- **Stony Brook University** — New York, USA
  Ph.D. in Computer Science and Engineering, Adviser: Dimitris Samaras — *Aug. 2018 – Present*
  - GPA: 3.65/4.0
- **National Institute of Technology** — Calicut,India
  Master of Technology in Computer Science and Engineering — *June. 2014 – June. 2016*
  - GPA: 8.67/10
- **West Bengal University of Technology** — West Bengal, India
  Bachelor of Technology in Information Technology — *Aug. 2008 – July. 2012*
  - GPA: 7.48/10

Related Coursework: Computer Vision, Machine Learning, Pattern Recognition, Natural Language Processing, Probability and Statistics
Programming Language: Python, PyTorch, TensorFlow, Java, C, C++, Perl, R, Matlab

Experience

- **StonyBrook University** — New York, USA
  Research Assistant — *Dec 2018 - Present*
  - Worked on Ultra High Resolution Pathology Images, performing segmentation and classification of tissue level necrosis and different types of cancer
- **Cisco** — Bangalore, India
  Software Engineer II — *Aug 2016 - Aug 2018*
  - Worked as a software developer and ML researcher on network content security solutions.
  - Integrated firewall and Intrusion Prevention Systems written in Perl, C++ and Java. Developed firewall essentials for policies such as BGP(Border Gateway Protocol) and Interfaces/Inline Sets.
  - Further worked on developing the REST Framework for the various policies, transferring CLI's (Command Line Interfaces) for configuring the firewall into it.
- **National Institute of Technology** — Calicut, India
  Teaching Assistant — *Aug 2015 - June 2016*
  - Graded and took lab sessions on Advanced Operating Systems and Networking.
- **Wipro** — Bangalore, India
  Project Engineer — *Dec 2012 - July 2014*
  - Worked on layer two network devices. Rack and Blade Server management, upgradation and testing in C.

Publications

- Aditya Chattopadhyay[1], Anirban Sarkar[1], Prantik Howlader[1] and Vineeth N. Balasubramanian. "Grad-CAM++: Generalized Gradient-based Visual Explanations for Deep Convolutional Networks," *IEEE Winter Conference on Applications of Computer Vision (**WACV2018**)*
- Prantik Howlader, Kuntal Kumar Pal, Alfredo Cuzzocrea, and S. D. Madhu Kumar. "Predicting Facebook-Users' Personality based on Status and Linguistic Features via Flexible Regression Analysis Techniques," *In Proceedings of ACM SAC Conference (**SAC18**)*

[1]All three authors contributed equally

- Prantik Howlader and K.S. Sudeep."Degree Centrality, Eigen vector Centrality and relation between them in Twitter," ***IEEE International Conference on Recent Trends in Electronics, Information & Communication Technology 2016***

Research Experience

- **Fine Grained Classification** — Stony Brook University, USA
  June 2019 - Present
  - We are working on CUB 200 dataset, and built a model of deep network and CAM to increase the classification accuracy of a given network such that we can take care of over representation and under representation of some classes in fine grained dataset

- **Gradient-based Visual Explanations for Deep Neural Network** — IIT Hyderabad, India
  January 2017 - October 2017
  - We worked on "explainable A.I.", i.e., making black-box deep learning more interpretable and explainable. We have proposed a model which uses softmax layer representation of an output class, to create class-discriminative saliency maps, which are back propagated to visualize those regions of the input image that led to the class label prediction by the deep network. We tested our model on CNN architectures: AlexNet, VGG16 and ResNet50. We have used the datasets: ImageNet(ILSVRC2012) and Pascal VOC 2007. This work has led to a paper that has been accepted at **IEEE WACV'18**.

- **Train Self Organising Network in wireless domain using KNN and SVM/SVR** — Cisco, India
  Oct 2016 - Aug 2018
  - Present wireless devices have a loss of more than 60% in performance when working in a highly congested environment.We are working on improving the performance of **802.11ax** networks, by using KNN and SVM/SVR to predict the load in a wireless scenario, which is used to select the most appropriate wireless allocation method. This work has been showcased to Apple and Cisco is in the process of applying a **patent** for this.

Other Notable Projects

- **Segmentation of Nuclei in Pathological Images** : Performed semantic segmentation using U-Net. Have also performed instance segmentation of Nuclei using Mask R-CNN
- **Summarization of Security Advisories in Cisco Security** : Applied Luhns Summarization algorithm with LDA to summarize and find the most important topics in the security advisories that come to Cisco.
- **Prediction of personality of users on Facebook**: We worked on predicting personality of users from their Facebook statuses. In this project, we used regression techniques like Support Vector Regression with linear, polynomial and RBF kernel along with Decision trees to predict the BIG5 personality traits of each individual based on the topics extracted from their status by LDA. We further analyzed how alpha parameter of LDA affects the prediction of the regression techniques.
- **Head pose detection using Histogram Of Gradient**: Used HOG features to classify head-pose of an individual from images and to track head position of an individual in a video. This can be used to gauge the attention of drivers in driver safety programs.
- **Centrality Concepts and influencers on Twitter** : We analyzed how Eigenvector Centrality and Degree Centrality relate to influencers in a hashtag on Twitter. We found contrary to conventional views, users with high Eigenvector Centrality need not be influential users.
- **Keyboard Dynamics based Authentication** : Analyzed the typing behavior of a user by using features like time between two key press and the key press time, to authenticate the user. Matlab and neural networks have been used to make the predictions.

Achievements

- Was selected among the top 3 in Cisco Innovation Challenge 2017.
- Secured rank 1 in Wipro programming Challenge in Bangalore, India out of 580 candidates.
- Received best performer award in Wipro PRP 2012-2013.