SHANTANU GHOSH

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OBJECTIVE *To secure a PhD position in the area of Machine Learning/Deep Learning with a focus of Causal Inference and Deep Learning*

RESEARCH INTERESTS *Deep Learning, Causal Inference, Computer Vision*

EDUCATION

University of Florida, Gainesville, FL, USA
Master of Science, Computer and Information Sciences
Advisor: Dr. Mattia Prosperi
Aug, 2019 - May, 2021 **GPA: 3.88/4**

West Bengal University of Technology, West Bengal, India
Bachelor of Technology from Institute of Engineering and Management
Computer Science and Engineering
Aug, 2008 - June, 2012 **GPA: 8.38/10**

PUBLICATION

• *Deep Propensity Network using a Sparse Autoencoder for Estimation of Treatment Effects* - **Shantanu Ghosh**, Jiang Bian, Yi Guo, Mattia Prosperi. Journal of the American Medical Informatics Association (JAMIA) **(Under review)**

• *Causal AI with Real World Data: Do Statins Protect From Alzheimer's Disease Onset?* - Mattia Prosperi, **Shantanu Ghosh**, Zhaoyi Chen, Marco Salemi, Tianchen Lyu, Jiang Bian. American Medical Informatics Association (AMIA), 2021 **(Under review)**

• *Propensity Score Synthetic Augmentation Matching using Generative Adversarial Networks (PSSAM-GAN)* - **Shantanu Ghosh**, Jiang Bian, Mattia Prosperi. Thirty-Fifth AAAI Conference on Artificial Intelligence **(Under review)**

RESEARCH EXPERIENCE

Data Intelligence Systems Lab (DISL), Gainesville, FL, USA
Graduate Student Assistant ***March 2020 - Present***
Advisor: Dr. Mattia Prosperi, Dr. Jiang Bian, Dr. Yi Guo

• Currently working on to improve PSSAM-GAN framework by incorporating Adverserial Autoencoder and InfoGAN.

• Using Pytorch, reproduced the model DCN-PD proposed in the paper [**Paper**](*ICML 2017 - Workshop on Principled Approaches to Deep Learning*), that has been utilized in the research study whether usage of Statins is useful toward the onset of Alzheimer disease. Paper is under review at ***AMIA, 2021***. [**Code**]

• Developed Deep Propensity Network - Sparse Autoencoder(**DPN-SA**) - a sparse auto encoder based neural network model to calculate propensity score, outperformed logistic regression and LASSO by **36-63%**, and DCN-PD (baseline models) by **6-10%** across all datasets. Paper is under review at ***JAMIA***. [**Code**]

• Developed Propensity Score Synthetic Augmentation Matching using Generative Adversarial Networks (**PSSAM-GAN**) - an algorithm to generate synthetic treated samples to remove imbalance within a observational dataset for Propensity score matching (PSM). The model improved the performance by **38%** and **5%** over DCN-PD and TARNET(baseline models) respectively. Paper is under review at ***AAAI, 2021***. [**Code**]

Multimedia Communications and Networking Laboratory (MCN), Gainesville, FL, USA
Independent Researcher ***Feb 2020 - May 2020***

Advisor: Dr. Dapeng (Oliver) Wu
Developed a Deep Convolutional Multitask Neural Network(**MTL-TCNN**) to classify textures under the supervision of Dr Prof Dapeng Oliver Wu of the Department of Electrical & Computer Engineering in the University of Florida. [**Report**] [**Code**]

PROFESSIONAL EXPERIENCE

Lexmark International India Pvt Ltd, Kolkata, West Bengal, India
Software Engineering Professional II ***Oct 2016 - July 2019***
Developed the ISP component of the product Publishing Platform for Retail(PPR) with active participation in 2 major releases. Also, worked on Lexmark Digital Media Platform, a multi-tenant enterprise video content management platform hosted in Amazon Web Services.

Cognizant Technology Solutions India Pvt Ltd, Kolkata, West Bengal, India
Associate, Projects ***March 2013 - September 2016***
Developed WCF web services in the Contract First Approach to provide secure communication between different In-house application using Service Oriented Architecture (SOA), C# .Net 4.5, Oracle Client 11g. Trained C# to new recruits in Cognizant Academy.

COURSE PROJECTS

Classification of Handwritten Characters **Oct 2019 - Dec 2019**
Fundamentals of Machine Learning, **University of Florida, FL, USA**

Inspired by the famous architecture **"Lenet-5"**, developed a deep CNN model to classify Handwritten Characters using a custom Handwritten Character Dataset prepared by Prof Alina Zare by utilizing the Adam Optimizer, Batch Normalization and dropout and achieved a classification accuracy of **97.3%** on a customised data set prepared by Prof Zare [**Code**]

- **Technology/Tools:** Python, Pytorch, Sckit-learn

Implementation of P2P network **Nov 2019 - Dec 2019**
Computer Networks, **University of Florida, FL, USA**

Created a peer-to-peer(P2P) network for file downloading. Developed components – peer and file owner. The file owner has a file, and breaks the file into chunks of 100KB. Each peer connects to the file owner to download some chunks with the help of two threads, one acting as a server that uploads the local chunks to another peer (referred to as upload neighbor), and the other acting as a client that downloads chunks from a third peer (referred to as download neighbor). Tested the code with max **5** peers and max file size of **13.3 MB**. [**Code**]

- **Technology/Tools:** Socket Programming, Java

Dataset augmentation using InfoGAN and ConditionalGAN **Oct 2020 - present**
Deep Learning for Computer Graphics, **University of Florida, FL, USA**

Currently implementing MNIST and CIFAR10 dataset augmentation using InfoGAN and ConditionalGAN to improve the classification accuracy of an image classifier.

- **Technology/Tools:** Python, Pytorch, Sckit-Learn

Comparative study of the performance of VAE and GAN **Oct 2020 - present**
Machine Learning, **University of Florida, FL, USA**

Currently working to prepare a comparative study of the performance of VAE and GAN on MNIST and CIFAR10 dataset.

- **Technology/Tools:** Python, Pytorch, Sckit-Learn

TECHNICAL SKILLS

Languages : Python, C++, C, Java, C#, Javascript/Typescript
Database : MySQL, Oracle 9i/10g, MS SQL Server, DB2

Web Development : Angular, Node.js, WCF
Machine Learning : TensorFlow, PyTorch, Scikit-learn

GRADUATE COURSES

• Fundamentals of Machine Learning • Distributed Operating Systems • Computer Networks • Mathematics for Intelligent Systems • Advanced Data Structures • Machine Learning • Deep Learning Computer Graphics • Fundamentals of Probability • Analysis of Algorithm (Spring 2021)

ACHIEVEMENTS.

• Recipient of **National Scholarship** Award from **Central Government Human Resource Development Department of Higher Education, India** for excellent result in Higher Secondary Examination in the state of West Bengal, India.
• Topped with **1%** of all candidates appeared in **West Bengal Joint Entrance Examination** in 2008.
• Received **Star Employee** award in Q4, 2013 and Q4, 2015 in Cognizant Technology Solutions.
• Received **Achievement Award** of 4500 USD during the admission of graduate studies in the University of Florida in Fall 2019.