Muhammad **Shayan**

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Education

University of British Columbia (UBC)   *Vancouver, Canada*

MS COMPUTER SCIENCE => GPA:84/100 (FIRST CLASS STANDING)   *Jan. 2018 - Exp. Dec 2019*

Lahore University of Management Sciences (LUMS)   *Lahore, Pakistan*

BS COMPUTER SCIENCE | MINOR IN MATHEMATICS => GPA:3.63/4.0 (GRADUATION WITH DISTINCTION)   *Sep. 2013 - May 2017*

Work Experience

University of British Columbia   *Vancouver, Canada*

GRADUATE RESEARCH ASSISTANT   *Jan. 2018 - PRESENT*

- Enabled collaborative peer to peer training of machine learning models from decentralized data by building a blockchain-based system in Go
- System is able to protect privacy of a peer's data using differential privacy/secure multi-party techniques while defending against poisoning attacks from an adversary controlling 45% of the nodes.
- Work presented as a poster at NSDI'19

Microsoft Research   *Beijing, China*

RESEARCH INTERN   *July. 2019 - Sept. 2019*

- **Project:** Accelerating Trusted Execution of ML Inference via Selective Parameter Sharing **Mentor**: Xian Zhang

IBM   *Karachi, Pakistan*

COGNITIVE ANALYTICS INTERN / DATA SCIENTIST   *July. 2017 - Dec. 2017*

- Identified prospective customers for targeted marketing of a client's products based on psychographic segmentation of customer personalities using social media data.
- Build a data centre consolidation strategy for sites running CATIA to cut maintenance costs while maintaining SLA latency requirements. Built a stress testing strategy to measure effect of consolidation on users using Apache JMeter
- Developed a proof of concept to cut down on repetitive queries in customer calls by developing an Android-based chat bot for an airline.

Software Engineering Research Lab - LUMS   *Lahore, Pakistan*

RESEARCH INTERN   *June 2016 - Aug 2016*

- Helped developers retrieve quality, reusable code from open source repositories by building an information retrieval system in Java
- The system retrieved relevant and reusable code from open-source repositories that adhered to standard design pattern practices with a mean average precision of 64 %
- Work published at the Asia Pacific Software Engineering Conference '16

Data Communication and Control (Pvt) Ltd   *Karachi, Pakistan*

SOFTWARE ENGINEERING INTERN   *Jun 15 - Aug 15*

- Developed the authentication scheme for an Electronic Warfare Training simulator for training new recruits in Pakistan Navy.
- Enabled cloud integration of the native C++ application with the Moodle Learning Management System using SOAP web services.

Lahore University of Management Sciences/University of British Columbia   *Lahore/Vancouver*

TEACHING ASSISTANT   *Sept 16 – May 17/ Jan'18-Dec'18*

- **Courses Taught:** Computer Networks, Data Mining, Databases, Algorithms
- Leading weekly tutorials that required walking a class of 30 undergraduates through coding exercises.

Publications

Biscotti - A Ledger for Private and Secure Peer to Peer Machine Learning [paper][code]

MUHAMMAD SHAYAN, CLEMENT FUNG, CHRIS JM YOON, IVAN BESCHASTNIKH, POSTER AT NSDI 19, BOSTON MA

Retreiving Design Pattern Usage Examples Using Domain Matching [paper][code]

SHAMSA ABID , ZOHAA QAMAR , NATASHA KHAN , MUHAMMAD SHAYAN , HAMID ABDUL BASIT

Projects

LeyLine Routing Protocol for IOT devices[code]

- Devised/implemented a routing protocol that conserves memory by requiring nodes to store a constant amount of entries in their routing table and conserves energy by using shortcut entries to reduce the routing stretch from O(n).

Football Analytics [code]

- Trained a shot-prediction model using empirical Bayesian Estimation of shooting effectiveness and strategic features from spatiotemporaldata.

Doco: Automatic generation of documentation from source code[code]
- Generated with a 47% success-rate, automatic documentation for Google's Guava library in Java, by developing an Atom plugin that performs static and dynamic analysis of source code to infer useful pre and post conditions of each function.

Emotion style transfer on tweets[code]
- Achieved style transfer accuracy of 81% on rewriting tweets to express different emotions by training a Generative Adversarial Network (GAN) from latent representations obtained from machine translation models.

Detecting Adversarial Attacks on Facial Recognition Systems[code]
- Separated out honest examples from malicious examples (adversarial attack and backdoor attacks) at inference time for VGG-Face using dimensionality reduction and activation clustering.

Honors, Awards & Certifications

2014-2017 **Dean's Honour List**, Lahore University of Management Sciences

2016 **Awardee - Summer Research Program**, Lahore University of Management Sciences

2010 **Winner**, SZABIST Website Design Competition

2015 **Ericsson ICT Professional Foundation Program 2015**, Certification to bridge the knowledge gap of recent graduates with Ericsson's products

2017 **IBM certifications**, IBM Watson Conversation Methodology, IBM Node RED: Basics to Bots, IBM Hadoop 101

Skills

High Level: Distributed Systems, Machine Learning, Privacy/Security in AI
Languages: Python, Go, MATLAB, SQL, JavaScript, Java, C++
Libraries/Software: PyTorch, Theano, RapidMiner, WEKA, Proteus ISIS , PTC Creo, TOSSIM, Cooja, SPSS Modeler