Muhammad Usama Saleem

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Research Interests

Internet Measurements, Networks, Security, Privacy, Systems, Machine Learning and Data Mining

Education

Lahore University Of Management Sciences   Sept. 2017 – May 2021(Expected)
Bachelors in Computer Science(LUMS)
Relevant coursework

- Networks Security, Network Centric Computing, Advanced Programming, Operating System, Software Engineering, Human Computer Interaction, Algorithms, Applied Probability, Deep Learning, Machine Learning, Computer Vision, Data Mining, Big Data Analytics

Experience

Research Assistant   August 2020 – Present
Lahore University Of Management Sciences(LUMS)
Project on investigating the compliance with COPPA in browser-based games

- Investigated the compliance of gaming websites with COPPA at the Technology for People Initiative (TPI) lab with Dr.Fareed Zaffar(LUMS)
- Observed the type of ads being shown to personas of children contained pornographic material and websites are collecting personally identifiable information (PII) like a user's IP addresses which they are utilizing for targeted advertising on children
- Used burpsuit, and selenium library to collect cookies, responses and requests of website
- Plan to develop a program for web-based games that keeps an automated check system

Research Assistant
Lahore University Of Management Sciences(LUMS)
Project on counter deepfake misinformation among the low digital literacy population

- Study focused on minimizing the spread of misinformation in low digital-literacy population by countering deepfakes with Dr.Agha Ali Raza(LUMS) at the Center for Speech and Language Technologies (CSaLT)
- Investigated factors influencing belief formation in illiterate people when they are exposed to deepfake audio and video clips
- Generated Urdu transcriptions by using our Kali-Urdu speech recognition model
- Designed text-to-speech systems for generating fake audios of politicians and journalists
- Solved the lack of computational resources by shifting towards real voice cloning
- Used PyTorch and Tensorflow to built deep learning based models

Co-Researcher   Jan 2020 – May 2020
Lahore University Of Management Sciences(LUMS)
Project on recommender system based on enhanced ripple-net algorithm

- Improved a recommender system by combing the knowledge of collaborative filtering and knowledge graph advised by Dr.Imdadullah Khan(LUMS) at Data Analytics Lab
- Performed literature review for finding the automatically meta-paths on knowledge graph
- Introduced non-uniform sampling, and explored more in depth effective rated items that increased 3.0% accuracy and AUC over an existing state of the art method
- Used tensorflow and pytorch for implemention
- Evaluated model performance on MovieLens1M and Book-Crossing dataset

Teaching Assistant
Lahore University Of Management Sciences(LUMS)

- Worked as a teaching assistant for graduate courses including Deep Learning, Machine Learning, Data Science and Speech Processing

Projects

Undergraduate Research Thesis   Sept. 2020 – Present

Project on Classification, and Evasion of Encrypted Traffic Fingerprinting

- Designed a system for real-time android apps classification by fingerprinting the encrypted network traffic under the supervision of Dr.Fareed Zaffar(LUMS)
- Discovered vulnerabilities in existing techniques with an extensive literature review
- Incorporated differentiating features to capture the overall distribution from different angles of same app
- Implemented several Transformer models in PyTorch and Tensorflow for experimental replication
- Designing robust defenses by obfuscation of network traffic so adversaries cannot fingerprint apps
- Plan to work on fingerprint applications on smartphones in one go as well as using a semi-supervised approach to classify unseen apps

Technical Skills

Languages: Python, C/C++, Haskell, R, GoLang, Vue.js, Node.js , SQL, HTML/CSS
Tools: Burpsuit, Frida, Git, VS Code, Visual Studio, PyCharm, Adobe Xd
Libraries: Pandas, Selenium, NumPy, Matplotlib, Open-CV, Selenium, NLTK, Scikit-learn, Tensorflow, Pytorch

Awards & Honors

- Dean's Honor Roll from 2019-2020
- Robotic Winner in LUMS
- PKR 3.0 Million Scholarship from LUMS
- Academic Scholarship in A-levels