M. Hammad Mazhar

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Research Interests

Smart Home IoT, Security, Privacy, Machine Learning

Education

2016–present	**Ph.D. in Computer Science** Department of Computer Science, The University of Iowa
2012–2016	**B.S. in Computer Science** Lahore University of Management Sciences, Pakistan

Professional Experience

2019	**Security Research Intern** Minim Inc., Manchester, NH
2016–present	**Graduate Research Assistant** Department of Computer Science, The University of Iowa
2018	**Teaching Assistant** Department of Computer Science, The University of Iowa
2014–2016	**Research Assistant** Department of Computer Science, Lahore University of Management Sciences
2014–2016	**Teaching Assistant** Department of Computer Science, Lahore University of Management Sciences

Publications

IoTDI   **Characterizing Smart Home IoT Traffic in the Wild**
M. Hammad Mazhar, Zubair Shafiq
To appear in ACM/IEEE Internet of Things Design and Implementation, Sydney, Australia, 2020
Acceptance rate: 24/68=35%

INFOCOM   **Real Time Video Quality of Experience Monitoring for HTTPS and QUIC**
M. Hammad Mazhar, Zubair Shafiq
IEEE International Conference on Computer Communications, Honolulu, 2018
Acceptance rate: 309/1,606=19%

Research Projects

Smart Home IoT   **Studying Smart Home IoT in the Wild**
External Collaborators: Minim
- Smart home IoT devices have become pervasive, but little is known about their network traffic characteristics in the wild.
- We instrument and deploy home gateways to collect flow-level information for connected devices.
- Our study shows that IoT devices exhibit network traffic characteristics unique from non-IoT devices, and have connectivity patterns based on their intended purposes.

This project has been accepted to appear at ACM/IEEE IoTDI 2020.

Video QoE RCA	**Root Cause Analysis of Video QoE impairments using cellular link-layer characteristics**
	External Collaborators: Nokia Networks
	○ Cellular network operators currently diagnose root causes of video QoE impairments using ad-hoc and manual analysis.
	○ We proposed a machine-learning based approach to root cause analysis leveraging fine-grained RAN and CN performance characteristics.
	○ Our approach found factors such as cellular load and radio channel conditions to induce video QoE impairments in an operational cellular network.
Video QoE Monitoring	**Monitoring Video QoE for Encrypted Traffic in Real-Time**
	External Collaborators: Futurewei Technologies
	○ End-to-end encryption protocols such as HTTPS and QUIC have reduced visibility of network operators into video QoE metrics.
	○ We proposed a machine-learning based approach to monitor video QoE metrics for encrypted video traffic.
	○ Our approach is capable of monitoring video QoE metrics on 10-second timescales to improve network operator reactiveness to video QoE impairments.
	Published in IEEE INFOCOM'18

Honors and Awards

2018	**Best-in-Session Presentation Award**, IEEE INFOCOM
2018	**Student Travel Awards**, ACM IMC
2017	**Student Travel Awards**, ACM SIGMETRICS, PETS

Services

Technical Program Committee Member	12th EAI International Conference on e-Infrastructure and e-Services for Developing Countries - *EAI AFRICOMM 2020*
External Reviewer	Network Traffic Measurement and Analysis - *TMA 2019*
Shadow PC Member	ACM Internet Measuremnet Conference - *IMC, 2018*

Skills & Expertise

Programming Languages	Python, MySQL, Matlab, C++, Java, HTML, CSS, LATEX.
Tools & Frameworks	Weka, Tensorflow, Keras, Scikit-Learn, Wireshark.
Operating Systems	Linux, Mac, Windows

References

Prof. Zubair Shafiq	Assistant Professor, Department of Computer Science, The University of Iowa.
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Matteo Varvello	Performance Researcher, Brave Software.
	varvello@brave.com
Sam Stelfox	Security Engineer, Minim Inc.
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