Bilal Karim Mughal

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Education

Isra University (2009 – 2013)
BS in Telecommunication, CGPA: 3.62/4.00 (Silver Medal, 2nd Position in Department of Electrical Engineering and Computer Science)

Dr. N.A Baloch Model College (2007 – 2009)
Higher Secondary School, Grade: A

Employment

Dawn Media Group (Nationwide English Daily) – *Translator (Aug 2014 – Present)*

- Translating news, articles, and blogs from Urdu to English for http://www.dawn.com.
- Making news stories, editing blogs.

Isra University – *Teaching Assistant (Fall 2013)*

- TCCC 223 – Computer Communication and Networks.
- Responsibilities included holding discussion sessions, and helping with grading.

Pakistan International Airlines, Karachi – *Intern (Summer 2013)*

- CCNA training classes.
- Obtained hands-on experience of configuring Cisco routers and switches and see usage of some Openflow applications.
- Traffic analysis.

Daily Regional Times of Sindh (Local English Daily) – *Sub-Editor (Oct 2011 – Jul 2014)*

- Translating news reports from Sindhi and Urdu languages to English.
- Editing of English news articles.

Pakistan Broadcasting Corporation (Radio Pakistan) – *Translator (Aug 2010 – Mar 2011)*

- Translating news from English to Urdu.

Skills

Networking – Various simulators and emulators like Cisco Packet Tracer and Emulab testbed, configuration of Interior Routing protocols, IP addressing and subnetting, VLANS and VTP, ACLs, Frame Relay, STP, etc. Experience with software defined networking using Openflow-enabled hardware. Tools like Wireshark, iperf, tcpdump, etc.

Languages – Java, C++, Python (IDEs including Netbeans and Eclipse)
Others – MS Office, SPSS (Statistical Analysis Package), MATLAB, Electronics Workbench, etc. Familiar with Linux/UNIX. Proficient drafter and language translator (English-Sindhi-Urdu languages).

Projects and Research

Designed AB-AODV, a wireless routing protocol based on AODV – *Final Year Project*
Optimized Ad Hoc On-Demand Distance Vector (AODV) routing protocol for MANETs to reduce message flooding and solve scalability problem found in current protocols. Coded as a module for SWANS++ simulator. Reduced flooding by multiple orders of magnitude, thereby allowing better scalability in terms of both node density and message sending rate.

Automated traffic shaping based on IP traffic analysis using SDN – *Class Project*
In a small Emulab testbed setup, implemented a centralized Openflow controller to dynamically configure routers' QoS parameters, doing rate limiting and bandwidth allocation based on the type of traffic going through the router.

Efficient peer-to-peer open file stream distribution – *Independent Team Project*
Devised a scheme for live file stream distributions over peer-to-peer networks by modifying BitTorrent protocol and using public key cryptography to maintain file integrity. Use cases of new scheme include anything from distributing log structured storage or arbitrary pure functional data structures to P2P OS package updates and live video streaming.

Disaster recovery plan for an IT firm - *Class Project*
Investigated the ways an IT firm can suffer in case the network operations center is hit by a man-made or natural calamity. Created an emergency response and backup plan for immediate resuming of IT operations.

Exploring vulnerabilities in cloud network environment – *Team Project*
Explored the possibility of attackers being able to pinpoint the location of the victim's machine within a cloud network and then mount side-channel attacks. Implemented a small cloud in Emulab testbed and found out that the vulnerabilities still exist in current framework and my results match with published research.

Designed transmitter and receiver for optical fiber communication – *Class Project*
Built circuits for transmission of Morse Code via Optical Fiber

OpenFlow random host mutation (OF-RHM) – *Class Project*
Implemented OF-RHM technique from the literature which combines software defined networking and concept of moving target defense (dynamic assignments of virtual IPs while the real IPs stay hidden) to provide network nodes with a defense mechanism against IP scanning-based attacks and worm propagation.

Investigated usage of social networking sites in education – *Team Leader*
Conducted surveys, measuring metrics related to social networking usage by students, learnt survey design and various statistical analysis techniques. The results were to inform later stages of the main project.

Publications and Articles

Mughal, B.K., Syed, A., Khan, A. (2014). "Information Leakage in the Cloud"; In Proceedings of the 8th IEEE International Conference on Open Source Systems and Technologies, UET Pakistan, Lahore. (In Press)

Syed, A., Mughal, B.K., Khowaja, K., Ansari, M.S. (2012). "Social Networking in Education"; Presented at Isra University Research Paper Competition, Hyderabad, Pakistan. (Received First Prize)

Mughal, B.K., Syed, A. (2014) Open-Ended BitTorrent: Efficient Peer to Peer Open File Stream Distribution (work in progress, draft accessible on website)

Mughal, B.K., (2013) State of the Art in Software Defined Networking – Lessons Learned and the Way Forward. (Article, draft accessible on website)

Honors and Awards

Silver Medal, Dept. of Electrical Engineering and Computer Science, *Isra University (2013)*
Awarded for receiving 2nd position among the Class of 2013.

First Prize, iCube Network Designing Competition, *Isra University (2013)*
Theoretical round+Network designing in Cisco Packet Tracer+Hardware implementation

First Prize, Tech-Combat Computer Networking Competition, *Mehran University (2012)*
Theoretical round+Network designing in Cisco Packet Tracer+Hardware implementation

First Prize, Research Paper Competition, *Isra University (2012)*
Awarded for research paper titled 'Social Networking in Education'.

Isra Tuition Waiver, *Isra University (2009-2013)*
75% tuition fee waiver; award renewed in all semesters throughout the undergraduate program for maintaining good academic and disciplinary performance.

Extracurricular Work

Isra University Newsletter – *Assistant Editor (Mar 2013 – Dec 2013)*
For the official newsletter of Isra University, titled Isra News.

Isra University Science Society – *President (Dec 2012 – Dec 2013)*
Committee for science promotion and popularization; organized science exhibition in the university.

Hyderabad Astronomers Society – *Founding Member and President (Since 2011)*
Founded with fellow enthusiasts; regularly organize star parties at Isra university and other educational institutes for both students and general public.

Isra University Youth Development Forum - *Member (Dec 2012 – Jan 2014)*
Organized debate/speech competitions at university.