Nauman Shahid

Department of Computer Engineering
College of Electrical and Mechanical Engineering
National University of Sciences and Technology
Islamabad, Pakistan

Phone: +92 314 4086199
Email: naumanshahid@msn.com
LinkedIn: https://pk.linkedin.com/in/snaumanshahid
Website: https://naumanshahid.github.com

Research Interests

Computer Architecture, Reconfigurable Computing, High Level Synthesis, Signal Processing, System on a chip, Network Paradigms, Embedded Software, Nanofabrication

Education

Bachelor of Engineering with majors in Computer Engineering — 2014
College of Electrical and Mechanical Engineering
National University of Sciences and Technology, Islamabad, Pakistan
CGPA: 3.68/4.00 | Major GPA: 3.79/4.00 | Senior Year CGPA: 4.00/4.00
Senior Year Thesis: An FPGA based approach to deep packet inspection for the purpose of application aware routing in multi-gigabit content-delivery networks

University of Cambridge International Examinations GCE A-Levels — 2010
St. Anthony's College, Lawrence Road, Lahore, Pakistan
Pre-Engineering: A*AAA (Gold Medal)

University of Cambridge International Examinations GCE O-Levels — 2008
St. Anthony's College, Lawrence Road, Lahore, Pakistan
Sciences: 5A 3B

Professional Experience

Associate Engineer — August 2014 - To date
u-blox Lahore Pakistan Pvt. Ltd. (A subsidiary of u-blox AG, Thalwil, Switzerland)
http://www.u-blox.com
Division: Cellular Solutions (4G LTE/LTE-A) and Embedded Software Development
Current Assignment: Development of a proprietary delta generation and compression solution (Firmware-over-the-air update project in collaboration with u-blox San Diego)
Past Assignment(s): Protocol Stack Development (MAC Layer) and code-base optimization for multiple processor architectures; Network simulator (eNodeB) development
Certification(s): LTE Air Interface ELP-4003 (ENKI Poland)

Business Automation Intern — July 2014 - August 2014
Telenor Pakistan (A subsidiary of Telenor Group Norway)
http://www.telenor.com.pk
Project: Sales pipeline web portal development and centralization across Telenor Pakistan intranet

Research Assistant (Part-time) October 2013 - June 2014
Center for Advanced Research in Engineering, Islamabad, Pakistan (C@RE)
http://www.carepvtltd.com
Research topic: Reconfigurable computer networking solutions

Business Intelligence Intern June 2013 - August 2013
Techlogix Lahore Pakistan Pvt. Ltd.
http://www.techlogix.com
Project: Business Intelligence Reporting for Gulf International Bank, Bahrain

Electrical Engineering Intern July 2012 - August 2012
Siemens Pakistan Engineering Co. Ltd. (A subsidiary of Siemens AG, Berlin, Germany)
http://www.siemens.com.pk
Business Unit: Transformers; Power Transmission Division

Research-oriented projects

An FPGA based approach to deep packet inspection for the purpose of application aware routing in multi-gigabit content-delivery networks
Supervisor(s): Brig. Dr. Shoab Ahmed Khan (Ph.D. GeorgiaTech), Dr. Zaheer Ahmed (Center for Advanced Research in Engineering, Islamabad, Pakistan)
Design and Implementation of an IEEE 802.3 packet routing mechanism in Verilog and VHDL. Deep packet inspection extracts OSI Layer 4 and 7 features (Protocol and URL) from incoming packets. Packets are then routed to designated output ports depending upon required bandwidth to achieve better QoS. The design is prototyped on NetFPGA 10G Development Board (Xilinx Virtex 5 FPGA Processor).

Multi-threaded client-server model driven communication protocol
Supervisor(s): Dr. Usman Qamar (Ph.D., Post. Doc. Manchester)
Implementation of a multi-threaded client-server communication environment without any limit on number of clients. System implemented using C#, TCP Client and Socket objects. Zero packet loss achieved.

Compiler design
Supervisor(s): Dr. Farhan Riaz (MSCE TU Munich, Ph.D. Porto Portugal)
Design and implementation of a GUI Compiler by employing L-R Parsing. The compiler follows C/C++ like syntax and is able to eradicate comments, white spaces, initialize variables and subsequently evaluate expressions of all lengths.

Speaker Recognition
Supervisor(s): Dr. Usman Akram (National University of Sciences and Technology, Pakistan)
Recognition of speaker (person; irrespective of what they speak) by extracting features (Mel-Frequency Cepstral/Cepstrum Coefficients) from recorded voice segments. Close to perfect results achieved by employing Naïve Bayes Classifier model over a small training dataset.

Feature Recognition and Tracking in real-time video feed

Supervisor(s): Dr. Arslan Shaukat (Ph.D. Manchester), Mr. Ameer Hamza (M.S. University of Southern California)

Rapid object recognition and tracking using OpenCV's haar-cascade libraries for haar-like-feature detection. Implemented using C++. The aim of this project is to detect signs of fatigue in drivers by following their blinking motion and count. This full-fledged solution generates output faster than a simple colour-tracking algorithm implemented using MATLAB.

Search Algorithms

Supervisor(s): Dr. Aasia Khanum (Forman Christian College, Lahore, Pakistan)

This project involves exploring different search algorithms used to sort and produce results from large datasets. This project involves the implementation of splay-tree algorithm to witness the sorting mechanism (zig, zig-zig, zig-zag) which occurs upon data entry, deletion and extraction.

Remote Circuit Control and Actuation

Supervisor: Asst. Prof. Sajid Gul Khawaja (National University of Sciences and Technology, Pakistan), Mr. Umer Farooq (Center for Advanced Research in Engineering, Islamabad, Pakistan)

This project involves developing a solution to take full control of electronic circuits placed in harsh-environments from safer distances. Several solutions were explored (Bluetooth Modules, GSM Modules, WLAN Modules). After a thorough feasibility study, a prototype was developed using Microchip's PIC18 microcontroller, a WLAN module, UART-TTL interface and a WiFi router. The circuit was operative from distances as vast as 300 meters in the open. Zero data loss was achieved in this radius.

Stock Exchange Trend Logging and Analysis

Supervisor(s): Dr. Wasi Haider Butt (National University of Sciences and Technology, Pakistan)

Karachi Stock Exchange's website does not offer RSS feeds. An efficient approach to webpage-scraping and webpage-parsing was explored in this project. Html Agility Pack and XPATH proved to be helpful in achieving this goal. Data was logged in a background thread from KSE website after 5 minute intervals and trend graphs plotted to ease analysis.

Course projects

- **Quad-Core Micro-Coded State Machine**
  B.E. Semester: 7 - Digital System Design | Xilinx ISE Design Suite | Mentor Graphics ModelSim | Verilog
- **Quadrature Phase Shift Keying Digital modulation Scheme implementation**
  B.E. Semester: 7 | Digital Communication | MATLAB | Microsoft Visual C#
- **DC Motor Position Control using PID Algorithm**
  B.E. Semester: 7 | Control/Feedback Control Systems | DC Motor with Encoder | Microchip MPLAB (C++) Compiler |Microcontroller: Microchip PIC18F4520 | L293D Half-Bridge DC Motor Driver | Simulation: Proteus | MATLAB Single-Input-Single-Output System Tool
- **ARMv4T Assembler**
  B.E. Semester: 6 - Microprocessor Based Design | Microsoft Visual C#
- **Audio Equalizer**
  B.E. Semester: 5 - Signals and Linear Systems | MATLAB GUI
- **Spam Filter (Naïve Bayes Classifier)**
  B.E. Semester: 6 - Artificial Intelligence | MATLAB

- **Management Information System and its complete SRS Document**
  B.E. Semester: 5 - Software Engineering | Microsoft Access
- **UML Modeling**
  B.E. Semester: 4 - Object Oriented Programming | Microsoft Visio
- **2D Drawing Application**
  B.E. Semester: 4 - Computer Graphics | Microsoft Visual C#
- **Audio Amplifier**
  B.E. Semester: 3 - Electronic Circuits Lab | Circuit: Design: Proteus | Texas Instruments LM386 Low Voltage Audio Power Amplifier IC
- **Power Supply**
  B.E. Semester: 3 - Electronics 1 | Circuit Design: Proteus | Etched on Printed Circuit Board
- **Data transfer between two terminals over Parallel Port (Interfacing)**
  B.E. Semester: 2 - Algorithms and Computing | Turbo C++
- **Management Information System**
  A-Level Computing | Microsoft Access (Tables, Queries, Reports, Forms)
- **Text Editor with Encryption**
  A-Level Computing | Microsoft Visual Basic .NET
- **Payroll Management System**
  O-Level Computer Studies | Backend: Microsoft Access Database | Frontend: Microsoft Visual Basic 6 Forms (ActiveX Data Object)

Skills

C/C++, Visual Basic, C#, Python, MATLAB, Verilog, Assembly, SQL, Proteus, ARES, SPICE

Awards

- GPA Based Merit Scholarship throughout engineering school (Dean's Honor Roll)
- 5th position across entire batch of 70
- Senior Year Project nominated for Rector's Gold Medal
- Gold Medal for Best Pre-Engineering score in GCE A-Levels

References

Brig. Dr. Shoab Ahmed Khan
M.S. Ph.D. ECE GeorgiaTech
Head of Department Computer Engineering, College of Electrical & Mechanical Engineering, National University of Sciences and Technology, Islamabad, Pakistan
CEO, Center for Advanced Research in Engineering (C@RE), Islamabad, Pakistan
Assistant Adjunct Professor, Michigan State University, USA
shoabak@ceme.nust.edu.pk

Dr. Khurram Muhammad
M.Eng.Sc. Melbourne, Ph.D. Purdue
Texas Instruments, Research in Motion (Blackberry), MStar Semiconductor, MediaTek USA
khurram_muhammad@sbcglobal.net