Dr. Muhammad Faisal Siddiqui

Room # 316, 3rd Floor, Academic Block-I, COMSATS University, Islamabad, Pakistan
Cell: +92 333 7831241. E-mail: faisal_siddiqui@comsats.edu.pk, URL: Google Scholar Profile

Career Objective

To do something unique in the field of Digital System Design, FPGA based Hardware Accelerators, Computer Architecture, Embedded Systems and Medical Imaging

Professional Education

- **Doctor of Philosophy (PhD)** from University of Malaya, Kuala Lumpur, Malaysia. 2013-2016.
  Scholarship: Received UM Bright Sparks Program University of Malaya [Fully Funded].
  Title of Thesis: Magnetic Resonance Imaging SENSE Reconstruction System using FPGA

- **Master of Science in Electrical Engineering** from COMSATS Institute of Information Technology, Islamabad. 2011-2012. **CGPA – 4.00 / 4.00**.
  Title of Thesis: Low Power and Low Area Multiplier-Less Discrete Cosine Transform (DCT) Architecture

- **Bachelors of Science in Computer Engineering** from COMSATS Institute of Information Technology, Islamabad. 2006 – 2010. **CGPA – 3.8 / 4.00**
  Scholarship: Received Board Position Holder Scholarship from CIIT, Islamabad, Pakistan.

Working Experience

- **Tenured Associate Professor** at COMSATS University, Islamabad. 1st Jul 2023 – till date
- **Assistant Professor** at COMSATS University, Islamabad. 29th Jul 2016 – 30th Jun 2023
- **Lecturer** in COMSATS, Islamabad. 31st Dec 2012 – 30th Sep 2013
- **Research Associate** in COMSATS, Islamabad. 19th July 2010 – 30th Dec 2012

Merit Awards

- **Chancellor's Gold Medal** on securing first position in BS(CE) in overall campuses of COMSATS Institute of Information Technology.
- **Campus Gold Medal** on securing first position in BS(CE) in Islamabad Campus of COMSATS Institute of Information Technology.
- **Gold Medal** on securing First Position in Intermediate overall in Balochistan Board of Intermediate and Secondary Education.
- **Research Productivity Award for 2012** from COMSATS Institute of Information Technology, Islamabad.

- **Research Productivity Award for 2011** from COMSATS Institute of Information Technology, Islamabad.

Funded Projects as a PI

- **Project Title:** Implementation of hardware efficient QC-LDPC codes for DVB-S2 over SDR's (Completed)
  Funding Agency: NESCOM, Pakistan
- **Project Title:** FPGA Implementation of Security Algorithm for cellular- V2X (Completed)
  Funding Agency: NGIRI, IGNITE, National Technology Fund, Pakistan

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US Patents

- **Siddiqui, M. F.**, & Hammad Omer. Parameterized FPGA implementation of a real-time sensitivity encoding reconstruction. U.S. Patent No. 10,488,483. 26 Nov. 2019.

Journal Publications

- **Siddiqui, M. F.**, Reza, A. W., Shafique, A., Omer, H., & Kanesan, J. (2017). FPGA Implementation of Real-time SENSE Reconstruction using Pre-scan and Emaps Sensitivities. *Magnetic Resonance Imaging*, 44, 82-91.
- **Siddiqui, M. F.**, Reza, A. W., & Kanesan, J. (2015). An Automated and Intelligent Medical Decision Support System for Brain MRI Scans Classification. *PloS one*, *10*(8), e0135875.
- **Siddiqui, M. F.**, Mujtaba, G., Reza, A.W., & Shuib, L. (2017). Multi-Class Disease Classification in Brain MRIs using a Computer-Aided Diagnostic System. *Symmetry*, 9 (37).
- **Siddiqui, M. F.,** Reza, A. W., Kanesan, J., & Ramiah, H. (2014). Investigation of a Novel Common Subexpression Elimination Method for Low Power and Area Efficient DCT Architecture. *The Scientific World Journal*, *2014*.
- **Siddiqui, M. F.**, Reza, A. W., Omer, H., et al. (2015). Parameterized Architecture Design of SENSE for Real-time Reconstruction. *Magnetic Resonance Materials in Physics, Biology and Medicine*, 28, Supplement 1, 277-418.
- **Siddiqui, M. F.**, Ali, F., Javed, M. A., et al. (2023). An FPGA-based performance analysis of hardware caching techniques for Blockchain key-value database. *Applied Sciences*, 13 (7), 1-18.
- Gul, S., **Siddiqui, M. F.**, & ur Rehman, N. (2020). FPGA-Based Design for Online Computation of Multivariate Empirical Mode Decomposition. IEEE Transactions on Circuits and Systems I: Regular Papers, 67, 5040-5050.
- Naveed, K., Akhtar, M. T., **Siddiqui, M. F.**, & ur Rehman, N. (2021). A Statistical Approach to Signal Denoising Based on Data-driven Multiscale Representation. Digital Signal Processing, 108, 102896.

- Javed, M. A., Khan, M. Z., Zafar, U., **Siddiqui, M. F.**, Badar, R., Lee, B. M., & Ahmad, F. (2020). ODPV: An Efficient Protocol to Mitigate Data Integrity Attacks in Intelligent Transport Systems. IEEE Access, 8, 114733-114740.

- Shahzadi, I., **Siddiqui, M. F.**, Aslam, I., & Omer, H. (2020). Respiratory Motion Compensation using Data Binning in Dynamic Contrast Enhanced Golden-Angle Radial MRI. *Magnetic Resonance Imaging*, 70, 115-125.

- Gul, S., **Siddiqui, M. F.**, & Rehman, N. U. (2019). FPGA Based Real-Time Implementation of Online EMD With Fixed Point Architecture. IEEE Access, 7, 176565-176577.

- Qazi, S. A., **Siddiqui, M. F.**, Wikner, J. J., & Omer, H. (2019). ASIC modelling of SENSE for parallel MRI. Computers in biology and medicine, 109, 53-61.

- Khan, S., Lee, D. H., Khan, M. A., **Siddiqui, M. F.**, Zafar, R. F., Memon, K. H., & Mujtaba, G. (2020). Image Interpolation via Gradient Correlation-Based Edge Direction Estimation. *Scientific Programming*, 2020.

- Khan, T., **Siddiqui, M. F.**, & Omer, H. (2019). FPGA based Pipelined Architecture for Real-Time Estimation of Sensitivity Maps using Pre-Scan Method in Parallel MRI. *Journal of Circuits, Systems and Computers*, 29 (08), 2050125.

- Ferdous, R. M., Reza, A. W., & **Siddiqui, M. F.** (2016). Renewable Energy Harvesting for Wireless Sensors using Passive RFID Tag Technology: A review. *Renewable and Sustainable Energy Reviews*, *58*, 1114-1128.

- **Siddiqui, M. F.**, Riaz, R. A., & Naqvi, S. S. (2012). Low Power and Area Efficient DCT Architecture for Low Bit Rate Communication. *Przegląd Elektrotechniczny*, *8*, 216-219.

- **Siddiqui, M. F.**, Bhatti, M. K., et al. (2012). ASIC Design Implementation of Memory Efficient Infinite Impulse Response UWB Equalizer. *Przegląd Elektrotechniczny*, *3b*, 223-227.

- Naqvi, S., Naqvi, R., Riaz, R. A., & **Siddiqui, F**. (2011). Optimized RTL Design and Implementation of LZW Algorithm for High Bandwidth Applications. *Przegląd Elektrotechniczny*, *4*, 279-285.

Book Chapters

- **Siddiqui, M. F.,** Fatima, R., & Javed, M. A., Elliptic Curve Cryptography in Intelligent Transport Systems, *Vehicular Ad-Hoc Networks: Applications and Technology*, 2020.

International Tour

- **SAARC KIZUNA** student/cultural exchange program JAPAN (04 Nov 2012 to 17 Nov 2012).

Workshop, Conference, Symposium and Seminar

- **Muhammad Faisal Siddiqui**, Abubakr Shafique, et al. (2016). Real-time SENSE Reconstruction using Pre-scan and E-maps Sensitivities. In *ISMRM (International Society for Magnetic Resonance in Medicine) 2016 – 24th Annual Meeting and Exhibition.* Singapore: ISMRM.

- **Muhammad Faisal Siddiqui**, Ahmed Wasif Reza, Hammad Omer, et al. (2015). Parameterized Architecture Design of SENSE for Real-time Reconstruction. In *ESMRMB (European Society for Magnetic Resonance in Medicine and Biology) 2015 Congress - 32nd Annual Scientific Meeting* (pp. S216-S217). Edinburgh, UK: ESMRMB.

- **Muhammad Faisal Siddiqui**, Ahmed Wasif Reza, Jeevan Kanesan, and Hammad Omer. (2014). A New Parameterized Architectural Design for SENSE Reconstruction. In *3rd International Conference on Computer Engineering & Mathematical Sciences 2014 (ICCEMS 2014)* (pp. 335-338). Langkawi, Malaysia: S&K.

- Yumna Bilal, Ibtisam Aslam, **Muhammad Faisal Siddiqui**, and Hammad Omer (2022). BPE XD-GRASP: Using GROG-BPE for improved respiratory motion compensation in dynamic contrast enhanced golden-angle radial MRI. In *Joint Annual Meeting ISMRM-ESMRMB 2022 – 31st Annual Meeting and Exhibition.* London, UK: ISMRM

- Yumna Bilal, Ibtisam Aslam, **Muhammad Faisal Siddiqui**, and Hammad Omer (2021). Highly undersampled GROG-BPE radial data reconstruction using Compressed Sensing. In *ISMRM (International Society for Magnetic Resonance in Medicine) 2021 – 29th Annual Meeting and Exhibition*. Vancouver, Canada: ISMRM.

- Aiza Asif, Urooj Zahra, Muhammad Ahmed, **Muhammad Faisal Siddiqui** and Muhammad Awais Javed. (2018). FPGA based implementation of ECDSA for secured ITS. In *10th Computer Science and Electronic Engineering Conference (CEEC 2018).* (pp. 154-158). Colchester/UK: IEEE.

- Tooba Khan, **Muhammad Faisal Siddiqui** and Hammad Omer. (2018). FPGA based real-time sensitivity maps estimation using pre-scan method. In *Joint Annual Meeting ISMRM-ESMRMB 2018*. Paris/France: ISMRM/ESMRMB.

- Sohaib Qazi, **Muhammad Faisal Siddiqui**, J Wikner and Hammad Omer. (2018). ASIC Model of SENSE to Accelerate MR Image Reconstruction. In *Joint Annual Meeting ISMRM-ESMRMB 2018*. Paris/France: ISMRM/ESMRMB.

- **Workshop on FPGA & Verilog [PEC: CPD]:** Resource person of the Continuing Professional Development (CPD) based workshop, held at COMSATS University, Islamabad, Pakistan.

- **Medical Imaging Symposium 2018:** Member of organizing committee of Medical Imaging Symposium 2018, organized by Medical Image Processing Research Group (MIPRG), COMSATS Institute of Information Technology, Islamabad, Pakistan.

- **7 Days workshop on Image Processing:** Attended 7 Days workshop on Image Processing and its Applications, held at COMSATS Institute of Information Technology, Islamabad.

- **International Conference on Frontiers of Information Technology:** Participated in 7th International Conference on Frontiers of Information Technology, held at CIIT, Abbottabad, Pakistan

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Professional Tools/ Evaluation Boards/ Software

- Expert in VIVADO, XILINX Design ISE suite, Quartus II and ModelSIM (Verilog)
- Proficient in VITIS AI, DNNDK, Petalinux
- Expert in using of various FPGA boards (Xilinx/Altera)
- Proficient in MATLAB
- Good in using of Raspberry Pie platforms
- Proficient in use of HDL co-simulation Simulink
- Proficient in Latex software
