

# Irfan Ullah (PhD)

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## **WORK EXPERIENCE**

### **Assistant Professor– November 2022 to till date.**

COMSATS University Islamabad - <http://islamabad.comsats.edu.pk>  
Islamabad, Pakistan

### **Postdoctoral Research Scholar – March 2022 to October 2022**

Microstructural Imaging Lab, Department of Radiology  
University of Iowa - <https://uiowa.edu/>  
Iowa City, USA

### **Lecturer – September 2010 to February 2022**

COMSATS University Islamabad - <http://islamabad.comsats.edu.pk>  
Islamabad, Pakistan

#### **Responsibilities:**

- Teaching undergraduate courses
- Manage and monitor labs related to the assigned courses
- Supervising undergraduate final year projects and guiding student in writing technical reports
- Performing research in Medical Imaging/Robotics/Microprocessors and actively involved in documenting the outcomes of the research in the form of research papers/patents
- Performing any additional administrative duties assigned by the department
- Participating in different social activities such as student week, interdepartmental sports, student projects competitions, technical talks, job exhibitions, etc

### **Research Associate – Feb 2009 to Aug 2010**

Tampere University of Technology - [www.tut.fi](http://www.tut.fi)  
Tampere, Finland

#### **Responsibilities:**

- Worked on the SYSMODEL project. <http://www.sysmodel.eu>
- The project is aimed at providing SMEs with system-level modeling tools for the design and implementation of time and power critical, heterogeneous systems
- In this project, a System Level cycle-accurate model of Hierarchical Network-on-Chip (NoC) for on-Chip Multi-Core Platform using SystemC was developed.

### **Research Associate – Aug 2007 – Aug 2008**

COMSATS University Islamabad - <http://islamabad.comsats.edu.pk>  
Islamabad, Pakistan

#### **Responsibilities:**

- Research in the field of embedded and digital design systems.
- Teaching undergraduate courses and respective Labs.
- Technical report writing.

## **EDUCATION**

### **Ph.D. 2019**

COMSATS University Islamabad, Pakistan

**Research area:** Biomedical Imaging

**Ph.D. Thesis:** Advanced Image reconstruction algorithms in Magnetic Resonance Imaging.  
(<http://pr.hec.gov.pk/jspui/handle/123456789/10553>)

## **M.S (Technology), 2010**

Tampere University of Technology, Tampere, Finland

**Major:** Digital and Computer Electronics **Minor:** Software Systems

**MS Thesis:** SystemC level model of hierarchical Network-on-Chip for system-level on-chip Multi-Core platforms. (<https://trepo.tuni.fi/handle/123456789/6778>)

## **B.S (Computer Engineering), 2007**

COMSATS University Islamabad, Pakistan

**FYP:** Real-time mobile robot with analysis of the surrounding environment and high speed integrated embedded wireless communication system.

## **PATENTS**

1. 'GRAPHICAL PROCESSING UNIT (GPU) IMPLEMENTATION OF MAGNETIC RESONANCE FINGERPRINTING (MRF)', **U.S. Patent No.** US0371015A1, **Type:** Grant, **Filed:** June 19, 2017, **Date of Patent:** April 28, 2020
2. 'GPU BASED IMPLEMENTATION OF SENSE (A PARALLEL MRI ALGORITHM) USING LEFT INVERSE METHOD', **U.S. Patent No.** US10598753, **Type:** Grant, **Filed:** June 19, 2017, **Date of Patent:** March 24, 2020
3. 'GPU BASED IMPLEMENTATION OF SENSE (A PARALLEL MRI ALGORITHM) USING QR DECOMPOSITION', **U.S. Patent No.** US10408906B2, **Type:** Grant, **Filed:** June 19, 2017, **Date of Patent:** September 10, 2019

## **Journal Publication**

1. **Ullah I.**, Hassan, A.M., Saad, R.M. and Omer, H., "**GPU accelerated grouped magnetic resonance fingerprinting using clustering techniques**". Magnetic Resonance Imaging, 97(2023), pp.13-23.
2. Qazi S.A., Tariq F., **Ullah I.**, and Omer H. "**Parallel implementation of L+ S signal recovery in dynamic MRI**". Magnetic Resonance Materials in Physics, Biology, and Medicine, 2020 Jun 29:1-1.
3. Rahman MA, Aribisala BS, **Ullah I**, Omer H. "**Association between scripture memorization and brain atrophy using magnetic resonance imaging**". Acta neurobiologiae experimentalis. 2020;80(1):90.
4. **Ullah I**, Nisar H, Raza H, Qasim M, Inam O, Omer H. "**QR-decomposition based SENSE reconstruction using parallel architecture**". Computers in biology and medicine. 2018 Apr 1;95:1-12.
5. **Ullah I**, Inam O, Aslam I, Omer H. "**Accelerating Parallel Magnetic Resonance Imaging Using p-Thresholding Based Compressed-Sensing**". Applied Magnetic Resonance. 2018:1-19.
6. Qureshi M, Junaid M, Najam A, Bashir D, **Ullah I**, Kaleem M, Omer H. "**Image reconstruction using compressed sensing for individual and collective coil methods**". Biomedical Research. 2016.
7. O. Ahmad, **Ullah I**, J. Iqbal, "**A multi-robot educational and research framework**", International Journal of Academic Research (IJAR) Part A, ISSN: 2075-4124 (print), 2075-7107 (online), 2014, 6(2):217-222, ISI Indexed, (DOI: 10.7813/2075-4124.2014/6-2/A.32)

## **Conference Publication**

1. Aja, S, ..., **Ullah, I.**, ... "**Validation of Deep Learning techniques for quality augmentation in diffusion MRI for clinical studies**" 27th ISMRM & ISMRT Annual Meeting & Exhibition, 03-08 June 2023, Toronto, Canada.
2. Shafique. M, **Ullah. I**, Qazi S.A., Omer. H "Compressed SVD for L+S Matrix Decomposition Model to Reconstruct Undersampled Dynamic MRI" joint ISMRM and ESMRMB conference 2022.
3. Moiz. A Saad. R, **Ullah. I**, Omer. H "GPU Accelerated Grouped Magnetic Resonance Fingerprinting using Clustering Techniques" ISMRM 29th Annual Meeting & Exhibition, 15-20 May 2021, 2021.
4. Arshad, M., **Ullah, I.**, Qureshi, M., Omer, H. "**Radial MR Image Reconstruction through Deep Learning**" 36th Annual Meeting of ESMRMB, Oct 2019, Rotterdam/NL.

5. Aslam, 1., Afsar, K., **Ullah, I.**, Omer, H. “**Optimized CG-SENSE using GROG for non-Cartesian MRI**” 27th ISMRM Annual Meeting& Exhibition, 11-16 May 2019, Montreal, Canada.
6. **Ullah, I.**, Ammar, H. M., Omer, H., “**SENSE Implementation on Graphical Processing Unit (GPU) using LU Decomposition**” In Annual Scientific Meeting of ESMRMB 2017, October 19 – October 21, 2017, Barcelona, Spain, 2017.
7. **Ullah, I.**, Qasim, M.M., Raza, H., Nisar, H., Qazi, S., Omer, H., “**QR Decomposition based SENSE Implementation on Central Processing Unit (CPU) and Graphical Processing Unit (GPU)**” In 33rd Annual Scientific Meeting of ESMRMB 2016, September 29 – October 1, 2016, Vienna, Austria, 2016.
8. **Ullah, I.**, Seiberlich, N., Griswold, M., Omer, H., “**Magnetic Resonance Fingerprinting (MRF) implementation on Graphical Processing Unit (GPU) for exploiting inherent parallelism**” In 33rd Annual Scientific Meeting of ESMRMB 2016, September 29 – October 1, 2016, Vienna, Austria, 2016.
9. **Ullah, I.**, Omer, H., “**Combining CG-SENSE with Compressed Sensing for MR Image reconstruction for Radial and Spiral Trajectories**” In 33rd Annual Scientific Meeting of ESMRMB 2016, September 29 – October 1, 2016, Vienna, Austria, 2016.
10. Qazi, A., **Ullah, I.**, Omer, H., “**Implementation of Low-Rank + Sparse Matrix Decomposition on GPUs for Accelerating Re-Construction Time**” In 33rd Annual Scientific Meeting of ESMRMB 2016, September 29 – October 1, 2016, Vienna, Austria, 2016.
11. Shahzad, H., **Ullah, I.**, Omer, H., “**Combined application of PMRI and CS for MR Image reconstruction**” In 33rd Annual Scientific Meeting of ESMRMB 2016, September 29 – October 1, 2016, Vienna, Austria, 2016.
12. Tallat, S., Shahid, F., **Ullah, I.**, Omer, H., “**Magnetic Resonance Fingerprinting (MRF) Dictionary Construction using Graphical Processing Unit (GPU) for Exploiting Inherent Parallelism**”, In GPU Technology Conference, 2017, Silicon Valley, USA, 2017.

## **RESEARCH GRANTS**

- Pakistan Engineering Council. Research Grant for Project title “IoT Based Automation of rooftop Gardening to Improve the Production and Quality of Organic Food”, 2023-24.
- Pakistan Engineering Council. Research Grant for Project title “IoT Based Remote Patient Health Monitoring system “, 2023-24.

## **RESEARCH INTEREST**

Biomedical Imaging, Embedded Systems, Multi-Processor System on Chip, Artificial Intelligence, Machine Learning, Parallel Computing.

## **MEMBERSHIPS AND RESEARCH ACTIVITIES**

- Member Pakistan Engineering Council. Membership # COMP/04195
- Member ISMRM, Membership # 81013
- Member ESMRMB, Membership # 20347
- Member IEEE, Membership # 93392080
- Member of Organizing Committee International Symposium on System-on-Chip 2009, Tampere, Finland.
- Member of Pak-China Business Forum Organizer Committee. (CUI)
- Microprocessor’s workshop 2012(Organizer), (CUI)
- Training and Tutorial on FPGA “Born to FPGA”, CAST.

## **COURSES TAUGHT**

Microprocessor Systems and Interfacing, Computer Architecture, Digital Logic Design, Principle of Communication systems, Programming Fundamentals

## **ADMINISTRATIVE DUTIES**

- Course Lead Programming Fundamentals
- Member of Continuing Professional Development (CPD) Committee E&CE Department
- Served as an In-charge Computer Engineering Department (2012)
- Member PEC Computer Engineering Group (AC 1 Annexures preparation for PEC)
- Member of Organizing Committee Medical Imaging Symposium 2015 and 2016, CUI,

Islamabad

- Member of Safety Committee E&CE Department
- Member Graduate Thesis Management Committee
- Course Coordinator Digital Electronic Group
- Member Final Exams Enter Departmental Vigilance Committee
- Permanent Member Student Orientation Organizer Committee
- Member of Pak-China Business Forum Organizer Committee
- Class Counsellor for Undergraduate Students (since 2011)
- CEPEX 2011 Organizer Committee
- Member of Organizing Committee International Symposium on System-on-Chip 2009, Tampere, Finland

## **REFERENCES**

<b>Director NDDTN, Head EJD, Prof. Dr Jari Nurmi (Ph.D.),</b> jari.nurmi@tuni.fi Tampere University, Tampere, Finland. <a href="https://www.tuni.fi/en/jari-nurmi">https://www.tuni.fi/en/jari-nurmi</a> . <a href="https://www.tuni.fi/en">https://www.tuni.fi/en</a>	<b>Group lead MIPRG, Associate Prof. Dr Hammad Omer (Ph.D.),</b> Hammad.omer@comsats.edu.pk COMSATS University Islamabad, Islamabad, Pakistan <a href="http://miprg.com/">http://miprg.com/</a> , <a href="https://www.comsats.edu.pk/">https://www.comsats.edu.pk/</a> .
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