

## Career Objective

Seeking a challenging career with a progressive organization that provides an opportunity to capitalize on my technical skills & abilities

## Education

	CGPA/Division
<b>Ph.D. in Life Sciences, Specialization in Physics of Biology</b> <i>University of Geneva, Geneva, Switzerland</i>	<b>(Mar. 2019 – Feb. 2024)</b>
<b>MS Electrical Engineering (Electronics) (2014 – 2016)</b> <i>COMSATS Institute of Information Technology, Islamabad</i>	<b>3.58/4.00</b>
<b>BS Electrical Engineering (Electronics) (2008 – 2012)</b> <i>The University of Faisalabad, Faisalabad</i>	<b>3.23/4.00</b>

## Post-Doctoral Projects

### **Post-Doctoral Researcher (May 2024 - Present)**

Dept. of Radiology, Centre Hospitalier Universitaire Vaudois (CHUV) / Université de Lausanne (UNIL), Lausanne, Switzerland / Centre de la Mémoire, Hôpitaux Universitaires de Genève (HUG) / Université de Genève (UNIGE), Geneva, Switzerland (May 2024 - Present)

**Research Focus:** Working on the Human Brain Glymphatic System Project, focusing on glymphatic flow measurement using 7T Diffusion Weighted Imaging (DWI), including image acquisition, processing, and analysis for brain microstructure

## Ph.D. Thesis

### **Accelerated Cardiac and Renal MRI**

There is a strong link between cardiac and renal pathology especially in chronic kidney disease patients who mainly died from cardiac failure. Magnetic Resonance Imaging (MRI) has a strong potential to improve the diagnostic and monitoring of such patients. However, a combined cardiac and renal MRI exam is challenging due to long MR scan time.

In my PhD, I was successfully able to optimize the multiparametric Cardiac and Renal MR acquisition protocols and developed a novel MR Image reconstruction algorithm for accelerated MRI exams to reduce the scan time for both the cardiac and renal MRIs to improve the patient's comfort. Furthered, I developed a deep learning-based approach to streamline and automate the analysis of renal MRI data for chronic kidney disease (CKD) patients.

## Master's Thesis

### **Non-Cartesian MR Image Reconstruction Using GROG followed by ESPIRiT**

In MRI, the slow data acquisition process is the main issue. Accelerated non-Cartesian trajectories help to attain even faster scan times, but the resulting images may contain aliasing artifacts. In this research, an algorithm is proposed (GROG followed by ESPIRiT) to get the un-aliased MR images.

## Supervised Research Work

### **Master's Thesis:**

1. Fariha Amir, "**Diffusion-Weighted Magnetic Resonance (DW-MR) Image Reconstruction using Deep Learning**", COMSATS University Islamabad, Pakistan (Completion Year: 2021)

### **Bachelor's Thesis:**

1. Fatima Sattar, Sadia Ahsan, "**Reference-free N / 2 Ghost Artifact Correction of Diffusion weighted Imaging using Deep Learning**", COMSATS University Islamabad, Pakistan (Completion Year: 2023)
2. Fariha Amir, Husnain Javed Bhatti, "**Compressively Sampled non-Cartesian MR image reconstruction using GROG with generalized thresholding techniques**", COMSATS University Islamabad, Pakistan (Completion Year: 2019)
3. Haseeb Hassan, Rida Zainab, "**GROG based Radial MR Image Reconstruction using Total Variation constraints**", COMSATS University Islamabad, Pakistan (Completion Year: 2019)

## Professional Experience

- **Research Assistant**

Functional Cardiac Imaging Group, Department of Radiology and Medical Informatics, Division of Radiology, Hospital University of Geneva, Switzerland (Mar 2019 – April 2024)

**Responsibilities:** To develop novel MR Image Acquisition and Reconstruction methods for Cardiac MRI; To develop novel methods to streamline and automate the analysis of allograft renal CKD patients; Cardiac and Renal MR Protocol Optimization; CKD patients scheduling and scanning at 3T MRI; Data analysis and statistics.

- **Lab Engineer**

COMSATS Institute of Information Technology, Islamabad (May 2016 – Feb 2019)

**Responsibilities:** Research Project Supervision, including MRI Image reconstruction; Conducting Students Labs

- **Research Assistant**  
Medical Image Processing Research Group (MIPRG), Comsats IIT, Islamabad  
(Feb 2016 – May 2016)  
**Responsibilities:** Research Project Supervision, including MRI Image reconstruction;  
Teaching Physics of MRI, Digital Image processing
- **Trainee Engineer**  
Lyallpur Chemicals & Fertilizer (Pvt.) Limited, Jaranwala (Aug 2013 – Jan 2014)
- **Instructor/Lab Engineer**  
Faisalabad College of Technology & Management Sciences, Faisalabad  
(Jan 2013 – Jun 2013)
- **Internee**  
220 KV Grid Station Nishatabad, Faisalabad (Jun 2013 – Jul 2013)

### **Technical Skills**

- **Programming**  
MATLAB Programming, Python, R, Bash, Verilog 2001, C, C++, PLC Programming
- **Simulation Tools**  
MATLAB, Anaconda, RStudio, Linux, High Frequency Structure Simulator (HFSS)
- **Clinical Tools**  
Cardiovascular Imaging (CVi42), FMRIB Software Library (FSL), MRtrix3,  
Advanced Normalization Tools (ANTs), 3D Slicer, ITK-Snap
- **Microsoft Office**  
MS Word, Excel, PowerPoint, Publisher

### **Area of Interest**

- Deep Learning / Machine Learning
- Radiomics for Biomarker discovery
- MR Image Reconstruction & Analysis
- Diffusion Weighted Imaging (DWI)
- Brain, Cardiac & Renal MR Imaging
- Digital Image & Signal Processing
- Electronic Devices & Circuits
- Logic Design & Switching Theory
- Power Electronics
- Industrial Process Control

## Memberships/ Responsibilities

- International Society for Magnetic Resonance in Medicine (ISMRM)  
**(ISMRM ID # 81022)**
- European Society for Magnetic Resonance in Medicine and Biology (ESMRMB)  
**(ESMRMB ID # 20685)**
- Society for Cardiovascular Magnetic Resonance (SCMR)  
**(SCMR ID # 66296969)**
- Pakistan Engineering Council  
**(PEC # ELECT/35163)**

## List of Publications

### Journals:

1. Y. Bilal, I. Aslam, M. F. Siddiqui, O. Inam, K. Amjad, J. H, Alkhateeb, and H. Omer. 2024. **"GROG Facilitated Compressed Sensing for Radial MRI."** IEEE Access 12: 178441–59 (2024).
2. F. Aamir, H.J. Bhatti, I. Aslam, F. Najeeb, H. Omer, **"GROG-pCS: GRAPPA Operator Gridding with CS-based p-thresholding for Under-sampled Radially Encoded MRI"**. International Journal of Emerging Multidisciplinaries: Biomedical and Clinical Research, 1(1).
3. I. Aslam, L. A CROWE, M. KASSAI, H. Omer and JP. VALLEE, **"Real-time, Single Breath-hold, Multi-slice, 2D Cine Radial MR Image Reconstruction using sc-GROG k-t ESPIRiT"** Biomed. Phys. Eng. Express (2022): 8 (6), 065037
4. I. Aslam, F. Aamir, M. Kassai, L. A. Crowe, P.-A Poletti, S. De Seigneux, S. Moll, L. Berchtold, J.-P. Vallee **"Validation of automatically measured T1 map cortico-medullary difference ( $\Delta T1$ ) for eGFR and Fibrosis assessment in allograft kidneys"**. PLOS ONE 18 (2023), e0277277
5. F. Aamir, H. J. Bhatti, I. Aslam, F. Najeeb, and H. Omer, **"GROG-pCS: GRAPPA Operator Gridding with CS-based p-thresholding for Under-sampled Radially Encoded MRI"**, IJEMD-BMCR, vol. 1, no. 1, Jun. 2023.
6. F. Aamir, I. Aslam, M. Irshad and H. Omer, **"Accelerated Diffusion-Weighted MR Image Reconstruction Using Deep Neural Networks"**, Journal of Digital Imaging, pp. 1-13, 2022.
7. M. Pruijm, I. Aslam, B. Milani, W. Brito, M. Burnier, N. M Selby, and J-P Vallée. **"Magnetic Resonance Imaging to Diagnose and Predict the Outcome of Diabetic Kidney Disease—Where Do We Stand?"**. Kidney and Dialysis 2, no. 3 (2022): 407-18.

8. L. Berchtold, L. A. Crowe, C. Combescure, M. Kassai, I. Aslam, D. Legouis, S. Moll, P-Y Martin, S. De Seigneux, J.P. VALLEE, **“Diffusion-Magnetic Resonance Imaging predicts decline of kidney function in chronic kidney disease and in patients with a kidney allograft”**. *Kidney Int.* (2022). doi:10.1016/j.kint.2021.12.014
9. M. Qureshi, O. Inam, S. A. Qazi, I. Aslam, and H. Omer, **“Tangent Vector-based Gradient Method with l12 -Regularization: Iterative Half Thresholding Algorithm for CS-MRI,”** *J. Magn. Reson.*, vol. 333, p. 107080, Dec. 2021.
10. I. Shahzadi, M. F Siddiqui, I. Aslam and H. Omer **“Respiratory motion compensation using data binning in dynamic contrast enhanced golden-angle radial MRI”** *Magnetic Resonance Imaging*. Vol. 70, pp: 115-125 (2020 - Impact Factor: 2.053)
11. F. Najeeb, M. Usman, I. Aslam, S.A. Qazi and H. Omer, **“Respiratory motion-corrected, compressively sampled dynamic MR image reconstruction by exploiting multiple sparsity constraints and phase correlation-based data binning”**. *MAGMA*, Vol 33(3), pp:411-419 (2020 - Impact Factor: 1.956).
12. I. Shahzadi, I. Aslam, S. A. Qazi and H. Omer, **“Golden-Angle Radial Sparse Parallel MR Image Reconstruction Using SC-GROG Followed by Iterative Soft Thresholding”**. *Appl Magn Reson*. Vol 50, pp: 977–988 (2019 - Impact Factor: 0.864)
13. I. Ullah, O. Inam, I. Aslam. and H. Omer, **“Accelerating Parallel Magnetic Resonance Imaging Using p-Thresholding Based Compressed-Sensing”**, *Appl. Magn. Reson*. Vol. 50, 243–261 (2019 - Impact Factor: 0.864)
14. I. Aslam, F. Najeeb, and H. Omer, **“Accelerating MRI Using GROG Gridding Followed by ESPIRiT for Non-Cartesian Trajectories,”** *Appl. Magn. Reson.*, vol. 49, no. 1, pp. 107–124, (2018 - Impact Factor: 0.77)

### **Conferences:**

1. A. Huber, I. Aslam, S. Seigneux, T. Perrot, JP. Vallée, M. Pruijm, L. Berchtold, **#2484 Diffusion magnetic resonance imaging, a noninvasive tool to assess fibrosis level in both native and allograft kidneys**, *Nephrology Dialysis Transplantation*, Volume 39, Issue Supplement\_1, May 2024, gfae069–0697–2484, <https://doi.org/10.1093/ndt/gfae069.697>
2. A. Huber, S. Seigneux, I. Aslam, T. Perrot, JP Vallée, M. Pruijm, L. Berchtold, **#2478 Multiparametric magnetic resonance imaging predicts decline of kidney function but does not perform better than diffusion-weighted MRI alone**, *Nephrology Dialysis Transplantation*, Volume 39, Issue Supplement\_1, May 2024, gfae069–1431–2478, <https://doi.org/10.1093/ndt/gfae069.1431>

3. D. Wenz, T. Perrot, I. Aslam, G. F. Piredda, et.al. **“Prostate MRI at 7T using high-performance gradients and an 8Tx/16Rx RF array: a clinical feasibility study”**, in proceedings of 33<sup>rd</sup> ISMRM Annual Meeting & Exhibition, 04-09 May 2024, Singapore (Abstract #3517)
4. P. Calarnou, A.C. Ogier, J.B. Ledoux, I. Aslam, J.P. Vallée, J. Yerly, and R. B. V. Heeswijk, **“Navigator-gated 2D radial MR fingerprinting of the kidney at 3T”**, in proceedings of 33<sup>rd</sup> ISMRM Annual Meeting & Exhibition, 04-09 May 2024, Singapore, (Abstract #2753)
5. I. Aslam, F. Aamir, M. Kassai, L. A. Crowe, S. De Seigneux, S. Moll, L. Berchtold, J.-P. Vallee **“Validation of automatically measured  $\Delta T1$  values correlated with eGFR and fibrosis assessment of allograft kidneys”**, in proceedings of 31<sup>st</sup> Joint Annual Meeting ISMRM-ESMRMB London, England, United Kingdom, 07-12 May 2022 (Abstract # 0481: Power Pitch)
6. I. Aslam, F. Aamir, M. Kassai, L. A. Crowe, S. De Seigneux, S. Moll, L. Berchtold, J.-P. Vallee **“Validation of Automatically Measured  $\Delta T1$  values Correlated with eGFR and Fibrosis of Allograft Kidneys”**, accepted in Swiss Congress of Radiology (SSR), June 23-25, 2022, (Presented - Oral Presentation)
7. M. Kassai, L. A. Crowe, J. Walenczak, J.-F. Deux, I. Aslam, M. Schmidt, R. M. Botnar, C. Prieto, K. Kunze, R. Sudy, D. Shah, J.-P. Vallee **“Comparison of left atrium scar tissue thresholding on a prototype 3D LGE sequence using multiple cut-off values”** accepted in Swiss Congress of Radiology (SSR), June 22-25, 2022, (Presented - Oral Presentation)
8. I. Aslam, F. Aamir, L.A. CROWE, M. KASSAI, H. Omer, J.P. VALLEE **“CNN U-Net based Automated Cortex and Medulla Segmentation of Transplanted T1 map Chronic kidneys”** in proceedings of ISMRM Workshop on Kidney MRI Biomarkers: The Route to Clinical Adoption: (Philadelphia • Lisbon • Online), Sep. 10 – 12, 2021 (Presented - Power Pitch)
9. F. Aamir, I. Aslam, H. Omer **“Neuro-imaging DW-MR data Reconstruction through cascaded neural network”** in proceedings of 38th ESMRMB Annual Scientific Meeting (ONLINE), Oct. 07 – 09, 2021 (Abstract # A079-2021)
10. F. Aamir, I. Aslam, H. Omer **“Under-sampled diffusion-weighted MR image reconstruction through convolution neural network”** in proceedings of 38th ESMRMB Annual Scientific Meeting (ONLINE), Oct. 07 – 09, 2021 (Abstract # A079-2021)
11. I. Aslam, F. Aamir, L.A. CROWE, M. KASSAI, H. Omer, J.P. VALLEE **“Reconstruction of Whole-Heart Cardiac Radial MRI using Neural Network Transfer Learning Approach”** in proceedings of 29th ISMRM Annual Scientific Meeting (ONLINE), May. 15 – 20, 2021 (Abstract # 3538)

12. Y. Bilal, I. Aslam, M. F. Siddiqui, H. Omer, “**Highly undersampled GROG-BPE radial data reconstruction using Compressed Sensing**”, in proceedings of 29th ISMRM Annual Scientific Meeting (ONLINE), May. 15 – 20, 2021(**Abstract # 1171**)
13. I. Aslam, L.A. CROWE, F. Aamir, M. KASSAI, H. Omer, J.P. VALLEE “**NUFFT and GROG for Whole Heart Cardiac Cine Radial MR Image Reconstruction using Deep Learning**” in proceedings of 24<sup>th</sup> Society for Cardiovascular Magnetic Resonance (SCMR) (ONLINE), Feb 18 - 20, 2021 (**Abstract # 963575**)
14. I. Aslam, L.A. CROWE, F. Aamir, M. KASSAI, H. Omer, J.P. VALLEE “**Whole Heart Cardiac Cine Radial MR Image Reconstruction using Deep Neural Network (DNN)**” Swiss Congress of Radiology (SSR), June 24-26, 2021 (**Abstract # 336**)
15. I. Aslam, L.A. CROWE, F. Aamir, M. KASSAI, H. Omer, J.P. VALLEE “**Accelerated Brain and Cardiac MR Image Reconstruction using Deep Learning**” in proceedings of Biomarker Day 2021; Translating brain biomarker research to clinical practice: Promises and Pitfalls (ONLINE), March 17, 2021.
16. R. Rani, F. Aamir, I. Aslam, H. Omer “**Improved GROG based Sparse-SENSE Reconstruction using Iterative Estimation of Receiver Coils Sensitivity Maps**” in proceedings of 37th ESMRMB Annual Scientific Meeting (ONLINE), Sep. 30 – Oct. 02, 2020 (**Abstract # 1378**)
17. F. Aamir, H. J. Bhatti, I. Aslam, H. Omer “**CS based p-thresholding with pMRI for the Reconstruction of Radial MRI data**” in proceedings of 37th ESMRMB Annual Scientific Meeting (ONLINE), Sep. 30 – Oct. 02, 2020 (**Abstract # 1360**)
18. I. Aslam, L. A CROWE, M. KASSAI, J. VALLEE, H. Omer “**Reconstruction of Highly Accelerated Radial Cardiac Cine MRI using GROG based k-t ESPIRiT with TV Constraint**” in proceedings of 27<sup>th</sup> ISMRM Annual Meeting & Exhibition, 11-16 May 2019, Montreal, Canada. (**Abstract #4756**)
19. Z. Javed, I. Aslam, H. Omer “**Self-Calibrated GRAPPA Operator Gridding (SC-GROG) for radially encoded Multi-Slice (SMS) Imaging**” 27<sup>th</sup> ISMRM Annual Meeting& Exhibition, 11-16 May 2019, Montreal, Canada. (**Abstract #2437**)
20. K. Afsar, I. Aslam, H. Omer “**Sparse-SENSE Reconstruction of GROG gridded Radial MRI**” 27<sup>th</sup> ISMRM Annual Meeting& Exhibition, 11-16 May 2019, Montreal, Canada. (**Abstract #2439**)
21. A. Hussain, F. Najeeb, I. Aslam, H. Omer, and Mujahid Nisar “**Respiratory Motion Corrected GROG based L+S Reconstruction for Free Breathing Golden-Angle Radial MRI**” 27<sup>th</sup> ISMRM Annual Meeting& Exhibition, 11-16 May 2019, Montreal, Canada. (**Abstract #4493**)
22. I. Aslam, K. Afsar, F. Najeeb, I. Ullah, H. Omer “**Optimized CG-SENSE using GROG for Radial MRI**” In proceedings of 36th ESMRMB Annual Scientific Meeting, Rotterdam/NL, Oct. 03 – 05, 2019

23. H. J. Bhatti, F. Amir, I. Aslam, H. Omer, “**Reconstruction of under-sampled Radial MRI using SC-GROG followed by Singular Value Thresholding (SVT) based CS**”, In proceedings of 36th ESMRMB Annual Scientific Meeting, Rotterdam/NL, Oct. 03 – 05, 2019
24. R. Zainab, M. H. Hassan, R. Zainab, I. Aslam, H. Omer, “**Calibrationless Parallel Imaging with Compressed Sensing for GROG based Radial MRI**”, In proceedings of 36th ESMRMB Annual Scientific Meeting, Rotterdam/NL, Oct. 03 – 05, 2019
25. M. H. Hassan, R. Zainab, I. Aslam, K. Afsar, H. Omer “**GROG based Compressed Sensing for Accelerated Radial MRI**” In proceedings of 36<sup>th</sup> ESMRMB Annual Scientific Meeting, Rotterdam/NL, Oct. 03 – 05, 2019
26. I. Aslam, I. Shahzadi, F. Najeeb, H. Omer “**GROG based Reconstruction of non-Cartesian MRI using CG-SENSE**” In proceedings of 34<sup>th</sup> ESMRMB Annual Scientific Meeting, Barcelona, Oct. 19 – 21, 2017 (**Abstract-136**)
27. I. Shahzadi, S. Qazi, I. Aslam, H. Omer “**GPU Implementation of GRASP for Accelerated Reconstruction in Dynamic Contrast Enhanced MRI**” In proceedings of 34<sup>th</sup> ESMRMB Annual Scientific Meeting, Barcelona, Oct. 19 – 21, 2017 (**Abstract-148**)
28. A.R. Shahid, I. Aslam, H. Omer “**Accelerating MRI using Non-Cartesian Radial k-space Trajectory**” In proceedings of 34<sup>th</sup> ESMRMB Annual Scientific Meeting, Barcelona, Oct. 19 – 21, 2017 (**Abstract-465**)
29. Z. Javed, I. Aslam, H. Omer “**POCS-SENSE based reconstruction of Multislice Parallel Imaging**” In proceedings of 34<sup>th</sup> ESMRMB Annual Scientific Meeting, Barcelona, Oct. 19 – 21, 2017 (**Abstract-466**)
30. S. Qazi, I. Shahzadi, I. Aslam, H. Omer “**Accelerating GRAPPA Operator Gridding (GROG) for L+S GRASP Reconstruction using GPU**” In proceedings of 34<sup>th</sup> ESMRMB Annual Scientific Meeting, Barcelona, Oct. 19 – 21, 2017 (**Abstract-575**)
31. F. Najeeb, I. Aslam, I. Shahzadi, H. Omer “**Line Profile Measure as a stopping Criterion in L +S Reconstruction**” In proceedings of 34<sup>th</sup> ESMRMB Annual Scientific Meeting, Barcelona, Oct. 19 – 21, 2017 (**Abstract-645**)
32. F. Najeeb, I. Aslam, H. Omer “**Motion-Corrected L +S Reconstruction of Dynamic MRI Data**” In proceeding of ISMRM Workshop on Motion Correction in MRI & MRS, At Vineyard Hotel, Cape Town, South Africa, Sept. 08 – 11, 2017.
33. M. Bashir, S. A. Qazi, I. Aslam, H. Omer “**L+S Reconstruction using Iterative Soft Thresholding and Separable Surrogate Functional (SSF) Method**” In proceedings of 33rd ESMRMB Annual Scientific Meeting, Austria, Sept. 29 – Oct. 1, 2016 (**Abstract-116**)



34. I. Shahzadi, I. Aslam, S. A. Qazi, H. Omer “Coil Sensitivity Maps Estimation for  $k$ -t SPARSE SENSE Reconstruction using Eigen-Value Approach” In proceedings of 33rd ESMRMB Annual Scientific Meeting, Austria, Sept. 29 – Oct. 1, 2016 (Abstract-119)
35. I. Shahzadi, I. Aslam, S. A. Qazi, H. Omer “GRAPPA Operator Gridding (GROG) for Optimized L+S GRASP Reconstruction of Dynamic Contrast Enhanced MRI” In proceedings of 33rd ESMRMB Annual Scientific Meeting, Austria, Sept. 29 – Oct. 1, 2016 (Abstract-122)
36. I. Shahzadi, I. Aslam, S. A. Qazi, H. Omer “Optimized GRASP for Dynamic Contrast Enhanced MRI using GRAPPA Operator Gridding (GROG) and Iterative Soft-Thresholding” In proceedings of 33rd ESMRMB Annual Scientific Meeting, Austria, Sept. 29 – Oct. 1, 2016 (Abstract-126)
37. I. Aslam, F. Najeeb, H. Omer “Accelerating radial MRI using GROG followed by ESPIRiT” In proceeding of 24th ISMRM Annual Meeting 2016, Singapore, (Abstract-1768)

## References

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