Syed Murtaza Arshad

3rd Year Ph.D. Candidate
Electrical & Computer Engineer

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EDUCATION

2026 (Expected)	**Ph.D.** Electrical & Computer Engineering **|** Post-candidacy *Advisors: Rizwan Ahmad, Ph.D. & Lee C. Potter, Ph.D.* **The Ohio State University, Columbus**, OH, US	GPA: **4/4**
June 2024	**M.S.** Electrical & Computer Engineering, **The Ohio State University, Columbus**, OH, US	GPA: **4/4**
May 2019	**B.S.** Electrical Engineering with Honors **|** Gold Medalist **University of Engineering and Technology, Lahore**, Pakistan	GPA: **3.95/4** Rank: **1/142**

RESEARCH INTERESTS

Optimization techniques, Bayesian modeling, signal processing, machine learning, deep learning, robust regression, variable splitting, inverse modeling, outlier rejection, dynamic imaging, image reconstruction, biomedical imaging.

SKILLS

Programming Languages: Python, MATLAB, Java, C, C++

Programming Libraries: PyTorch, Optuna, OpenCV, TensorFlow, Scikit-learn, NumPy

Relevant Courses: Signal Processing, Machine Learning, Medical Imaging & Processing, Optimization, Probability, Linear Mathematics, Convex & Stochastic Optimization, Stochastic Processes & Estimation.

PUBLICATIONS & RESEARCH WORK

Journal Articles

2024 **Motion-robust free-running volumetric cardiovascular MRI. | Paper | Code**
Authors: **S.M. Arshad,** L. C. Potter, C. Chen, Y. Liu, et al.
Journal: *Magnetic Resonance in Medicine* ***(MRM)***, 92(3).
- Developed an **image reconstruction** method integrated with **outlier rejection** to recover high-quality 3D cine and 4D flow cardiovascular MR images at rest and under in-magnet exercise.

2024 **Expectation-Maximization (EM) algorithm-based motion correction and outlier rejection in XD CMR. | (Manuscript in-progress, targeted journal: IEEE TMI)**
Authors: **S.M. Arshad**, L.C. Potter, R. Ahmad
- Proposing an image reconstruction technique for dynamic MRI, 'EMORe,' to recover motion robust XD CMR.

2024 **Motion-Guided Deep Image Prior for Cardiac MRI | Preprint**
Authors: M. Vornehm, C. Chen, M.A. Sultan, **S.M. Arshad**, et al.
Targeted journal: *Magnetic Resonance in Medicine* ***(MRM).***

2024 **Accelerated real-time cine and flow under in-magnet staged exercise. | Preprint**
Authors: P. Chandrasekaran, C. Chen, Y. Liu, **S.M. Arshad**, et al.
Journal: Under review in *Journal of Cardiovascular Magnetic Resonance* ***(JCMR)***.

Peer-reviewed Abstracts

2024 **EMORe: Motion-robust XD-CMR reconstruction using Expectation-Maximization (EM) algorithm. | Link**
Authors: **S. M. Arshad,** L. C. Potter, Xuan Lei, R. Ahmad
Conference: Accepted for ***SCMR 2025***, ***Washington, DC.*** To be Published in ***JCMR.***

2024 **Motion-robust 3D cine imaging using compressive recovery with outlier rejection (CORe). |** Link
Authors: **S.M. Arshad**, L.C. Potter, C. Chen, et al.
Conference: ***SCMR 2024*** *Annual Scientific Sessions,* ***London, UK****.* Published in ***JCMR Vol. 26.***

2024 **Motion-Guided Deep Image Prior for Dynamic Cardiac MRI.**
Authors: M. Vornehm, C. Chen, M.A. Sultan, **S.M. Arshad**, et al.
Conference: Submitted for ***ISMRM 2025*** *Annual Meeting, Honolulu, Hawai'i*

2024 **Motion-Guided Deep Image Prior for 3D Real-Time Cine (M-DIP-3D).**
Authors: C. Chen, M. Vornehm, M.A. Sultan, **S.M. Arshad**, et al.
Conference: Submitted for ***ISMRM 2025*** *Annual Meeting, Honolulu, Hawai'i*

2024 **Free-Running Time-Resolved 3D+t CMR at 40 Hz Under 2 Minutes using Cartesian Sampling and CMR-MOTUS.**
Authors: T.E Olausson, M.L. Terpstra, E. Versteeg, **S.M. Arshad,** et al.
Conference: Submitted for ***ISMRM 2025*** *Annual Meeting, Honolulu, Hawai'i*

2023 **Motion artifact reduction in self-gated CMR 4D flow imaging under exercise stress. |** Link
Authors: **S.M. Arshad,** C. Chen, Y. Liu, et al.
Conference: *ISMRM & ISMRT 2023 Annual Meeting & Exhibition,* ***Toronto, ON, Canada***

2023 **Biventricular and hemodynamic assessment under multi-stage exercise using real-time CMR.**
P. Chandrasekaran, C. Chen, Y. Liu, C. Crabtree, **S.M. Arshad**, et al.
Conference: *2023 ISMRM & ISMRT Annual Meeting & Exhibition,* ***Toronto, ON, Canada.***

INVENTIONS & PATENTS

2024 **Systems and Methods for Cardiovascular Magnetic Resonance Imaging.** | ***Patent-pending***
EM-based optimization for CMR image reconstruction | Application Number: 63/466,088

2023 **Motion Robust Cardiovascular Imaging.** | ***Patent-pending***
Optimization with outlier rejection for volumetric CMR imaging | Application Number: 63/663,874

2019 **iSight: Computer Vision & Ultrasonic Sensor based Smart Cane & Glasses for the Visually Impaired**
Prototype developed for B.S. Thesis using OpenCV and TensorFlow **|** **Video**
IEEE Humanitarian Project Award winner at *54th IEEE Annual Meeting,* ***Baltimore, MD.***

PRESENTATIONS & POSTERS

2025 (Upcoming Oral presentation) **"EMORe: Motion-robust XD-CMR reconstruction using Expectation-Maximization (EM) algorithm."** *SCMR '25,* ***Washington, DC.***

2024 (Oral presentation) **"Motion robust 3D cine imaging using Compressive Recovery with Outlier Rejection (CORe)."** *CMR '24 Rapid Fire: Dealing with Motion,* ***London, UK.***

2024 (Poster presentation) **"EMORe: Motion-robust XD-CMR reconstruction using Expectation-Maximization (EM) algorithm."** *Kraus Memorial Poster Competition '24, The Ohio State University,* ***Columbus, OH.*** **| 2nd Position Winner**

2023 (Oral presentation) **"Motion artifact reduction in self-gated CMR 4D flow imaging under exercise stress."** *ISMRM'23: Advanced Flow & Angiography Power Pitch,* ***Toronto, Canada.***

2023 (Poster presentation) **"Motion-robust free-running volumetric cardiovascular MRI."** *Kraus Memorial Poster Competition'23, The Ohio State University,* ***Columbus, OH.***

HONORS & AWARDS

2024 2nd Position, Kraus Memorial Poster Competition, The Ohio State University.

2024 Graduate Associate Leadership Award (GALA), The Ohio State University.

2024 Judge for the Ray Travel Award, The Ohio State University.

2023 Mentor, GUIDE Peer Mentoring Program, The Ohio State University.

2023 Judge, Career Development Grant (CDG), The Ohio State University.

2023 Judge, HackOHI/O Hackathon, The Ohio State University.

2021 Explore Challenge Winner, innovative idea competition, ICI Pakistan Ltd.

2019 6 Gold Medals for Academic Excellence, University of Engineering and Technology, Lahore, Pakistan.

2019 Best Student Performance Award, Electrical Engineering Class of 2019, University of Engineering and Technology, Lahore, Pakistan.

2019 1st Position, DICE Virtual Innovation National Competition, Pakistan.

2019 Best Project in Computer Engineering Award, Department of Electrical Engineering, University of Engineering Technology, Lahore, Pakistan.

2015-2019 Dean's Merit Scholarship Award, awarded to the top 10 undergraduates each semester, University of Engineering and Technology, Lahore, Pakistan.

REFERENCES

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