Syed Murtaza Arshad

5th Year Ph.D. Candidate, Electrical & Computer Engineering | Presidential Fellow

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EDUCATION

Jan 2022 – Summer 2026 (Expected)	**Ph.D.** Electrical & Computer Engineering *Advisors: Rizwan Ahmad, Ph.D. & Lee Potter, Ph.D.* **The Ohio State University, Columbus**, OH, US	GPA: **4.0/4.0** **Post-candidacy**
Jan 2022 – May 2024	**M.S.** Electrical & Computer Engineering, **The Ohio State University, Columbus**, OH, US	GPA: **4.0/4.0**
Oct 2015 – May 2019	**B.S.** Electrical Engineering with Honors **|** Gold Medalist **University of Engineering and Technology, Lahore**, Pakistan	GPA: **3.95/4.0** Rank: 1/142

WORK EXPERIENCE

May 2025 – Aug 2025	**Canon Medical Research USA, Inc. (CMRU)** *MR Feature Development Research Scientist Intern*	Cleveland, Ohio
Jan 2022 – Ongoing	**The Ohio State University** *Graduate Research Associate*	Columbus, Ohio
Jul 2019 – Dec 2021	**ICI Pakistan, Ltd.** *Electrical & Instrumentation Manager*	Sheikhupurra, Pakistan
Jun 2018 – Aug 2018	**Schlumberger, Ltd** *Electrical Engineering Intern*	Islamabad, Pakistan
Jul 2017 – Sep 2017	**Lahore University of Management Sciences (LUMS)** *Research Intern*	Lahore, Pakistan

RESEARCH INTERESTS

Image reconstruction, machine learning, deep learning, deep image priors, optimization algorithms, outlier rejection, cardiac MRI, whole-heart 4D flow imaging, real-time imaging, low-field imaging.

SKILLS

Programming Languages:	Python, MATLAB, Java
Programming Libraries:	PyTorch, NumPy, Optuna, OpenCV, TensorFlow, Scikit-learn
Relevant Courses:	Machine Learning, Probability & Random Variables, Signal Processing, Linear Mathematics, Convex & Stochastic Optimization, Stochastic Processes & Estimation, Magnetic Resonance Imaging, Medical Imaging and Processing.

PUBLICATIONS & RESEARCH WORK

Journal Articles

2025 *Title:* **EMORe: Motion-Robust 5D MRI Reconstruction via Expectation-Maximization-Guided Binning Correction and Outlier Rejection. |** GitHub Code Link

Authors: **S.M. Arshad**, L. C. Potter, Y. Liu, C. Crabtree, M.S. Tong, R. Ahmad

Journal: Under revision, submitted to *IEEE Transactions on Medical Imaging (TMI)*

Link: (Preprint) https:/arxiv.org/abs/2507.23224

2024	*Title:*	**Motion-robust free-running volumetric cardiovascular MRI. |** GitHub Code Link
	Authors:	**S.M. Arshad**, L. C. Potter, C. Chen, Y. Liu, et al.
	Journal:	*Magnetic Resonance in Medicine (MRM) 92, no. 3 (2024): 1248-1262.*
	Link:	https://doi.org/10.1002/mrm.30123
2025	*Title:*	**A multi-dynamic low-rank deep image prior (ML-DIP) for real-time 3D cardiovascular MRI.**
	Authors:	C. Chen, M. Vornehm, P. Chandrasekaran, M.A. Sultan, **S.M. Arshad**, et al.
	Journal:	*Journal of Cardiovascular Magnetic Resonance (JCMR) 2025: 102015.*
	Link:	https://doi.org/10.1016/j.jocmr.2025.102015
2025	*Title:*	**Multi-dynamic deep image prior for cardiac MRI. |** GitHub Code Link
	Authors:	M. Vornehm, C. Chen, M.A. Sultan, **S.M. Arshad**, et al.
	Journal:	*Magnetic Resonance in Medicine (MRM) (2025): 1-12.*
	Link:	https://doi.org/10.1002/mrm.70000
2025	*Title:*	**Accelerated Real-time Cine and Flow Under In-magnet Staged Exercise.**
	Authors:	P. Chandrasekaran, C. Chen, Y. Liu, **S.M. Arshad**, et al.
	Journal:	*Journal of Cardiovascular Magnetic Resonance (JCMR) 2025: 101894.*
	Link:	https://doi.org/10.1016/j.jocmr.2025.101894
2025	*Title:*	**Achieving high heart rate with in-magnet exercise Cardiac MRI.**
	Authors:	C.D. Crabtree, J. Stoner, P. Chandrasekaran, Y. Liu, **S.M. Arshad**, et al.
	Journal:	Under revision, submitted to *Journal of Cardiovascular Magnetic Resonance (JCMR)*

Peer-reviewed Abstracts

First-authored

2026	*Title:*	**Motion-robust whole-heart 5D MRI using Expectation-Maximization-Guided Binning Correction and Outlier Rejection (EMORe)**
	Authors:	**S. M. Arshad**, L. C. Potter, P. C. Chandrasekaran, et al.
	Conference:	**Selected for upcoming** *Society for Cardiovascular Magnetic Resonance* ***(SCMR) 2026*** *Annual Scientific Sessions*, **Rio de Janeiro, Brazil.**
2025	*Title:*	**EMORe: Motion-robust XD-CMR reconstruction using Expectation-Maximization (EM) algorithm.**
	Authors:	**S. M. Arshad**, L. C. Potter, Xuan Lei, R. Ahmad
	Conference:	*Society for Cardiovascular Magnetic Resonance* ***(SCMR) 2025*** *Annual Scientific Sessions*, **Washington, DC.** Published in *Journal of Cardiovascular Magnetic Resonance, Vol. 27.*
	Link:	https://doi.org/10.1016/j.jocmr.2024.101509
2024	*Title:*	**Motion-robust 3D cine imaging using compressive recovery with outlier rejection.**
	Authors:	**S.M. Arshad**, L.C. Potter, C. Chen, et al.
	Conference:	*Society for Cardiovascular Magnetic Resonance* ***(SCMR) 2024*** *Annual Scientific Sessions*, **London, UK.** Published in *Journal of Cardiovascular Magnetic Resonance, Vol. 26.*
	Link:	https://doi.org/10.1016/j.jocmr.2024.100315
2023	*Title:*	**Motion artifact reduction in self-gated CMR 4D flow imaging under exercise stress.**
	Authors:	**S.M. Arshad**, C. Chen, Y. Liu, et al.
	Conference:	*International Society for Magnetic Resonance in Medicine* ***(ISMRM) 2023*** *Annual Meeting,* **Toronto, ON, Canada.** Published in *Proc. Intl. Soc. Mag. Reson. Med., Vol. 33.*
	Link:	https://doi.org/10.58530/2023/1087

Co-authored

2025	*Title:*	**Ferumoxytol-enhanced free-running 5D whole-heart CMR at 0.55 T.**
	Authors:	X. Sieber, P. Chandrasekaran, J. Varghese, Y. Liu, C. Roy, J. Yerly, **S.M. Arshad**, et al.
	Conference:	*Society for Cardiovascular Magnetic Resonance* ***(SCMR) 2025*** *Annual Scientific Sessions*, **Washington, DC.** Published in *Journal of Cardiovascular Magnetic Resonance, Vol. 27.*

	Link:	https://doi.org/10.1016/j.jocmr.2024.101341
2025	*Title:*	**Motion-Guided Deep Image Prior for Dynamic Cardiac MRI.**
	Authors:	M. Vornehm, C. Chen, M.A. Sultan, **S.M. Arshad**, et al.
	Conference:	*International Society for Magnetic Resonance in Medicine* ***(ISMRM) 2025*** *Annual Meeting,* **Honolulu, Hawai'i**. Published in *Proc. Intl. Soc. Mag. Reson. Med., Vol. 33.*
	Link:	https://submissions.mirasmart.com/ISMRM2025/Handlers/ViewTeaser.ashx?esbpgm=2906_120
2025	*Title:*	**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:	*International Society for Magnetic Resonance in Medicine* ***(ISMRM) 2025*** *Annual Meeting,* **Honolulu, Hawai'i**. Published in *Proc. Intl. Soc. Mag. Reson. Med., Vol. 33.*
	Link:	https://submissions.mirasmart.com/ISMRM2025/Handlers/ViewTeaser.ashx?esbpgm=9952_2770
2025	*Title:*	**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:	*International Society for Magnetic Resonance in Medicine* ***(ISMRM) 2025*** *Annual Meeting,* **Honolulu, Hawai'i**. Published in *Proc. Intl. Soc. Mag. Reson. Med., Vol. 33.*
	Link:	https://submissions.mirasmart.com/ISMRM2025/Handlers/ViewTeaser.ashx?esbpgm=37_324
2023	*Title:*	**Biventricular and hemodynamic assessment under multi-stage exercise using real-time CMR.**
	Authors:	P. Chandrasekaran, C. Chen, Y. Liu, C. Crabtree, **S.M. Arshad**, et al.
	Conference:	*International Society for Magnetic Resonance in Medicine* ***(ISMRM) 2023*** *Annual Meeting,* **Toronto, ON, Canada.** Published in *Proc. Intl. Soc. Mag. Reson. Med., Vol. 33.*
	Link:	https://doi.org/10.58530/2023/1078

INVENTIONS & PATENTS

2024	*Published Patent*	**Systems and Methods for Cardiovascular Magnetic Resonance Imaging.**
	Application#:	*WO/2024/238469*
	Link:	https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2024238469
2025	*Pending Patent:*	**Motion Robust Cardiovascular Imaging.**
	Application#:	63/663,874
	Link:	https://drive.google.com/file/d/1-YaVKiiuCUCqnJGDdj_4LqgocqfurmsG
2019	*Prototype:*	**iSight: Computer Vision & Ultrasonic Sensor based Smart Cane & Glasses for the Visually Impaired |** *Developed as senior-year capstone project*
	Recognition:	**IEEE IAS Humanitarian Project Award** at *54th IEEE Annual Meeting,* ***Baltimore, MD.***
	Link:	https://youtu.be/wlyYk-eeM3M?si=9IWfO-LSmK2pj7o1

PRESENTATIONS

Oral Presentations

2026 ***(Upcoming)*** **"Motion-robust whole-heart 5D MRI using Expectation-Maximization-Guided Binning Correction and Outlier Rejection (EMORe)."**
SCMR '26 Scientific Sessions: Image Reconstruction (including machine learning), **Rio de Janeiro, Brazil**.

2025 **"EMORe: Motion-robust free-breathing volumetric cardiovascular magnetic resonance image reconstruction using Expectation-Maximization (EM) algorithm."**
2025 Hayes Advanced Research Forum, **Columbus, OH**. | **2nd Place Award Winner**

2025 **"EMORe: Motion-robust XD-CMR reconstruction using Expectation-Maximization (EM) algorithm."**
SCMR '25 Scientific Sessions: Motion Compensation Session, **Washington, DC**.

2024	**"Motion robust 3D cine imaging using Compressive Recovery with Outlier Rejection (CORe)."** *SCMR '24 Scientific Sessions: Dealing with Motion Session*, **London, UK.**
2023	**"Motion artifact reduction in self-gated CMR 4D flow imaging under exercise stress."** *ISMRM'23: Advanced Flow & Angiography Power Pitch*, **Toronto, Canada.** | **Among top 2.7% abstracts**

Poster Presentations

2024	**"EMORe: Motion-robust XD-CMR reconstruction using Expectation-Maximization (EM) algorithm."** *Kraus Memorial Poster Competition '24,* **Columbus, OH.** | **2nd Place Award Winner**
2024	**"EMORe: Motion-robust XD-CMR reconstruction using Expectation-Maximization (EM) algorithm."** *19th Annual Research Day for the Davis Heart and Lung Research Institute (DHLRI),* **Columbus, OH.**
2023	"**Motion-robust free-running volumetric cardiovascular MRI."** *Kraus Memorial Poster Competition'23,* **Columbus, OH.**

HONORS & AWARDS

2025	Presidential Fellowship 2025-26, The Ohio State University, Columbus, OH. | Link
2025	College of Engineering Graduate Student Travel Award for spring 2026, The Ohio State University.
2025	Travel Grant from SCMR to attend the 29th Annual Scientific Sessions, Rio de Janeiro, Brazil. | Link
2025	Ray Travel Award 2025-26, The Ohio State University, Columbus, OH | Link
2025	Career Development Grant 2025-26, The Ohio State University, Columbus, OH | Link
2025	2nd Place Award, 2025 Hayes Advanced Research Forum, Columbus, OH. | Link
2025	Best Image Award, Society for Cardiovascular Magnetic Resonance Imaging, Washington, DC. | Link
2024	2nd Place Award, Kraus Memorial Poster Competition, The Ohio State University. | Link
2024	Graduate Associate Leadership Award (GALA), The Ohio State University. | Link
2019	6 Gold Medals for Academic Excellence, University of Engineering & Technology, Lahore. | Link
2019	Performance Award, Electrical Engineering Class of 2019, University of Engineering & Technology, Lahore. | Link
2019	IEEE IAS Humanitarian Project Award, 54th IEEE Annual Meeting, Baltimore, MD. | Link
2019	1st Place, DICE Virtual Innovation National Competition, Pakistan. | Link
2019	Best Project in Computer Engineering Award, Department of Electrical Engineering, University of Engineering Technology, Lahore, Pakistan. | Link
2015 – 2019	Dean's Merit Scholarship Award for all semesters, granted to the top 10 undergraduate students each semester at the University of Engineering & Technology, Lahore.
2013 – 2019	Awarded National Talent Scholarship throughout high school and undergraduate studies; granted to the top 50 students at the state level based on academic performance.

LEADERSHIP & SERVICE

2022 – 2025 ***Delegate, ECE Graduate Program, Council of Graduate Students, The Ohio State University***

- Represented the department and voiced constituent concerns at monthly council meetings.
- Organized Student Engagement Event (Apr 2023) to boost social engagement; received special recognition from ECE graduate program coordinators.

2023 – 2025 ***Chair, Housing & Family Affairs Committee, The Ohio State University***

- Successfully advocated for creation of a dedicated housing resource for graduate students by engaging university leadership and participating in the recruitment and onboarding process.
- Organized a legal guidance workshop (Nov 2023) to help students navigate tenant rights.
- Initiated a pre-arrival housing orientation for incoming international students in collaboration with the Office of International Affairs.

2023 – 2024	***General Secretary, Graduate Muslim Club (GMC), The Ohio State University*** ▪ Initiated and led 'Share Table Meetings' for monthly interfaith and cultural exchanges. ▪ Organized Eid celebration (June 2023) to foster community for students, faculty, and families celebrating away from home. ▪ Hosted two educational sessions (Apr & Sept 2023) to help international students understand and navigate the U.S. financial system.
2024 – 2025	***Mentor, Undergraduate Research Mentorship*** ▪ Supervised an undergraduate student on research spanning one academic year
2022 – 2025	***Speaker, Graduate Admissions & International Student Advocacy*** ▪ Hosted annual webinars at UET Lahore, guiding students on U.S. graduate admissions. ▪ Invited by the International Student Affairs Committee at OSU to share my journey. (March 2025)
2023 – 2024	***Judge, Career Development Grant (CDG), Ray Travel Award, and HackOHI/O*** ▪ Reviewed graduate student travel grant applications and hackathon submissions at OSU.
2023	***Outreach Presenter, COSI Science Festival*** ▪ Represented the OSU ECE department and organized interactive electrical engineering demos to spark interest among youth.
2023	***Mentor, GUIDE Peer Mentoring Program, The Ohio State University*** ▪ Provided mentorship to incoming graduate students to support their transition to graduate life.
2022	***Volunteer & Outreach Lead, Indus Hospital Fundraiser, Columbus Convention Center*** ▪ Helped raise $125,000 for flood victims in Pakistan through a fundraiser in Oct 2022 at Columbus.

REFERENCES

Prof. Rizwan Ahmad, Ph.D.—*Advisor*
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Professor, Electrical & Computer Engineering, The Ohio State University.
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