

Syed Murtaza Arshad

4th Year Ph.D. Candidate, Electrical & Computer Engineering
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EDUCATION

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| Jan 2022 – May 2025 (Expected) | Ph.D. Electrical & Computer Engineering <i>Advisors: Rizwan Ahmad, Ph.D. & Lee Potter, Ph.D.</i> 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

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

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| 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

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| 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 <i>IEEE Transactions on Medical Imaging (TMI)</i> |
| | Link: | (Preprint) https://arxiv.org/abs/2507.23224 |

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| 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: | <i>Magnetic Resonance in Medicine (MRM)</i> 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: | <i>Journal of Cardiovascular Magnetic Resonance (JCMR)</i> 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: | <i>Magnetic Resonance in Medicine (MRM)</i> (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: | <i>Journal of Cardiovascular Magnetic Resonance (JCMR)</i> 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 <i>Journal of Cardiovascular Magnetic Resonance (JCMR)</i> |

Peer-reviewed Abstracts

First-authored

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| 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 <i>Journal of Cardiovascular Magnetic Resonance</i> , 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 <i>Journal of Cardiovascular Magnetic Resonance</i> , 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 <i>Proc. Intl. Soc. Mag. Reson. Med.</i> , Vol. 33. |
| | Link: | https://doi.org/10.58530/2023/1087 |

Co-authored

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| 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 <i>Journal of Cardiovascular Magnetic Resonance</i> , Vol. 27. |

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| | 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: | <i>International Society for Magnetic Resonance in Medicine (ISMRM) 2025 Annual Meeting, Honolulu, Hawai'i.</i> Published in <i>Proc. Intl. Soc. Mag. Reson. Med.</i> , Vol. 33. |
| | Link: | https://submissions.miramsmart.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: | <i>International Society for Magnetic Resonance in Medicine (ISMRM) 2025 Annual Meeting, Honolulu, Hawai'i.</i> Published in <i>Proc. Intl. Soc. Mag. Reson. Med.</i> , Vol. 33. |
| | Link: | https://submissions.miramsmart.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: | <i>International Society for Magnetic Resonance in Medicine (ISMRM) 2025 Annual Meeting, Honolulu, Hawai'i.</i> Published in <i>Proc. Intl. Soc. Mag. Reson. Med.</i> , Vol. 33. |
| | Link: | https://submissions.miramsmart.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: | <i>International Society for Magnetic Resonance in Medicine (ISMRM) 2023 Annual Meeting, Toronto, ON, Canada.</i> Published in <i>Proc. Intl. Soc. Mag. Reson. Med.</i> , Vol. 33. |
| | Link: | https://doi.org/10.58530/2023/1078 |

INVENTIONS & PATENTS

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| 2024 | Published Patent Application#: | Systems and Methods for Cardiovascular Magnetic Resonance Imaging. WO/2024/238469 |
| | Link: | https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2024238469 |
| 2025 | Pending Patent: Application#: | Motion Robust Cardiovascular Imaging. 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

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| 2026 | (Upcoming) "Motion-robust whole-heart 5D MRI using Expectation-Maximization-Guided Binning Correction and Outlier Rejection (EMORE)." <i>SCMR '26 Scientific Sessions: Image Reconstruction (including machine learning), Rio de Janeiro, Brazil.</i> |
| 2025 | "EMORE: Motion-robust free-breathing volumetric cardiovascular magnetic resonance image reconstruction using Expectation-Maximization (EM) algorithm." <i>2025 Hayes Advanced Research Forum, Columbus, OH. 2nd Place Award Winner</i> |
| 2025 | "EMORE: Motion-robust XD-CMR reconstruction using Expectation-Maximization (EM) algorithm." <i>SCMR '25 Scientific Sessions: Motion Compensation Session, Washington, DC.</i> |

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

Poster Presentations

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

HONORS & AWARDS

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| 2025 | Presidential Fellowship 2025-2026, The Ohio State University, Columbus, OH. Link |
| 2025 | Travel Grant from SCMR to attend the 29th Annual Scientific Sessions, Rio de Janeiro, Brazil. Link |
| 2025 | Ray Travel Award 2026, 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

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| 2022 – 2025 | <i>Delegate, ECE Graduate Program, Council of Graduate Students, The Ohio State University</i> <ul style="list-style-type: none"> ▪ 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 | <i>Chair, Housing & Family Affairs Committee, The Ohio State University</i> <ul style="list-style-type: none"> ▪ 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. |

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| 2023 – 2024 | General Secretary, Graduate Muslim Club (GMC), The Ohio State University <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> Supervised an undergraduate student on research spanning one academic year |
| 2022 – 2025 | Speaker, Graduate Admissions & International Student Advocacy <ul style="list-style-type: none"> 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 HackOHIO <ul style="list-style-type: none"> Reviewed graduate student travel grant applications and hackathon submissions at OSU. |
| 2023 | Outreach Presenter, COSI Science Festival <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> Provided mentorship to incoming graduate students to support their transition to graduate life. |
| 2022 | Volunteer & Outreach Lead, Indus Hospital Fundraiser, Columbus Convention Center <ul style="list-style-type: none"> Helped raise \$125,000 for flood victims in Pakistan through a fundraiser in Oct 2022 at Columbus. |

REFERENCES

Prof. Rizwan Ahmad, Ph.D.—Advisor

Professor, Electrical & Computer Engineering and Biomedical Engineering, The Ohio State University.

Email: ahmad.46@osu.edu

Website: <https://u.osu.edu/ahmad>

Prof. Lee C. Potter, Ph.D.—Advisor

Professor, Electrical & Computer Engineering, The Ohio State University.

Email: potter.36@osu.edu

Website: <https://ece.osu.edu/people/potter.36>

Hassan Haji-Valizadeh, Ph.D.—Internship Supervisor

Manager, MR Feature Development, Canon Medical Research USA, Inc. (CMRU).

Email: hhaji@mru.medical.canon