

# CURRICULUM VITAE

## The Johns Hopkins University School of Medicine

Ajay Sharma, PhD

02/22/2026

### DEMOGRAPHIC AND PERSONAL INFORMATION

#### Current Appointments

##### University

2025-present Postdoctoral Fellow, Department of Radiology and Radiological Science, Johns Hopkins University School of Medicine, Baltimore

#### Personal Data

##### Business Address

Division of Cancer Imaging Research

Department of Radiology and Radiological Science

600 N.Wolfe Street, Room 110, MRI building, Baltimore 21287

Tel 443-740-7335

Email ashar126@jh.edu

#### Education and Training

##### Undergraduate

08/2016 Bachelor of Science (B.Sc.), University of Jammu, Jammu,  
(Mathematics, Computer Science, Physics, and Chemistry) First Class with Distinction (all semesters)

##### Doctoral/Graduate

09/2019 M.S. in Computer Application, Computer Science and Information Technology, University of Jammu, Jammu

01/2025 Ph.D. in Computer Science, Biomedical Image Analysis, Banaras Hindu University, India, Uttar Pradesh  
-Chest Imaging, Explainable Artificial Intelligence

##### Postdoctoral

04/2025- present Johns Hopkins University, Department of Radiology and Radiological Science,  
-Brain Imaging, Low-field MRI, Pediatric Brain Tumors, Foundational models

##### Other Trainings

08/2020 Indian Institute of Information Technology, Allahabad, Time Series and Longitudinal Data Analytics

04/2021 Jawaharlal Nehru University (JNU), New Delhi, High-Performance Computing

### PUBLICATIONS

#### Original Research [OR]

1. **Sharma, A.,** & Mishra, P. K. (2022). Covid-MANet: Multi-task attention network for explainable diagnosis and severity assessment of COVID-19 from CXR images. *Pattern Recognition*, 131, 108826.
2. **Sharma, A.,** & Mishra, P. K. (2024). Inception UNet architecture for breast tumor segmentation and detection using hybrid deep learning approach. *Multimedia Tools and Applications*, 1-39.
3. **Sharma, A.,** & Mishra, P. K. (2022). Image enhancement techniques on deep learning approaches for automated diagnosis of COVID-19 features using CXR images. *Multimedia Tools and Applications*, 81(29), 42649-42690.
4. **Sharma, A.,** & Mishra, P. K. (2023). DRI-UNet: dense residual-inception UNet for nuclei identification in microscopy cell images. *Neural Computing and Applications*, 35(26), 19187-19220.

5. **Sharma, A.,** & Mishra, P. K. (2022). Performance analysis of machine learning based optimized feature selection approaches for breast cancer diagnosis. *International Journal of Information Technology*, 14(4), 1949-1960.
6. Musah Toufiq, Nkwam Philip, **Sharma A.,** "Automated Pediatric Brain Hippocampal and Basal Ganglia Segmentation in Ultra-Low Field Magnetic Resonance Images". *MICCAI Challenge* on Low-Field Pediatric Brain Magnetic Resonance Image Segmentation and Quality Assurance, 2026
7. **Sharma, A.,** & Mishra, P. K. (2021, December). Deep learning approaches for automated diagnosis of covid-19 using imbalanced training cxr data. In International Conference on Advanced Network Technologies and Intelligent Computing (pp. 453-472). Cham: Springer International Publishing.
8. Girish, N., **Sharma, A.,** and Geethanath, S., "Zero-shot self-supervised super-resolution reconstruction of MRI to track brain changes using volumetry: application to high and low-field data," *SPIE Medical Imaging*, 2026.
9. **Sharma, A.,** & Geethanath, S. (2025). Learning beyond interpolation: Zero-shot resolution enhancement for low-field MRI. Accepted for presentation at the *International Society for Magnetic Resonance in Medicine (ISMRM) Annual Meeting*.
10. **Sharma, A.,** Oiye, I. E., Byrum, R., Holbrook, M., Cong, Y., Calcagno, C., Mani, V., & Geethanath, S. (2025). Enhancing low-field MRI image quality for Nipah virus infection imaging using deep learning. Accepted for presentation at the *International Society for Magnetic Resonance in Medicine (ISMRM) Annual Meeting*.
11. **Sharma, A.,** Oiye, I. E., Byrum, R., Holbrook, M., Cong, Y., Calcagno, C., Mani, V., & Geethanath, S. (2025). Physics-informed low-field Nipah virus MRI image reconstruction of non-human primates in a BSL-4 facility. Accepted for presentation at the *International Society for Magnetic Resonance in Medicine (ISMRM) Annual Meeting*.
13. Oiye, I. E., **Sharma, A.,** & Geethanath, S. (2026). Building a Low-Field MRI System in Three Days: A Hands-On Workshop. Accepted for presentation at the *International Society for Magnetic Resonance in Medicine (ISMRM) Annual Meeting*.
14. Oiye, I. E., **Sharma, A.,** & Geethanath, S. (2026). Design and optimization of a pole-less 0.2 T C-type magnet. Abstract accepted for presentation at the *International Society for Magnetic Resonance in Medicine (ISMRM) Annual Meeting*.

### Manuscript under processing [MUP]

1. **Sharma, A.,** & Mishra, P. K. (2025). A Survey on Medical Image Segmentation and Classification: The success of UNet, transfer learning, multi-scale modeling, and explainable artificial intelligence. **Neural Networks [Submitted]**
2. **Sharma, A.,** Lu, H., Greenspan, H., Lin, D. D., & Geethanath, S. (2025). Enhancing low-field magnetic resonance image quality using deep learning: Challenges, opportunities, and resources. Manuscript under revision in *NMR in Biomedicine*. **[Status: revision submitted]**
3. Oiye, I. E.\*, **Sharma, A.,** Mohanta, Z., Sankaralayam, D. S., Uchida, Y., Akinwale, T., Wang, K., Singh, A., Senapati, D. K., Ikard, L., Xu, Z., Dinh, V., Sun, Y., Shuai, Y., Ganji, S., Reilly, J., McMahon, M., Lu, H., Barker, P. B., Ross, S., Bhujwala, Z., & Geethanath, S. (2025). Building a low-field MRI system in three days: A hands-on workshop. Manuscript submitted in *NMR in Biomedicine*. **[Status: Under review]**
4. **Sharma, A.,** Ayyachamy S., Srinivasan, G., and Geethanath, S., "PEDBratsSAM: A Promptable Framework for Multimodal Pediatric Brain Tumor Segmentation," Submitted in *NMR in Biomedicine [Submitted]*.

Media (Videos, Websites, Blogs, Social Media, etc.)

LinkedIn: [linkedin.com/in/ajaysharma1996](https://www.linkedin.com/in/ajaysharma1996)

## Workshops/seminars

### Local institution/JHU

5<sup>th</sup> - 7<sup>th</sup>, May 2025,

Organizing team member for “DELTA do-it-yourself MRI” workshop on building low-field MRI, supported by the JHU Provost’s DELTA award, JHU School of Medicine, Baltimore, MD;  
Role: One of four team members

## Mentoring and advising

### Pre-doctoral Advisees/Mentees

2024 – present

Musah Toufiq, BS in Biomedical Engineering, [OR] – 1 #6  
[Ph.D. - Bostan University]

### Undergraduates Advisees/Co-mentor

2025 – 2026

Niyathi Girish, High School Student  
-Zero-shot self-supervised image enhancement.

2026 – present

Aarav Shah, Undergraduate researcher  
-Hallucination detection in AI-processed images using XAI.

## RESEARCH ACTIVITIES

### Research Focus

*Explainable AI for Medical Imaging*– I am a deep learning engineer with a broad background in biomedical image analysis. My research focuses on developing or adapting advanced deep learning methods for computer-aided disease detection and diagnosis. Currently, my work centers on improving image analysis methods for magnetic resonance imaging (MRI), with emphasis on low-field MRI (LF-MRI), image acquisition, quality enhancement, temporal brain tracking, segmentation, and reporting. The primary goal of the research is to develop clinical interpretable and generalizable methods that improve outcomes in LF-MRI and achieve performance comparable to that of high-field reference imaging. This work incorporates domain adaptation, denoising, and super-resolution reconstruction methods to enhance LF-MRI image quality and analysis. I adopted DL methods to improve the image quality of healthy human brain imaging and infectious images of Nipah virus-associated pathological changes in non-human primate MRI data. Enhanced images enable quantitative analysis of infection-related imaging biomarkers and support improved detection and characterization of the virus.

In addition, my focus is on developing advanced promptable methods using foundation models for pediatric brain tumor detection, segmentation, and characterization. My aim is to investigate the explainable framework for end-to-end image-to-reporting systems that enhance detection, segmentation, characterization, and structured reporting of pediatric brain tumor imaging.

Previously, my research focused on developing techniques for image preprocessing, classification, segmentation, and post-processing for chest image analysis. I explored Explainable AI (XAI) approaches that increase clinicians’ confidence in AI-assisted diagnostic systems. The methods are designed for near-clinical translation and are developed in line with good machine learning practices.

Additionally, my long-term goal is to investigate the use of multimodal low-resource systems, including MRI, ultrasound, and EEG, to enhance disease detection and diagnosis. Also, I am motivated to advance previously developed methods, leveraging recent advances in foundation models, explainable AI, and large language models to improve detection, interpretation, and structured reporting.

## ORGANIZATIONAL ACTIVITIES

### Journal peer review activities

2025 - Present	The Medical Image Computing and Computer-Assisted Intervention (MICCAI) Society
2025 - present	Frontiers in Neurology
2024 - Present	Nature Scientific Reports
2024 - Present	BMC Cancer
2024 - Present	Signal Image and Video Processing
2025 - Present	Biomedical Materials and Devices
2024 - Present	Biomedical Signal Processing and Control
2022 - Present	International Conference on Advanced Network technologies and Intelligent computing

### Professional Societies

2025 - present	Member, International Society for Magnetic Resonance in Medicine
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## RECOGNITION

### Awards, Honors

2026	Trainee Educational Award, 2026 ISMRM
2025	Post-doctoral Fellow award, Johns Hopkins University
2022	Senior Research Fellow Award, Banaras Hindu University, UGC India
2020	Junior Research Fellow Award (June 2020), Banaras Hindu University, UGC India
2020	UGC Non-NET Fellow, Banaras Hindu University
2020	Qualified GATE and UGC-Net Jan 2020
2019	UGC-Net Qualified for Eligibility to the Assistant Professor Position
2016	Educational Stipend, Qualified for Master of Computer Applications
2013	Educational Stipend, Awarded Post-Intermediate Fellowship for Highest Percentage in PCM (Physics, Chemistry, Mathematics)
2011	Secured Second Rank in Secondary School Examination

### Invited Talks

#### Local institution/ JH

11/07/2025	“Explainable Artificial Intelligence for Chest Imaging”, hosted by Dr. Bharath Ambale Venkatesh, Cancer Imaging Division, Dept. of Radiology and Radiological Science, at Johns Hopkins University, Baltimore, MD, USA.
04/03/2026	“Improving Access to Nipah Virus Neuroimaging Using Low-Field MRI and Super-Resolution Reconstruction”, hosted by, Dept. of Radiology and Radiological Science, at Johns Hopkins University, Cancer imaging, Baltimore, MD, USA.

## EXTRAMURAL FUNDING - N/A