

CURRICULUM VITAE

Summary Statement

I hold a Ph.D. in Biomedical Informatics from the University of Pittsburgh School of Medicine. Prior to this, I worked as a full-time Software Engineer in the telecommunication and defense sector. My research focuses on the intersection of data science and software engineering, particularly within healthcare applications. I am fascinated by the systems approach to studying medicine and have developed novel methods to facilitate computer-aided detection and predictive modeling. My doctoral work explored the use of machine learning, graph theory, and neuroimaging datasets to create explainable models that deepen our understanding of neurodevelopment and cognitive outcomes. These models aim to provide intuitive insights for clinical cases involving both typical and atypical patients.

BIOGRAPHICAL

Name:	Joy Roy	Citizenship:	USA
Affiliation:	Mayo Clinic	Website:	joyroy.org
Location:	Remote (Baltimore, MD)	E-Mail Address:	jor115@pitt.edu

EDUCATION and TRAINING

GRADUATE:

Dates Attended	Name and Location	Degree Received	Subject
2020 - 2024	University of Pittsburgh School of Medicine Pittsburgh, PA	PhD	Biomedical Informatics

UNDERGRADUATE:

Dates Attended	Name and Location	Degree Received	Subject
2015 - 2019	University of Maryland, Baltimore County Baltimore, MD	BS	Major: Bioinformatics and Computational Biology
2015 - 2019	University of Maryland, Baltimore County Baltimore, MD	BA	Major: Mathematics Minor: Computer Science

APPOINTMENTS and POSITIONS

Senior Data Scientist

Henry M Jackson Foundation

2025 - Present

Bethesda, MD

- Design, implement, and evaluate generative AI solutions to enhance clinical workflows and decision support.

Health Informatics Scientist

Henry M Jackson Foundation

2025 - 2025

Bethesda, MD

- Designed a data ingestion and storage framework to centralize blast traumatic brain injury data for machine learning applications.
- Appointed in the Department of Domestic Operations with the National Intrepid Center of Excellence at Walter Reed Hospital
- Support blast traumatic brain injury research using data and computer science.
- Active Interim DoD Secret Clearance

Pre-Doctoral Fellow

Pediatric Imaging Research Center, Children's Hospital of Pittsburgh

2020 - 2024

Pittsburgh, PA

- Collaborated with Department of Psychiatry, Radiology, and Biomedical Informatics to do high level data analyses on clinical data
- Developed, trained, and evaluated machine learning models, including Random Forests and Convolutional Neural Networks, to derive predictive insights from large medical imaging datasets.
- Automated MRI preprocessing pipelines with custom Python scripts, utilizing libraries such as FSL and NumPy to perform tasks like segmentation, registration, and data normalization.
- Developed new open source commandline software to accelerate research

Software Engineer

Hughes Network Systems

2019 - 2020

Gaithersburg, MD

- Designed and implemented real time software for protocols, algorithms, and products using C/C++
- Maintained Jenkins pipelines for automated unit testing and continuous integration and continuous development.
- Handled ITAR controlled technical data

Bioinformatics Research Assistant

Lobo Lab, University of Maryland Baltimore County

2017 - 2020

Baltimore, MD

- Developed an algorithm to encode and curate the biological data in planaria based on anatomical ontologies
- Lead a project team to develop a [software](#) tool written in C/C++ (with Qt framework) integrating this methodology with a GUI for the curation of data into a database managed in SQL

ORISE Research Fellow

Food and Drug Administration

Summer 2017

Silver Springs, MD

- Conducted research on Fc receptors and their effect on therapeutic monoclonal antibodies.
- Digested and isolated antibody fragments, used Flow Cytometry, performed Western Blot analysis, gel electrophoresis, and Mixed Lymphocyte Reactions.

HONORS

- 2024 Finalist, Biomedical Image of the Year
MRI Preprocessing Complete
University of Pittsburgh School of Medicine Biomedical Graduate Student Association
- 2023 Runner-Up, Best Student Paper of the Year, Department of Biomedical Informatics
Limbic pathway vulnerability associates with neurologic outcome in children after cardiac arrest
Resuscitation, 2023 Jan;182:109634
- 2023 Bronze Medal Focus Talk
Functional Network Organization is Atypical in Congenital Heart Disease
National Library of Medicine T15 Training Conference 2023 - Stanford University
- 2022 Runner-Up, Student Paper of the Year, Department of Biomedical Informatics
Defining telehealth for research, implementation, and equity
Journal of Medical Internet Research, 2022 Apr 13;24(4):e35037
- 2019 UMBC Faculty Award for Excellence in Bioinformatics
University of Maryland Baltimore County
- 2019 Departmental Honors in Research, Department of Biology
University of Maryland Baltimore County
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PROFESSIONAL ACTIVITIES

Seminars and Lectures

2022 UPMC Hillman Cancer Center Academy
Pittsburgh, PA
Intro to Imaging Informatics Research

Graduate School Teaching

2022 Teaching Assistant: Publication and Presentations
Department of Biomedical Informatics,
University of Pittsburgh School of Medicine, Pittsburgh, PA

Student Mentoring

2023 Jose Maldonado, CoSSBI Summer Scholar
2022 Ansh Goyal, CoSSBI Summer Scholar

Volunteering

2022-2024 Pitt DBMI Student Representative
2023 Pitt BGSA Symposium Planning Committee Member
2021-2024 Pitt BGSA Program Representative
2021-2023 Pitt BGSA Big Buddy

PRESENTATIONS

1. Roy J, Reynolds W, Wallace J, Badaly D, Ceschin R. Exploring the Impact of Network Construction Methods and Threshold Selection on Graph Analysis Outcomes. Poster presented at: Flux Society Annual Meeting; 2024; Baltimore, MD.
 2. Roy J, Reynolds W, Wallace J, Badaly D, Panigrahy A, Ceschin R. Functional network organization is locally atypical in congenital heart defect. Lecture presented at: Pittsburgh MR Physicists Monthly Seminar; 2024; Pittsburgh, PA.
 3. Roy J, Reynolds W, Frank M, Panigrahy A, Ceschin R. Functional network organization is globally atypical in congenital heart defect. Poster presented at: Flux Society Symposium; 2023; Santa Rosa, CA.
 4. Roy J, Reynolds W, Frank M, Panigrahy A, Ceschin R. Functional network organization is globally atypical in congenital heart defect. Oral presented at: NLM T15 Training Conference; 2023; Stanford University.
 5. Roy J, Ceschin R, Devine D, Panigrahy A, Fink EL. Diffusion tensor imaging as a biomarker for pediatric cardiac arrest outcomes. Poster presented at: American Medical Informatics Association Symposium; 2022; Washington, D.C.
 6. Roy J, Ceschin R, Devine D, Panigrahy A, Fink EL. Diffusion tensor imaging as a biomarker for pediatric cardiac arrest outcomes. Oral presented at: NLM T15 Training Conference; 2022; University of Buffalo School of Medicine.
 7. Roy J, Panigrahy A, Ceschin R. Evaluating brain age models in adolescents with CHD. Poster presented at: American Medical Informatics Association Symposium; 2021; San Diego, CA.
 8. Roy J, Cheung E, Bhatti J, Muneem A, Lobo D. Semi-automatic ontology curation methods for a planarian gene expression pattern database. Oral presented at: Undergraduate Research and Creative Achievement Day; 2019; University of Maryland Baltimore County.
 9. Roy J, Cheung E, Bhatti J, Muneem A, Lobo D. A software tool for the curation of planarian gene expression patterns. Oral presented at: National Symposium for Undergraduate Research; 2018; St. Jude Hospital.
 10. Roy J, Hess E, Chowdhury M, Swisher J, Feldman G. The functional capabilities of an IgG4 FC are comparable to its IgG1 analog. Poster presented at: Annual Biomedical Research Conference for Minority Students; 2017; Phoenix, AZ.
 11. Roy J, Hess E, Chowdhury M, Swisher J, Feldman G. The functional capabilities of an IgG4 FC are comparable to its IgG1 analog. Poster presented at: Food and Drug Administration Summer Research Day; 2017; Silver Springs, MD.
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PUBLICATIONS

1. Roy J. Network Analysis of Multimodal MRI to Identify Regional Associations with Neurodevelopmental Outcomes in Children with Congenital Heart Disease. 2025 Feb. Available from: <https://d-scholarship.pitt.edu/47300/>
2. Roy J, Reynolds W, Panigrahy A, and Ceschin R. Functional network organization is locally atypical in children and adolescents with congenital heart disease. medRxiv 2024 Apr :2024.04.19.24306106. DOI: [10.1101/2024.04.19.24306106](https://doi.org/10.1101/2024.04.19.24306106). Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11065028/>
3. Roy J, Jarvis JM, Schmithorst V, Lee V, Devine D, Meyers B, Munjal N, Clark RSB, Kochanek PM, Panigrahy A, Ceschin R, and Fink EL. Limbic pathway vulnerability associates with neurologic outcome in children after cardiac arrest. Resuscitation 2023 Jan; 182:109634. DOI: [10.1016/j.resuscitation.2022.10.026](https://doi.org/10.1016/j.resuscitation.2022.10.026). Available from: <https://www.sciencedirect.com/science/article/pii/S0300957222007067>
4. Roy J, Levy DR, and Senathirajah Y. Defining telehealth for research, implementation, and equity. EN. Journal of Medical Internet Research 2022 Apr; 24:e35037. DOI: [10.2196/35037](https://doi.org/10.2196/35037). Available from: <https://www.jmir.org/2022/4/e35037>
5. Roy J, Cheung E, Bhatti J, Muneem A, and Lobo D. Curation and annotation of planarian gene expression patterns with segmented reference morphologies. Bioinformatics 2020 May; 36:2881–7. DOI: [10.1093/bioinformatics/btaa023](https://doi.org/10.1093/bioinformatics/btaa023). Available from: <https://doi.org/10.1093/bioinformatics/btaa023>

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Last updated: October 12, 2025

By: Joy Roy, PhD

