Rupal Agarwal

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EDUCATION

Doctor of Philosophy (Ph.D.) — **August 2020 - May 2026 (expected)**
University of South Florida — Tampa, Florida
Major: Computer Science
Advisor: Shaun Canavan, Ph.D.

Master of Science (M.S.) — **August 2018 - May 2020**
University of South Florida — Tampa, Florida
Major: Computer Science
Master's Thesis: Classifying Emotions with EEG and Peripheral Physiological Data Using 1D Convolutional Long Short-Term Memory Neural Network
Advisor: Marvin Andujar, Ph.D.

Bachelor of Science (B.S.) — **August 2014 - May 2018**
Manipal University Jaipur — Jaipur, India
Major: Computer Science and Engineering

RESEARCH INTERESTS

Artificial Intelligence (AI), Affective Computing (AC), Brain-Computer Interfaces (BCI), and Human-Computer Interaction (HCI)

WORK EXPERIENCE

Graduate Research Associate — **August 2024 - Present**
Computer Vision and Pattern Recognition Group, University of South Florida — Tampa, Florida

Graduate Research Assistant — **January 2019 – July 2024**
Neuro-Machine Interaction Lab**,** University of South Florida — Tampa, Florida

Graduate Teaching Associate — **December 2019 – Present**
Bellini College of Artificial Intelligence, Cybersecurity and Computing, University of South Florida — Tampa, Florida

Software Developer Intern — **February 2018 – June 2018**
Knimbus Online Private Ltd. — Gurgaon, India

PUBLICATIONS

Journals

[J.2] **Agarwal, R.,** & Andujar, M. (2025). Engage Neuro Art: Improving College Students' Sustained Engagement through Painting with Brain Activity. *IEEE Transactions on Human-Machine Systems.* (Under Review, 2025).

[J.1] **Agarwal, R.**, Andujar, M., & Canavan, S. (2022). Classification of emotions using EEG activity associated with different areas of the brain. *Pattern Recognition Letters*, *162*, 71–80. **(Impact Factor: 5.1).**

Conference Papers

[C.5] **Agarwal, R.**, Hinduja, S., & Canavan, S. (2025). EnsembleIQ-Pain: Intelligent Cluster Calibration for Personalized Pain Detection. In *International Conference on Multimodal Interaction (ICMI).* ACM.

[C.4] **Agarwal, R.**, Agazzi, H., & Canavan, S. (2025, May). Context-Based Screening of Autism Risk in Children. In *2025 IEEE 19th International Conference on Automatic Face and Gesture Recognition (FG)* (pp. 1-10). IEEE.

[C.3] Lewis, T., **Agarwal, R.**, & Andujar, M. (2023, October). Distance Metric-Based Classification Comparisons for a Brain-Computer Interface Authentication. In *2023 IEEE International Conference on Systems, Man, and Cybernetics (SMC)* (pp. 4714-4719). IEEE.

[C.2] Lewis, T., **Agarwal, R.**, & Andujar, M. (2022, August). An Ethical Discussion on BCI-Based Authentication. In *International Conference on Pattern Recognition* (pp. 166-178). Cham: Springer Nature Switzerland.

[C.1] **Agarwal, R.**, & Andujar, M. (2022, June). Neuro-Voting: An Accuracy Evaluation of a P300-Based Brain-Computer Interface for Casting Votes. In *International Conference on Human-Computer Interaction* (pp. 409-419). Cham: Springer International Publishing.

Master's Thesis

[MT.1] **Agarwal, R.** (2020). Classifying Emotions with EEG and Peripheral Physiological Data Using 1D Convolutional Long Short-Term Memory Neural Network. *MS Thesis. Completed towards master's degree at University of South Florida.*

PATENTS

[P.1] **R. Agarwal,** & M. Andujar (2024, December). System of and method for predicting and/or casting a vote via brain activity. US Patent No. 12,175,801.

GRANT WRITING EXPERIENCE

Federal Grant

[F.1] Improving Attention Retention of Undergraduate/Freshmen Students with ADHD using Passive Brain Painting in an Immersive Environment, National Science Foundation, EHR Core Research, $500, 000, 2022.

White Paper

[WP.1] Retaining Attention with Brain Painting, United States Special Operations Command (USSOCOM), $485, 500, 2023.

PRESENTATIONS

[P.12] **Oral Presentation** – "Multimodal Early Autism Spectrum Disorder Classification in Children using Contextual Information", **Doctoral Consortium**, International Conference on Automatic Face and Gesture Recognition, Clearwater, FL, **May 2025**

[P.11] **Poster Presentation** – "Contextual Information Enhances Early Autism Screening with Multimodal Data in Children", **Doctoral Consortium**, International Conference on Automatic Face and Gesture Recognition, Clearwater, FL, **May 2025**

[P.10] **Paper (Oral) Presentation** – "Context-Based Screening of Autism Risk in Children", International Conference on Automatic Face and Gesture Recognition, Clearwater, FL, **May 2025**

[P.9] **Oral Presentation** – "Context-Based Classification of Autism: Current Methods, Limitations, and Future Directions, AI + X Seminar, University of South Florida, Tampa, FL, **March 2025**

[P.8] **Oral Presentation -** "Brain-Controlled Drones", Kadoka Academy, St. Petersburg, FL, **November 2023**

[P.7] **Oral Presentation -** "Brain-Controlled Drones", Cybersecurity Bootcamp, University of South Florida, Tampa, FL, **July 2023**

[P.6] **Oral Presentation -** "Introduction to Brain-Computer Interfaces and Emotiv", Neuro-Machine Interaction Lab Tour, University of South Florida, Tampa, FL, **March 2023**

[P.5] **Oral Presentation** – "Introduction to Brain-Computer Interfaces and Emotiv", SHPE Hackabull Workshop, University of South Florida, Tampa, FL, **March 2023**

[P.4] **Oral Presentation** – "Attention Retention Using Brain Painting", Human-Computer Interaction Course, University of South Florida, Tampa, FL, **November 2022**

[P.3] **Oral Presentation** – "Attention Retention Using Brain Painting", AI + X seminar, University of South Florida, Tampa, FL, **October 2022**

[P.2] **Paper (Oral) Presentation** – "Neuro-Voting: An Accuracy Evaluation of a P300-Based Brain-Computer Interface for Casting Votes", International Conference on Human-Computer Interaction, Virtual, **June 2022**

[P.1] **Poster Presentation -** "Exploring the Use of Brain-Painting to Increase Attention Retention in College Students", USF Health Research Day Competition, University of South Florida, Tampa, FL, **February 2022**

AWARDS

TechConnect | Defense Innovation Award **- "**An Artistic Neurotechnology to Improve Mental Health" November 2022
Scholarship, ACM Tapia Conference September 2022
Scholarship, Grace Hopper Conference September 2021

LEADERSHIP EXPERIENCE

Simulation Project Mentor January 2023
Neuro-Machine Interaction Lab**,** University of South Florida Tampa, FL

- Mentored and supervised an undergraduate student for their project towards the Goldwater Scholarship 2023

Neuro-Drone Project Team Leader March 2021
Neuro-Machine Interaction Lab**,** University of South Florida Tampa, FL

- Project designer for Neuro-Drone project development using Enobio device for motor-imagery-based control
- Provided technical expertise as advisor for Neuro-Drone project development to control drones using motor imagery commands and artificial intelligence

Brain-Drone Simulation Project Team Leader February 2021
Neuro-Machine Interaction Lab**,** University of South Florida Tampa, FL

- Managed and supervised masters and undergraduate students for Brain-Drone Simulation project development
- Assigned weekly tasks related to the project and coordinated their activities to ensure successful completion of the projects

SERVICE AND COMMUNITY INVOLVEMENT

Conference Papers Reviewing
ACII - International Conference on Affective Computing and Intelligent Interaction 2025
FG Demo – International Conference on Automatic Face and Gesture Recognition 2025
IEEE SMC – International Conference on Systems, Man, and Cybernetics 2024 and 2023
CHI Late Breaking Work – Conference on Human Factors in Computer Systems 2023

Program Committee
ACII - International Conference on Affective Computing and Intelligent Interaction 2025

AMAR - Third Workshop on Applied Multimodal Affect Recognition – ICPR 2022

Demonstrations

Kadoka Academy, "Brain-Controlled Drones Demo", St. Petersburg, FL November 2023
Wiregrass Elementary School, "Flying Drones with Brains," Drone Simulation Showcase, Wesley Chapel, FL October 2022

Volunteering

USF Brain Drone Race, University of South Florida, Tampa, FL February 2019
Sambal India, Non-Profit Organization, Noida, India January 2017

MEMBERSHIPS

National Academy of Inventors (NAI) 2025
Association for Computing Machinery (ACM) 2022 - Present
Institute of Electrical and Electronics Engineers (IEEE) 2023 - Present

SELECTED PRESS RELEASE

Brain Painting

[Tampa Bay Times] "Can 'brain painting' help ADHD patients? USF looks for answers", (07/09/2022)
Link: https://www.tampabay.com/news/health/2022/07/06/can-brain-painting-help-adhd-patients-usf-looks-for-answers

[Yahoo News] "Can 'brain painting' help ADHD patients? USF looks for answers", (07/06/2022)
Link: https://news.yahoo.com/brain-painting-help-adhd-patients-093000135.html

[Fox 13 Tampa Bay] "ADHD treatment using virtual reality", (06/06/2022)
Link: https://www.fox13news.com/news/usf-professor-uses-brain-painting-to-help-treat-those-with-adhd-through-abstract-art

[USF Newsroom] "New brain-painting method developed at USF being tested for ADHD treatment", (05/20/2022)
Link: https://www.usf.edu/news/2022/new-brain-painting-method-developed-at-usf-being-tested-for-adhd-treatment.aspx