

ARCHISMAN BHATTACHARJEE

Bangalore, India

Experience

Verda (*verda.ai*) **Mar 2024 – Present**
Founding ML Researcher *Remote*

- Developed the watermarking model suite across three modalities — image (Monet), video (Pompeii), and audio (Bach) — taking each from scratch to state-of-the-art performance against leading industry systems.
- Designed the watermarks to embed imperceptibly and survive the compression and re-encoding platforms apply at upload, so that marked media remains attributable to a signed provenance record.
- Drive the company's ML technical decisions, from model architecture to evaluation methodology.

Independent Research Collaboration **Jan 2026 – Present**
Research Collaborator *Remote*

- Working with researchers affiliated with Stanford, Berkeley, and USC to improve how vision-language models (VLMs) interpret mathematical diagrams such as commutative diagrams and Markov chains, a longstanding weakness of VLMs.

Indian Space Research Organization (*through Indian Institute of Science*) **Apr 2024 – May 2025**
Project Associate *Bangalore, India*

- Worked on mapping elemental abundances on the lunar surface using Chandrayaan-2 CLASS data, applying deep learning for feature extraction and unmixing without ground-truth labels while disentangling solar flare variability effects to detect subtle compositional signatures.
- Built a fully automated data pipeline using Selenium (Python), reducing manual data collection efforts and saving over 12,000 human-hours.

Indian Institute of Science **Jun 2023 – May 2025**
Project Associate — Supervisor: Dr Pawan Bharadwaj *Bangalore, India*

- Extended previous SymAE research through systematic evaluation on six benchmark hyperspectral datasets, implementing and comparing against 15+ contemporary classification methods.
- Demonstrated superior generalization in real-world settings with geographically separated training and test regions.
- Investigated applications of neural codec principles from audio processing to seismological data analysis, exploring unsupervised representation learning approaches for geophysical signals.

Indian Institute of Science **Jun 2022 – Dec 2022**
Research Intern — Supervisor: Dr Pawan Bharadwaj *Bangalore, India*

- Developed Symmetric Autoencoder (SymAE) for hyperspectral imaging to disentangle class-invariant spectral features from unmodeled nuisance variations, using spatial correlations for unsupervised feature extraction without ground truth.
- Based on this research, authored master's thesis receiving highest score in cohort.

Education

Indian Institute of Technology (ISM) Dhanbad **Jul 2018 – Jun 2023**
Integrated Master of Technology in Applied Geophysics *Dhanbad, India*

Publications

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- **Archisman Bhattacharjee** and Pawan Bharadwaj. "Coherent Spectral Feature Extraction Using Symmetric Autoencoders." Published in IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing. DOI: 10.1109/JSTARS.2025.3533302. Preprint available at arXiv:2309.14286.

Conferences & Presentations

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- **Poster Presentation:** "Disentangling Nuisance Features in Hyperspectral Images using Symmetric Autoencoders" at the 34th Conference on Mathematical Geophysics (CMG) 2024, Mumbai.
 - **Poster Presentation:** "Quantizing Quakes: Exploring Neural Codecs for Earthquake Signal Analysis" at the Conference on Applied AI and Scientific Machine Learning (CASML) 2024, Bangalore.

Projects

Distributed Deep Learning | *Distributed System Research, PyTorch* **Jan 2024**

- Led a project to distribute training and inference of large models across multiple computers and GPU resources. Deployed LLaMA-13B across two devices using the Petals framework, and used Hivemind to train ResNet-18 across three systems over the internet.

Modeling Contributions of Forcing Factors in Global Temperature Change | *Climate Science, Python* **Feb 2022**

- Modeled the individual contributions of forcing factors like CO₂, SO_x, and solar anomalies to global average temperature using moving window linear regression, providing insights into temporal variation in climate impact.

Stochastic Modeling and Quantitative Finance Tools in Python | *Monte-Carlo Simulations, Portfolio Risk* **Oct 2021**

- Implemented a range of stochastic models, including Monte-Carlo simulations for option pricing, VaR, and stock price modeling. Created tools for portfolio optimization and risk analysis using Geometric Brownian Motion and other stochastic processes.

PPT Hut | *Entrepreneurship, WordPress*

Jun 2021 – May 2022

- Co-founded and managed ppthut.com, a website specializing in designing PowerPoint presentations and graphics. Focused on SEO and website optimization.
- Assisted teachers in enhancing presentations, gaining skills in user-focused design and online marketing techniques.

Technical Skills

Languages & Frameworks : Python, PyTorch; prior experience in Julia (Flux.jl), MATLAB, C, C++, Java

Domains : Media watermarking & content provenance, generative models, representation learning, audio/image/video ML; earlier work in hyperspectral remote sensing and geophysical signal analysis

Workflow : AI-assisted research & engineering, directing agentic coding tools and reviewing model implementations for mathematical correctness; LaTeX

Certifications

- Quantitative Finance and Algorithmic Trading in Python - Udemy
- Competitive Strategy - LMU Munich (Coursera)
- Advanced Competitive Strategy - LMU Munich (Coursera)
- Android O & Java - Udemy

Workshops

Optiver FutureFocus | *Organized by Optiver APAC*

Sep 2021

- Selected to attend the FutureFocus program, gaining exposure to market making, quantitative trading, research, and development.

Leadership / Extracurricular

Quiz Club IIT ISM

Aug 2018 – May 2023

Core Member

- Hosted numerous quizzes, including Terra'Stellar series, which saw record participation. Won multiple quiz competitions across India.

ARKA - Astronomy Club of IIT ISM

Nov 2018 – May 2021

Member

- Presented a session on 'Astronomy Behind Calendars' and organized a quiz for inducting new members. Assisted in recruiting new club members.

Association of Exploration Geophysicists

Jun 2022 – May 2023

Vice-President

- Led the student chapter, organized events, and presented an introduction to AEG during the induction of new members.

Achievements

- Ranked among the top 10 winners out of 5,261 participants nationwide in the Accenture Strategy Connect 2021 business strategy simulation.
- Secured 1st place for presenting on 'Neutrino Geophysics' at Geoconfluence 2020 symposium, among 63 participants.
- Runner-up in the Science of Paper Folding mathematics competition at the National Students' Space Challenge 2019, IIT Kharagpur.
- Achieved 1st rank in the district and 5th in the state of Assam in the 14th National Science Olympiad.
- Represented the college at Inter-IIT cultural meets in 2018 and 2019.
- Won multiple quiz events at college fests across India, including Concetto, Srijan, Rhapsody, and UTPT.
- Earned a Silver Medal in Table Tennis at the General Sports Championships at IIT ISM.
- Ranked in the top 1% out of 11.48 million candidates in the IIT Joint Entrance Examination 2018.