

ASHVAJEET ATHAWALE

B.Tech 4th Year | Malviya National Institute of Technology, Jaipur

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EDUCATION

B.Tech in Electronics & Communication Engineering

Nov 2022 – May 2026 (Expected)

Malviya National Institute of Technology, Jaipur

Relevant Coursework: Neural Network, Deep Learning (Coursera), Computer Vision, Image Processing, React.js with Redux Toolkit (Udemy)

- **Class XII (CBSE, Mar 2021):** Scored 92% (Ranked 2nd out of 80 students).
- **Class X (CBSE, Mar 2019):** Scored 86.7%.

PUBLICATIONS & PATENTS

- **System and Method for Real-Time Neural Data Analysis** Aug 2025
 - **Patent Filed:** Co-authored and filed an invention patent named as "Multi-Band electromagnetic burst analyzer and polyatomic time-crystal processor". (*Status: Pending*)
 - **Research Paper:** Co-authored paper "Beyond Conventional EEG: High-Frequency Circuits Design and Brain Data Visualization for DDG device," in preparation for submission to Journal of Applied Physics.

WORK EXPERIENCE

- **Research Intern** May 2025 - Jul 2025
IIT Mandi
 - Engineered a multithreaded C++ application to process a 10Gbps data stream from 168 channels, accelerating FFT computations by 4x with the FFTW3 library.
 - Secured a thread-safe I/O system using mutex locks, guaranteeing zero data loss between the C++ core and a Next.js backend processing over 100,000 data points per second.
 - Delivered a real-time Next.js dashboard rendering 4 complex neural visualizations concurrently (12 Frequency bands, Time phasing, Poly atomic time crystal, instantaneous phase window).
 - Constructed a full-stack, test-ready prototype that integrated 3 custom hardware components, cutting the end-to-end signal-to-visualization pipeline time by 30%.
- **Full Stack Developer Intern** May 2024 - Dec 2024
Per Clean Laundry Services
 - Engineered different APIs, including a React.js report generation module, optimized query handling, OTP verification and whatsapp notification, and backend for 30+ APIs, with advanced logger debugging system
 - Developed a custom unit testing framework from scratch using Node.js, without using external libraries, and developed the LLD document solution for all orders fetching improving latency of 40%.

PROJECTS

- **Automated Neural State Classification from DDG Visualizations** Aug 2024
 - Developed a Computer Vision model using OpenCV and TensorFlow to classify neural states from 4 distinct real-time visualizations, processing data stream from 168 channels.
 - Automated the analysis process, reducing pattern identification time by over 90% compared to manual analysis and enabling more efficient quantification of neural activity.
- **New Hierarchical Transformer Attention Model** Jun 2024
 - Devised a hierarchical attention model with staged memory tokens to cut computational complexity from $O(n^2)$ to $O(n)$, enabling a 10,000-token sequence length on a single 4GB GPU.
 - Validated the architecture to achieve a 40% reduction in GPU training time and a 2.5x increase in long-context retention compared to standard transformer models.

SKILLS

- **AI & Computer Vision:** Machine Learning, Deep Learning, Computer Vision, Image Processing
- **Libraries & Frameworks:** OpenCV, TensorFlow, PyTorch, Pandas, NumPy, Matplotlib, Jest
- **Programming:** Python, C++, JavaScript, TypeScript, SQL
- **Developer Tools:** Git, GitHub, Docker, Postman, Google colab, MongoDB compass
- **Services:** AWS (Lambda, EC2, SNS), Google Cloud, Twilio, Logger

POSITION OF RESPONSIBILITY

- **General Secretary:** Classical Music and Dance Club, MNIT Jaipur
- **Joint Secretary:** Aeromodelling Club, MNIT Jaipur