

ATHARVA HUDLIKAR

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EDUCATION

Nanyang Technological University, Singapore

Aug 2023 – Jul 2025

Master of Science (MSc) in Computer Control and Automation

Vellore Institute of Technology (VIT), Vellore

Jul 2017 – Jun 2021

Bachelor of Technology (B.Tech) in Electrical and Electronics Engineering

WORK EXPERIENCE

AI Research Fellow

May 2024 – Present

Tan Tock Seng Hospital – PROTON Research Programme

Singapore

- Lead AI research and production ML initiatives spanning **LLM/RAG systems, multimodal AI, and clinical deployment**, defining system architecture, technical direction, and implementation priorities across the team.
- Lead development across interns and research staff, translating research objectives into production-oriented engineering tasks and coordinating delivery across projects with varying technical complexity.
- **Deployed Vision Transformer models into clinical workflows**, analyzing model performance and failure modes to improve production reliability while **reducing infrastructure costs by 40%**.
- **Designed and built an end-to-end RAG platform** covering document parsing, embedding generation, retrieval, and ranking, enabling real-time knowledge access across **50+ global research teams**.
- Built multimodal and agentic AI infrastructure integrating **vision, structured data, and multiple specialized AI models** for clinical research and decision-support workflows.

AI Product Engineer

Jun 2021 – Apr 2023

Goalist India Technologies Pvt. Ltd.

Bangalore, India / Tokyo, Japan

- Developed and fine-tuned **LLM and ML systems** for enterprise workflows, aligning model behavior with business requirements and improving downstream decision-making through iterative evaluation and error analysis.
- Built an end-to-end **information retrieval and resume parsing platform**, optimizing entity extraction and ranking pipelines for high-relevance search across multilingual Japanese-language data.
- **Led a team of 3 engineers** in developing a full-stack AI application, defining system architecture and integrating ML services into production user-facing workflows.
- Partnered directly with product and business stakeholders to translate ambiguous requirements into **production-ready AI systems**, driving technical decisions and improving system reliability across client-facing deployments.

INTERNSHIP EXPERIENCE

AI Engineer (Intern)

Dec 2019 – Dec 2020

MellonAI

Chennai, India

- Led development of **3 AI-driven healthcare systems**, including head pose estimation, facial recognition, and emotion detection models using custom datasets.
- Deployed production-ready computer vision systems adopted by partner hospitals, **reducing operational waiting time by 20%**.
- Designed data pipelines for preprocessing, feature extraction, model training, and evaluation across healthcare datasets.

Computer Vision Engineer (Intern)

May 2019 – Jul 2019

Alpha ICT LLP

Pune, India

- Built end-to-end **OCR and Automatic License Plate Recognition (ALPR)** systems using CNN-based architectures and custom image preprocessing pipelines.
- Automated manual identification workflows, **reducing annual operational costs by approximately 80%**.

SELECTED PROJECTS

Agentic RAG

- Built a deployment-grade **RAG system** with custom document parsing, embedding, retrieval, and ranking pipelines for domain-specific question answering.
- Developed an agentic orchestration layer that dynamically selects specialized AI models for medical analysis based on available literature, task requirements, and model capabilities.
- Integrated action-oriented capabilities beyond question answering, enabling agents to interact with underlying data and systems to complete multi-step tasks.

Generative AI-based Robot Control

- Designed a multimodal AI pipeline integrating **vision, depth estimation, and generative models** for robotic control in dynamic environments.
- Explored diffusion and neural rendering approaches for structured decision-making, bridging perception and downstream robot action.
- Evaluated system-level behavior across perception and control components to improve robustness and reliability of downstream actions.

Medical Image Generation

- Developed **Diffusion and StyleGAN-based generative models** for ophthalmological imaging, including OCT and fundus images.
- Trained generative models from scratch and fine-tuned pretrained models to compare synthetic image quality and downstream utility.
- Generated synthetic datasets for training classification models targeting rare ophthalmological diseases.

PUBLICATIONS

1. Cifuentes-González, C., Gutiérrez-Sinisterra, L., Rojas-Carabali, W., Boon, J., **Hudlikar, A.**, et al. “Novel Artificial Intelligence–Based Quantification of Anterior Chamber Inflammation Using Vision Transformers.” *Translational Vision Science & Technology*, 14(5), 31, 2025. [doi:10.1167/tvst.14.5.31](https://doi.org/10.1167/tvst.14.5.31).
2. Hsu, J., D’Cunha, R. L., Choi, A., Zhu, M., Haystead, A., **Hudlikar, A.**, et al. “Retinal Vascularity Index in Parkinson’s Disease vs Controls.” *Investigative Ophthalmology & Visual Science*, 67(7), 3582, 2026.
3. Menon, U. M., Menon, A. R., **Hudlikar, A.**, et al. “A Novel Chaotic System for Text Encryption Optimized with Genetic Algorithm.” *International Journal of Advanced Computer Science and Applications*, 11(10), 2020. [doi:10.14569/IJACSA.2020.0](https://doi.org/10.14569/IJACSA.2020.0)
4. Menon, U., **Hudlikar, A.**, & Panda, D. “Scytale – An Evolutionary Cryptosystem.” *International Journal of Computer Science and Network*, 9(4), 153–159, 2020. [arXiv:2008.05290](https://arxiv.org/abs/2008.05290).
5. Menon, U., Menon, A. R., **Hudlikar, A.**, Sharmila, A., & Mahalakshmi, P. “A Hybrid Autoencoder Architecture for Text Encryption.” *2021 Innovations in Power and Advanced Computing Technologies (i-PACT)*, 2021, pp. 1–7. [doi:10.1109/i-PACT52855.2021.9696715](https://doi.org/10.1109/i-PACT52855.2021.9696715).

TECHNICAL SKILLS

- **LLM / GenAI**: RAG, LLM Fine-Tuning, Embeddings, Reranking, Agentic Systems, Prompt Engineering, LLM Evaluation, Error Analysis
- **ML / Deep Learning**: PyTorch, TensorFlow, Vision Transformers, Diffusion Models, Computer Vision
- **ML Infrastructure**: AWS, Docker, Microservices, CI/CD, Model Deployment, MLOPs, Production Optimization
- **Programming**: Python, C/C++, TypeScript/JavaScript, Java, Go