

Chealyfey Vutha

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EDUCATION

Brown University, M.S. Computer Science

Providence, RI | **Expected Graduation May 2027**

Fort Hays State University, B.S. Computer Science, 4.0/4.0 GPA

Hays, KS | **May 2024**

Relevant Courses: Deep Learning, Machine Learning, Software Engineering, Computer Graphics, Operating Systems, Data Structures

WORK EXPERIENCE

Brown University (Visual Computing Lab)

Graduate Research Assistant (Advisor: Prof. Daniel Ritchie)

Providence, RI

Sep 2025 – Present

- Conducting research at the intersection of neuro-symbolic AI and procedural modeling, investigating how algorithmic priors can bootstrap deep generative networks in low-data regimes.
- Analyzing state-of-the-art literature in neural rendering and program induction to guide the lab's experimental strategy for automating content creation in under-represented domains.
- Formulating novel frameworks for structure-aware 3D synthesis, aiming to extend diffusion-based architectures to handle complex cultural topologies without massive datasets.

Ministry of Post and Telecommunications

Phnom Penh, Cambodia

AI Engineer

Jan 2025 – Aug 2025

- Architected and deployed a real-time Khmer-English speech-to-speech Telegram bot; integrated OpenAI's Whisper automatic speech recognition model and Coqui text-to-speech model to achieve **<1s latency** for government services.
- Led model optimization efforts by distilling the NLLB-200 model from **600M to 350M parameters**, maintaining translation quality (38.83 chrF) while reducing inference costs.
- Managed a data quality initiative, leading **30 volunteers** to validate a **150k-sentence** Khmer-English parallel corpus, directly improving model accuracy.

National University of Singapore

Singapore, Singapore

Student Researcher (Advisor: Prof. Norman Vasu)

Jun 2023 – Nov 2024

- Secured a **\$5,000 SGD** competitive grant to lead a 6-person team in developing a digital heritage archiving application.
- Designed and launched the mobile MVP using Flutter and presented research outcomes to **150+** regional experts at the Asian Undergraduate Symposium.

CMKL University (Carnegie Mellon Thailand)

Bangkok, Thailand

Software Development Intern (Advisor: Prof. Sally E. Goldin)

Oct 2023 – Dec 2023

- Engineered RESTful endpoints for the *AICE* Admin Backend in Go (Echo), enabling administrators to manage the full lifecycle of student curriculum versions and historical data adoption.
- Automated student curriculum versioning by engineering high-throughput batch processing pipelines, reducing manual data entry time by **95%** and handling row-level validation.
- Resolved complex serialization issues (JSON vs. Multipart/Form-Data) and authenticated administrative sessions via JWT, validating system integrity through Postman suites and CI/CD integration.

RESEARCH EXPERIENCE

Smooth Multi-Object Interpolation via Latent Density Geodesics

Providence, RI | Dec 2025 – Present

- Developing a robust boundary value problem (BVP) solver with novel energy constraints to preserve object identity and enforce smoothness during complex latent space interpolations.
- Experimenting with alternative ODE integration schemes to mitigate artifacts in high-density pathfinding, aiming to establish a new benchmark for multi-subject image morphing.

3D Shape Generation Through Voxel Diffusion [\[GitHub\]](#)

Providence, RI | Sep 2025 – Nov 2025

- Built and trained a 3D Denoising Diffusion Probabilistic Model (DDPM) using a U-Net backbone with time-embedded 3D convolutions to generate high-fidelity 64^3 voxel grids.
- Engineered a procedural synthetic data pipeline to solve data scarcity, generating 1,000+ training samples via cubic interpolation and affine transformations.
- Stabilized training and eliminated mode collapse by implementing noise ramp scheduling and custom loss rebalancing, achieving convergence over 2,000 epochs.

SKILLS & INTERESTS

Certifications: AWS Certified Machine Learning Engineer - Associate, AWS Certified AI Practitioner

Technical Skills: Python, Tensorflow, Pytorch, Amazon Web Services, Docker, Git, Go, C++