Gautham Krishnan Priya

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Education

Bachelor of Technology in Computer Science - Artificial Intelligence 2021 - 2025
Amrita Vishwa Vidyapeetham, Amritapuri — CGPA: 8.48 *Kerala, India*
Relevant courses: Machine Learning, Deep Learning, Linear Algebra, Operating Systems, Data Structures and Algorithms
Undergrad Thesis: Hierarchical Deep Learning Architecture for Real-Time Diagnosis of Pancreatic Cancer from Endoscopic Ultrasound Videos

Experience

MAITRI Labs (Healthcare AI Research Division, Amrita Hospitals) May 2023 – Present
Student Researcher → Research Engineer | PyTorch, MONAI, PyTorch Lightning, WandB, Hydra, AWS *Kerala, India*

- Developed a novel CNN–Transformer–MIL architecture for real-time (<50 ms), patient-level pancreatic cancer detection from endoscopic ultrasound videos, and co-invented the resulting patent application.
- Built 3D Slicer MCP, an open-source Model Context Protocol server that lets AI agents operate 3D Slicer for slice navigation, 3D viewing, anatomy display and reporting.
- Built CHD-Bench, the first model-agnostic benchmark and harness that lets multimodal LLM agents diagnose congenital heart disease by interactively examining cardiac CT in 3D Slicer. The best agent reached an F1 of 0.65, beating all other evaluated methods.
- Implemented model ensemble-based uncertainty quantification, improving classification accuracy from 74% to 85%.
- Built versioned preprocessing pipelines for 350+ GB of EUS video from ongoing clinical procedures, and trained large-scale models on HPC clusters using Slurm.
- Integrated Hydra and PyTorch Lightning for reproducible training, improved the team's W&B experiment tracking, and maintained AWS Lambda/DynamoDB data collection infrastructure.
- Mentored junior researchers on medical-AI tooling, literature review and large codebases.

Google Summer of Code, DeepChem May 2024 – August 2024
Contributor | PyTorch, TensorFlow, Pytest | Report *Remote*
DeepChem is a Python library for machine learning and deep learning on molecular and quantum datasets.

- Integrated support for `torch.compile()` into the library, achieving up to 21% faster inference and 18% faster training speeds for select DeepChem PyTorch models through optimized model compilation.
- Authored a comprehensive tutorial on compiling DeepChem models effectively and benchmarking their computational performance for optimal utilization.
- Profiled the training loop of DeepChem PyTorch models to identify key bottlenecks and proposed optimizations to enhance training efficiency and performance.
- Ported the implementation of the ProgressiveMultiTask model from TensorFlow to PyTorch including unit tests and documentation prior to Google Summer of Code.

Patents & Publications

[1] **Patent (pending):** G. Gressel, P. Nair, A. Ramesh, **G. K. Priya**, A. Swain. "AI-Assisted Endoscopic Ultrasound System and Method for Pancreatic Abnormality Detection." *Indian Patent Application No. 202541034844*, filed April 2025, published April 2026.

[2] **Challenge paper:** A. Swain, **G. K. Priya**, A. Vijesh. "Towards a Generalist Ultrasound Foundation Model via Task-Adaptive Multi-Task Learning." *Foundation Model Challenge for Ultrasound Image Analysis (FMC UIA), ISBI*, 2026. Paper

[3] **Journal (under review): G. K. Priya**, A. Swain, A. Kaimal, …, G. Gressel, P. Nair. "Automated Patient-Level Pancreatic Ductal Adenocarcinoma Detection from B-Mode EUS Video: A Retrospective Diagnostic Accuracy Study." *Endoscopic Ultrasound*, 2026.

Achievements & Open Source

Global ranking 7 for ISBI Foundation Model Challenge for Ultrasound Image Analysis January 2026
Team Lead | *MONAI, PyTorch, WandB* | *Certificate* | *Paper*

- Trained multitask foundation model supporting segmentation, classification, detection, and regression on 22 open-source ultrasound datasets
- Added functionalities for data augmentation, data loading, metrics logging and experiment tracking.

Medical Open Network for AI (MONAI) December 2025 – Present
Open Source Contributor | *MONAI, PyTorch, Hugging Face* *Remote*

MONAI is a widely used PyTorch-based, open-source framework for deep learning in healthcare imaging.

- Built a unified evaluation pipeline for the MONAI Ultrasound Working Group that benchmarks arbitrary model–dataset combinations through a common interface, replacing per-model ad hoc scripts.
- Benchmarked 3 open-source text-promptable segmentation foundation models across 13 public ultrasound datasets (11 anatomies, 120k+ images), producing the working group's reference comparison of out-of-the-box generalization.
- Created and maintain a unified repository aggregating public ultrasound datasets in a standardized format, enabling reproducible evaluation across heterogeneous data sources.

Leadership Experience

Member and Mentor December 2021 - August 2025
amFOSS - Amritapuri Free and Open Source Software Club *Kerala, India*

amFOSS is a leading open-source and Computer Science club in India, dedicated to fostering innovation and open-source contributions.

- Mentored 20+ students, guiding them in contributing to open-source projects and participating in hackathons and meetups.
- Organized Hacktoberfest 2022&23 and conducted a month-long programming workshop for freshmen students, enhancing their coding skills.
- Led the content team responsible for creating and managing content for the club's social media platforms and blogs.

Team Lead December 2023
SSR - Student Social Responsibility *Kerala, India*

SSR is a community outreach program where students form teams and conduct various events that positively affect society.

- Designed and executed a hands-on hardware programming workshop that introduced 25+ middle school students to Arduino programming, sensors, and basic electronics.
- Developed comprehensive learning materials and provided one-on-one mentorship to 5 students, enabling them to successfully complete their project using the provided sensors.

Technical Skills

Programming Languages: Python, Dart, C++, C
Machine Learning: PyTorch, PyTorch Lightning, MONAI, TensorFlow, scikit-learn, Weights & Biases
Scientific Computing: NumPy, Pandas, OpenCV, Matplotlib
Web Technologies: React, JavaScript, Flask, Django
Cloud & DevOps: AWS (S3, DynamoDB, Lambda), Slurm, Docker
Other: Git, Linux, Hydra, Pytest, PyQt