Dhanush Kovi

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EDUCATION

Amrita Vishwa Vidyapeetham June 2025
B.Tech. in Computer Science and Engineering (Artificial Intelligence) *Coimbatore, India*

- **GPA: 7.72/10.0**
- **Relevant Coursework:** Deep Learning, Reinforcement Learning, Full Stack Development, NLP.

WORK EXPERIENCE

Genix AI Healthcare June 2025 – July 2025
Web Developer Intern *Remote*

- Architected a multi-server Nuxt.js application for workflow automation, using Tailwind CSS to prioritize UX and automating UI interactions to ensure full accessibility for users relying on screen readers.
- Integrated a dedicated MCP backend in Python securely via server middleware, eliminating a class of security vulnerabilities and improving overall data processing efficiency by 60%.

SOFTWARE PROJECTS

dkvc.org

- A personal website built with 14+ custom Vue components; animated > 90% of UI for fluid experience.
- Ensured 100% keyboard navigability & screen reader compatibility; achieved 98% Lighthouse accessibility.

Ifpshare Downloader

- Cut download/archival time for previously inaccessible visual content from 5-20 mins to <15 seconds, resolving critical user accessibility issue.
- Automated a multi-step read-only image download into a single-click PDF consolidation operation using API.

Comparing PINNs vs PIKANs for fluid-flow problems

- Investigated novel Physics-Informed Kolmogorov-Arnold Networks (based on KANs, est. 2024) against established PINNs for solving partial differential equations (PDEs).
- Showcased PIKANs' superior accuracy with 50-75% less data and smaller architecture; cut VRAM usage from 16GB to ~2-3GB.
- Achieved 10x fewer epochs & ~10% less wall-clock training time for PIKANs in complex simulations.

Hierarchical Actor-Critic RL for Improved Text Summarization

- Summarizes large amount of data by decomposing it into high-level objectives and low-level detailed summary.
- Achieved effective summarization (~0.52 ROUGE-1) & high sample efficiency via 100-episode model convergence.

Dynamic Vehicle Routing Optimization Platform with Data-Driven Solver

- Designed dynamic web visualizations to analyze Capacitated Vehicle Routing Problem with Time Windows (CVRPTW) solutions derived from genetic algorithms using D3.js & Flask.
- Structured and cached frequently used data visualizations and analysis using PostgreSQL and scripted data migrations to manage 50+ solutions at a same time.

3D Space Shooter Webgame for Thin Clients

- Developed a space shooter gameplay with a mini-physics engine for running large physics simulations on thin client systems.
- Reduced bandwidth usage by 85%, decreasing the total bandwidth for an average number of active players per room from 200 MB to less than 30 MB.
- Engineered a manual physics engine handling 80% of interactions client-side, reducing server-side computational load by ~24%.

Warfarin Dosage Prediction using Ensemble Sampling

- Improved prediction time of Warfarin Dosage by 50% using ensemble of models compared to other sampling methods on large datasets
- Optimized model performance to handle datasets 20x larger with lower time complexity.

Hate Speech Detection with LSTM and LSTM-PSO

- Enhanced low frequency classes (recall +0.21 increase, AUC: +0.17 increase) by tuning LSTM with Particle Swarm Optimization (PSO).
- Attained 87.09% accuracy (+4.7% increase) with multi-lingual data across 50+ languages compared to LSTM.

Brain MRI Segmentation using U-Net and U-Net Attention

- Achieved 85% mean IoU (+3% increase) by integrating attention mechanism to U-Net without negligible performance overhead.
- Enhanced delineation of challenging tumor boundaries and complex structures by integrating attention gates.

gpkgstatus (Get Package Status)

- Published a CLI to check the current status of packages published for Fedora systems, achieving 25K+ downloads over the span of two years.
- Automated 100% of testing, package builds, and releases across multiple platforms, reducing release time by 87.5%.

Real-time Chat System using OTP (One Time Pads)

- Built a full-stack application using ASP.NET (MVC), PostgreSQL, with Python & JavaScript for client-side functionalities.
- Engineered REST API for file transfers with hash-based verification and authentication across multiple servers and clients.
- Optimized client performance to handle up to 1K+ messages per second with minimal latency; improved interaction responsiveness by 43% using Lit and custom event dispatching over shadow DOM.

PapersWithCode RSS (pwcode)

- Distributed updates on latest papers from PapersWithCode over RSS/Atom feed to 5K+ users with less downtime between upstream changes.
- Reduced pull request merge times by 25% by implementing pre-commit hooks during Git operations.

Conversation Flow Analyzer

- Built a web app to analyze various conversation data and extracted key terms from 200K+ messages.
- Reduced extraneous terms by 73% using a multi-language keyword filtering algorithm; achieved 86% accuracy in sentiment analysis.

AWARDS & RECOGNITION

MLTussle – 1st Place (Team Lead)   **April 2023**

- 1st Place in an inter-college machine learning competition by improving data efficiency of power grid systems.

SKILLS & INTERESTS

- **Technologies:**
  - **Languages/Databases:** Python; C#; Typescript; PostgreSQL
  - **Frameworks/Libraries:** Pytorch; JAX; LangChain; LangGraph; Vue.js; Nuxt.js; Tailwind CSS; Flask; FastAPI; ASP.NET (MVC);
  - **Web/Cloud:** AWS (Transcribe, ECS, Fargate), Microsoft Azure, REST APIs, Websockets, HTML, CSS
  - **Tools/Practices:** Git, Docker; Docker Compose; Podman; Agile, Linux; UI/UX Design
  - **AI:** Neural Networks, Machine Learning, Transformers; Computer Vision, Data Analysis and Visualization (Numpy, Pandas, Scikit-learn, Matplotlib, D3.js);

- **Skills:** Optimization Mindset; Adaptability; Project Management; Collaboration; Technical Communication;
- **Interests:** Camping; Photography; Traveling; Cycling;