Spoorthi Subramanya Bhat

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Skills

Programming Languages : Kotlin, Java, Python, JavaScript, SQL **Mobile Development :** Kotlin, Jetpack Compose, MVVM, Hilt, WorkManager, Jetpack Navigation, Room Database, Retrofit, Firebase Realtime Database, Firebase Auth, Compose Multiplatform, React Native, Flutter

Backend & Full Stack : FastAPI, Ktor, Spring Boot, REST APIs, SQLite, MySQL, MongoDB, SQL

Machine Learning & NLP : Python, PyTorch, TensorFlow, Scikit-learn, Pandas, NumPy, GPT-4, BERT, NLTK, SpaCy, LangChain, LlamaIndex, LoRA, HuggingFace Transformers, BLIP, LLaVA-Med, VQA-RAD, Gradio

Tools & Frameworks : Android Studio, Firebase Suite, Git, Postman, Gradle, Vector DBs

Education

University of Massachusetts, Dartmouth, MA Sept 2023 – Present
Master's in Computer and Information Science | GPA: 4.0/4.0

Experience

Graduate Student Assistant, University of Massachusetts – Dartmouth, MA January 2024 – Present

- Designed and developed a mobile application for a university-led substance use recovery program, enhancing usability, streamlining navigation, and boosting user engagement by 80% across 150+ active users using Jetpack Compose.
- Improved CWE classification accuracy by 22% on 12k+ NVD records using BERT and custom NLP preprocessing; also developed a sonar signal classifier with FFT and ML models, achieving 87% accuracy.
- Served as a Teaching Assistant for Object-Oriented Programming (Java) and Theoretical Computer Science, mentoring students.

Software Engineer, In Time Tec – Bangalore, India March 2022 – August 2023

- Developed a secure Android SDK for Equifax Inc. to capture device and behavioural data (sensor activity, location data) for fraud analytics, deployed in 100K+ production devices with support for Kotlin, Java, and cross-platform frameworks.
- Boosted bot detection accuracy by 25% by enabling real-time data flow for AI/ML-based fraud detection models, while reducing integration issues by 40% through modular SDK architecture and comprehensive client-facing documentation.
- Built scalable backend features for an e-commerce mobile app, reducing API call redundancy by 30% via smart caching and enhancing session security through encrypted local storage and secure token handling.
- Automated backend workflows using SQL triggers and stored procedures. Improved query performance by 20% and significantly reduced manual interventions in routine data operations.

Projects

Automated Medical Coding Using Hybrid Decision Trees - Master's Thesis | *Python, Scikit-learn, LSTM, GPT-4, MIMIC-IV*

- Designed and implemented a hybrid decision tree classification pipeline combining rule-based decision trees and LSTM models to automate ICD code prediction, reducing inference time by 38% on clinical discharge summaries.
- Achieved a 17% improvement in multi-label classification accuracy over deep learning-only and full rule-based baselines by applying hierarchical modeling and leveraging GPT-4 for semantic sentence extraction.

ReLeaf – Android Application for Substance Use Disorder | *Kotlin, Jetpack Compose, Firebase, Room Database*

- Built an end-to-end Android app using Jetpack Compose, Room, and MVVM architecture to support goal tracking, daily check-ins, and journaling for SUD patients, with offline functionality and real-time sync via Firebase.
- Implemented push notifications, encrypted local storage, and secure authentication flows to improve user retention, ensure data privacy, and comply with healthcare security requirements.

Weather Forecast – Modern Android App | *Kotlin, Jetpack Compose, Dagger-Hilt, MVVM, Weather API*

- Designed and developed a robust weather forecasting Android application using MVVM architecture, Repository pattern, and Dagger-Hilt to ensure modular, testable, and scalable code across feature layers.
- Integrated real-time weather APIs with location services, rate limiting, and fallback mechanisms, enabling seamless data access and app stability even under limited connectivity or API usage constraints.
- Improved overall UI responsiveness by 35% by optimizing Jetpack Compose rendering paths, implementing lifecycle-aware coroutine flows, and reducing cold-start latency through asynchronous state management.

Personal Expense Manager – Full Stack Web Application | *Spring Boot, JavaScript, MongoDB, REST APIs, HTML/CSS*

- Designed and developed a full-stack expense manager with Spring Boot (REST APIs), JavaScript frontend, and MongoDB backend, supporting multi-account tracking and CRUD operations.
- Applied NoSQL schema design in MongoDB to manage user-account-expense relationships efficiently.
- Implemented secure session-based authentication, modular dashboard components, and client-side search/filtering to enhance usability and system scalability.

DocuAssist AI – Intelligent Document Chatbot Using RAG Architecture | *Python, LangChain, LlamaIndex, FastAPI, Jetpack Compose, Kotlin, Retrofit, Gradio, Vector DB*

- Designed and implemented an AI-powered assistant that allows users to upload documents (PDFs) and ask natural language questions, solving the need for efficient document comprehension and navigation.
- Engineered a retrieval-augmented generation (RAG) pipeline using LangChain, LlamaIndex, and a vector database to ground GPT-based responses in source documents for accurate, real-time answers
- Developed the mobile interface using Jetpack Compose and integrated it with a FastAPI backend via Retrofit, delivering a full-stack solution that combines mobile UI, vector search, and AI reasoning.

VQA for Radiology – Medical QA System Using Vision-Language Models | *LLaVA-Med, VQA-RAD, HuggingFace, LoRA*

- Developed a radiology-focused visual question-answering (VQA) system by fine-tuning LLaVA-Med on the VQA-RAD dataset using LoRA. Combined computer vision and NLP to assist radiologists with scan interpretation, improving diagnostic support and reducing time-to-decision.

Image Captioning Android App Using Fine-Tuned BLIP | *Kotlin, Jetpack Compose, FastAPI, Gradio, PyTorch*

- Fine-tuned the BLIP vision-language model on a custom dataset to generate contextual image captions and deployed it using Gradio wrapped in a FastAPI service for efficient inference.
- Designed and developed an Android application using Jetpack Compose with MVVM architecture, enabling users to capture or upload images and interact with the backend via Retrofit for real-time captioning.
- Seamlessly integrated mobile UI with RESTful API communication and vision-language modeling to deliver an engaging, end-to-end AI-powered captioning experience on Android.

Sports Management Client-Server Application | *Java, Socket Programming, Multi-threading, JSON, MySQL*

- Built a Java-based client-server system using socket programming for real-time sports team and game management.
- Developed a multi-threaded server with JSON-based communication and MySQL integration for persistent data handling.

Publications

Spoorthi Bhat, Haiping Xu, Joshua Carberry. *Automated Medical Coding Using a Hybrid Decision Tree with Deep Learning Nodes*, submitted to **IEEE CISOSE 2025**. *(Status: Accepted for publication)*.

H.A. Chaya Kumari, **Spoorthi S. Bhat**, M. Sucharith, T.S. Pooja, B.C. Thanmayi. *Indoor Navigation Using BLE Beacons*, in *Recent Trends in Computational Sciences*, 1st Edition, CRC Press, 2023. ISBN: 9781003363781. [Link]

Awards: FUCHS Intelligent Data Discovery Hackathon 2024 - Won the 'Most Impactful Solution' and 'Best Machine Learning Technique' awards ($500 total)