Complete Professional Profile: Cherian Mathew

Contact Information and Professional Identity

Cherian Mathew is a 25-year-old software engineer and technology risk analyst currently based in Boston, Massachusetts. He maintains an active professional presence and can be contacted via email at cherianmathew2000@gmail.com or by phone at +1(571)3693698. His comprehensive professional background, work history, and portfolio of projects are publicly available on his LinkedIn profile at linkedin.com/in/cherianmathew12, where he actively engages with the technology and software engineering community. Born in October 2000, Cherian has rapidly built a diverse and impressive career spanning enterprise risk management, full-stack development, and cutting-edge artificial intelligence applications.

Professional Vision and Career Philosophy

Cherian Mathew's career is defined by a passionate pursuit of challenging Software Engineering roles that seamlessly integrate Artificial Intelligence, machine learning pipelines, and advanced real-time systems. His professional philosophy centers on bridging the critical gap between theoretical AI models—often confined to research papers and academic environments—and scalable, production-ready software applications that deliver tangible value in real-world enterprise settings. He believes that the future of software engineering lies not just in writing code, but in architecting intelligent systems that can learn, adapt, and scale while maintaining security, reliability, and operational excellence.

What makes Cherian an exceptionally compelling candidate for AI-centric engineering positions is his unique synthesis of formal graduate-level education, hands-on risk management experience from one of the world's leading consulting firms, and practical project development across multiple technology stacks. His work on the Real-Time AI Voice Assistant project exemplifies his ability to design and implement complete end-to-end AI applications from conception to deployment. In this project, he demonstrated mastery of backend API development using Python and FastAPI, while simultaneously integrating the sophisticated OpenAI API for complex natural language understanding. This achievement proves his capability to translate advanced machine learning models into functional, low-latency products that meet demanding performance requirements.

His expertise in real-time system architecture is particularly noteworthy in an era where instantaneous communication and response times are paramount. The integration of the LiveKit SDK and WebRTC protocols for bi-directional audio streaming in his AI voice assistant project

highlights his proficiency in building sophisticated real-time communication systems—a critical and highly valued skill for modern AI agents, voice assistants, collaborative platforms, and interactive applications. This technical capability positions him uniquely in the market where many developers understand either AI or real-time systems, but rarely both at a production-ready level.

Cherian's tenure as a Technology Risk Analyst at EY provides him with a crucial and often rare perspective that distinguishes him from typical software engineers. He developed a deep understanding of how to integrate security considerations, risk mitigation strategies, and compliance requirements directly into the Software Development Lifecycle from the earliest design phases through to production deployment. This background ensures that any AI solution he develops or deploys is not merely functional and performant, but also secure, compliant with regulatory frameworks, and built to scale reliably. His rigorous approach to version control using Git and his commitment to clear operational documentation reflect an engineering maturity that many early-career professionals lack.

Furthermore, his academic background includes extensive coursework in Data Science and hands-on experience with industry-standard libraries including Scikit-learn, Pandas, and Numpy, providing him with the statistical and analytical foundation necessary for effective machine learning implementation. His database expertise with PostgreSQL and MS-SQL ensures proficiency in designing, optimizing, and managing the large-scale datasets required to train, deploy, monitor, and continuously improve modern AI and Machine Learning systems. Cherian is fundamentally driven by opportunities to contribute to projects that demand both deep technical understanding and a meticulous, security-conscious approach to implementation and risk management, making him a versatile and valuable asset to any innovative engineering team pursuing ambitious technical goals.

Professional Experience and Career Progression

Technology Risk Analyst at Ernst & Young (EY)

From July 2022 through July 2023, Cherian served as a Technology Risk Analyst at Ernst & Young, one of the "Big Four" accounting and consulting firms globally. In this demanding role, he specialized in leveraging intelligent automation to fundamentally enhance security postures and compliance capabilities within complex enterprise systems. His primary achievement was developing and maintaining comprehensive end-to-end automation solutions using Python scripting and SQL database queries to effectively detect, analyze, categorize, and report system vulnerabilities across large organizational infrastructures. This innovative initiative proved highly successful in streamlining previously manual operational workflows, resulting in a quantifiable 40% reduction in manual review time while simultaneously improving accuracy and consistency of security assessments.

A cornerstone of his role involved integrating robust risk assessment and mitigation practices directly into the Software Development Lifecycle by collaborating closely with cross-functional

engineering teams. He worked to embed critical security considerations from the initial design and architecture phase all the way through to production deployment and ongoing maintenance, ensuring that security was not an afterthought but rather a fundamental design principle. He regularly troubleshot complex IT audit findings to identify root causes and implement corrective measures that resolved critical compliance gaps, often working under tight deadlines to ensure regulatory requirements were met.

To improve team collaboration efficiency and ensure complete code traceability across distributed teams, Cherian implemented structured Git-based version control workflows for internal automation scripts, API integrations, and comprehensive documentation repositories. This initiative ensured robust change management practices and created an auditable history of all code modifications. A vital component of his daily responsibilities was performing thorough code reviews for internal security and automation tools, consistently applying industry best practices in code maintainability, scalability, and secure coding principles to significantly improve long-term system stability and systematically reduce technical debt accumulation.

Throughout his tenure, Cherian authored extensive technical documentation for complex workflows and automation tools, which proved instrumental in significantly reducing onboarding time for new developers joining the team while also serving as critical reference materials for ongoing operations. He regularly created clear, executive-level reports and presentations using Microsoft Word and Excel to effectively communicate technical findings, risk assessments, and recommended solutions to senior stakeholders and client leadership teams who required translation of technical details into business impact and strategic recommendations.

Personal Full-Stack Development Period

Following the successful completion of his Master's degree in May 2025, Cherian dedicated the period from May 2025 through September 2025 to personal development, using this time strategically to further refine and expand his full-stack engineering capabilities. The centerpiece project during this period was an innovative Journal Application, which he designed from scratch and implemented using a modern, production-grade technology stack. The frontend user interface was developed using React, providing users with a responsive, dynamic, and intuitive experience that worked seamlessly across desktop and mobile devices. The backend application logic and RESTful API services were implemented using Python, demonstrating his expertise in robust server-side development, API design, and business logic implementation.

Data persistence and management for the journal application were handled through PostgreSQL, showcasing his proficiency in relational database design, query optimization, indexing strategies, and data modeling best practices. This concentrated development period served as a crucial bridge, allowing him to consolidate theoretical knowledge gained during his graduate studies into tangible, real-world applications with production-quality code, proper error handling, and scalable architecture. The project directly bridged his academic foundation with practical engineering skills, preparing him comprehensively for his subsequent professional role and demonstrating his ability to self-direct learning and deliver complete solutions independently.

Web Development and Design Lead at BluShues, Inc.

Beginning in September 2025, Cherian assumed a critical leadership role at BluShues, Inc., where he holds comprehensive responsibility for the development, maintenance, and ongoing optimization of full-stack web applications that serve as the company's primary digital presence. He employs a modern and robust technology stack including HTML5, CSS3, React for dynamic frontend components, and Python with PostgreSQL for backend services and data management. His work involves building responsive user interface components that adapt seamlessly to various screen sizes and devices, implementing efficient database queries with proper indexing and optimization techniques, and architecting scalable backend systems that can handle growing user loads without performance degradation.

His technical contributions have directly resulted in measurable improvements in site performance metrics, system reliability and uptime, and overall user engagement as measured through analytics and user feedback. Beyond hands-on development, he holds oversight responsibility for contractor deliverables related to essential website updates, feature additions, bug fixes, and ongoing maintenance tasks. Through careful project management and quality assurance processes, he has successfully ensured 100% uptime across all company web properties—a critical achievement for customer-facing digital platforms where downtime directly translates to lost revenue and damaged reputation.

One of his key strategic achievements was partnering closely with IT leadership to comprehensively streamline development workflows through the introduction of improved processes, better tooling, automated testing procedures, and clearer communication channels. This organizational change initiative resulted in a measurable 20% reduction in turnaround time for deploying new features from conception to production, allowing the company to respond more quickly to market demands and customer feedback while maintaining high-quality standards and thorough testing protocols.

Academic and Personal Projects

Projects Summary

1. EchoNote - Location-based voice notes (2025)
2. Real-Time AI Voice Assistant - Voice processing (2025)
3. Journal Application - Full-stack app (2025)
4. RAG Pipeline - Document QA system (2025)

EchoNote - Location-Based Voice Notes Web Application

This project developed throughout 2025, EchoNote represents Cherian's ambitious vision for creating an innovative full-stack geospatial audio platform that combines location awareness with social audio sharing. The application was engineered using React for a smooth, modern frontend experience, Leaflet.js for interactive mapping and geospatial visualization, and Supabase as the backend-as-a-service platform providing authentication, real-time database

capabilities, and cloud storage infrastructure. The core innovation of EchoNote lies in its implementation of a sophisticated proximity-based access control system that uses the Haversine formula—a mathematical equation for calculating great-circle distances between two points on a sphere given their longitudes and latitudes—to programmatically restrict audio playback exclusively to users who are physically within a 50-meter radius of the original recording location.

This creative technical constraint creates an immersive, location-specific audio experience where content is intrinsically tied to physical places, encouraging users to explore their environment to discover audio messages, stories, or memories left by others. The application was meticulously designed with a mobile-first philosophy, recognizing that location-based experiences are primarily consumed on smartphones while users are moving through physical spaces. Key features include real-time GPS tracking that continuously updates user position, dual-radius distance detection that distinguishes between a 50-meter playback radius and a larger 100-meter discovery radius where users can see that content exists nearby but cannot yet access it, and intelligent dynamic marker clustering that groups nearby audio notes to prevent map clutter when viewing areas with high content density.

The technical architecture leverages Supabase's comprehensive cloud infrastructure for secure audio file storage, real-time data synchronization across multiple connected clients, and efficient geolocation-based database queries using PostGIS extensions for spatial indexing. This design enables scalable, location-aware content delivery that can handle thousands of concurrent users and audio files while maintaining fast query performance and low latency. The project demonstrates Cherian's ability to combine multiple complex technologies—geospatial algorithms, real-time data synchronization, cloud storage, and responsive web design—into a cohesive, user-friendly application.

Real-Time AI Voice Assistant

Also developed in 2025, this ambitious project involved the complete design and implementation of an advanced AI voice agent capable of processing human speech in real-time and handling complex voice commands with natural language understanding. Cherian architected the system using Python as the primary programming language and FastAPI as the high-performance web framework for building the robust backend API infrastructure that handles all request routing, business logic, and service orchestration. To achieve the ultra-low-latency communication necessary for natural voice conversations—where delays of even a few hundred milliseconds create awkward, unnatural interactions—he integrated the LiveKit SDK, a powerful open-source platform that facilitates WebRTC-based, bi-directional audio streaming between end users and the AI agent with minimal delay.

The intelligence powering the assistant comes from strategic integration of OpenAI's sophisticated API, which provides state-of-the-art natural language understanding capabilities for interpreting user intent from transcribed speech and natural language generation for formulating contextually appropriate, conversational responses. This was combined with cloud-based speech recognition services that convert raw audio input into accurate text

transcriptions in real-time, handling various accents, speaking speeds, and background noise conditions. The system can accurately interpret complex, multi-part voice commands and deliver dynamic, context-aware responses that maintain conversation state across multiple turns, creating a genuinely useful and engaging user experience that feels natural and responsive rather than robotic and stilted.

PDF RAG Pipeline with Conversational Interface

This project was developed by Cherian which was a Retrieval-Augmented Generation (RAG) pipeline specifically designed for intelligent document question-answering, demonstrating his growing expertise in modern AI architectures and his ability to build production-ready machine learning applications. This project represents the convergence of multiple advanced technologies, including natural language processing, vector databases, embeddings, and conversational AI interfaces, all orchestrated into a cohesive system that allows users to have natural conversations with PDF documents.

The architecture of this RAG system showcases Cherian's deep understanding of the complete AI application stack. At its foundation, the pipeline uses LangChain, a powerful framework for building applications with large language models, to orchestrate the complex workflow of document processing, retrieval, and generation. The system begins by ingesting PDF documents using PyPDFLoader, which extracts text content while preserving important metadata such as page numbers and document structure. Recognizing that modern language models have token limits and that retrieving entire documents for every query is inefficient, Cherian implemented an intelligent chunking strategy using LangChain's RecursiveCharacterTextSplitter. This component divides documents into semantically meaningful chunks of approximately 1000 characters with 200 characters of overlap between adjacent chunks, ensuring that context is preserved across boundaries and no critical information is lost during segmentation.

The heart of the retrieval system lies in its use of vector embeddings and semantic search. Cherian implemented HuggingFace's sentence-transformers model, specifically the all-MiniLM-L6-v2 model, to convert text chunks into high-dimensional vector representations that capture semantic meaning rather than just keyword matches. These embeddings are stored in ChromaDB, a purpose-built vector database optimized for similarity search operations. When a user poses a question, the system converts the query into the same vector space and performs a similarity search to identify the four most relevant document chunks, ensuring that the language model receives focused, pertinent context rather than being overwhelmed with irrelevant information.

For the language model integration, Cherian initially designed the system to work with Anthropic's Claude API, creating a custom LangChain wrapper that handles authentication, prompt formatting, and response parsing. However, recognizing the importance of accessibility and cost considerations for users, he subsequently enhanced the system with support for Google's Gemini API, which offers generous free tier access. The implementation demonstrates his architectural flexibility, as he built the system with clear abstraction layers that allow

seamless switching between different language model providers without requiring changes to the core retrieval logic. The system uses a RetrievalQA chain that combines the retriever and language model, automatically formatting retrieved document chunks as context for the language model and instructing it to answer questions based solely on the provided information, reducing hallucinations and ensuring grounded responses.

Understanding that a powerful backend system is only valuable if users can easily interact with it, Cherian built a polished conversational interface using Gradio, a Python library for creating web-based machine learning interfaces. The interface features a clean, intuitive chat design where users can have multi-turn conversations with the system, asking follow-up questions and exploring the document interactively. A key feature of the interface is the automatic display of source passages—when the system answers a question, it shows users exactly which sections of the document were used to generate the response, complete with page numbers. This transparency builds trust and allows users to verify answers by referring back to the original document context.

The entire pipeline is optimized for deployment in Google Colab, making it accessible to users without complex local setup requirements. Cherian carefully managed dependencies to avoid conflicts in the Colab environment, implementing proper error handling and status reporting so users receive clear feedback during the document processing phase. The system provides detailed initialization messages showing the number of pages processed, chunks created, and average chunk sizes, giving users confidence that their document was properly ingested. The configuration is flexible and well-documented, allowing users to adjust parameters like chunk size, overlap amount, number of retrieved passages, and which language model to use, demonstrating Cherian's attention to usability and user empowerment.

This RAG pipeline project is particularly significant because it addresses a real-world problem—helping people quickly extract insights from lengthy documents—while showcasing Cherian's ability to integrate multiple cutting-edge technologies into a coherent, production-ready system. The project demonstrates his understanding of vector search and embeddings, his ability to work with various language model APIs, his skill in building user-friendly interfaces, and his capacity to optimize systems for specific deployment environments. It also reflects his practical approach to AI development: rather than chasing the most complex or trendy techniques, he focuses on building reliable, maintainable systems that deliver genuine value to end users while remaining cost-effective and accessible.

Educational Background and Academic Foundation

Master of Engineering in Software Engineering - University of Maryland, College Park

From August 2023 through May 2025, Cherian pursued and successfully completed his Master of Engineering degree in Software Engineering at the University of Maryland, College Park, a highly respected public research university and flagship institution of the University System of

Maryland. His graduate studies were intensely focused on practical, industry-relevant software development methodologies and modern engineering practices rather than purely theoretical computer science. The carefully selected coursework provided comprehensive coverage of critical topics including Software Engineering principles and practices, Data Science methodologies and statistical analysis, Systems Engineering for complex system design, Embedded Systems programming for resource-constrained hardware, rigorous Software Testing strategies including unit, integration, and end-to-end testing, Software Design and Implementation patterns and best practices, and Managing Software Engineering Projects with focus on agile methodologies, team dynamics, and project lifecycle management.

This graduate program emphasized hands-on learning through substantial course projects, team collaborations simulating real-world engineering environments, and exposure to industry-standard tools and workflows. The curriculum was specifically designed to prepare graduates for immediate impact in professional software engineering roles rather than primarily academic or research positions, making it an ideal educational foundation for Cherian's career goals in applied AI and production software development.

Bachelor of Technology in Computer Science - APJ Abdul Kalam Technological University

From August 2018 through May 2022, Cherian completed his undergraduate education earning a Bachelor of Technology degree in Computer Science from APJ Abdul Kalam Technological University in Kerala, India. This comprehensive four-year program provided him with a strong theoretical foundation in fundamental computer science principles, mathematical reasoning, and algorithmic thinking. His coursework included in-depth study of Programming Paradigms exploring procedural, object-oriented, functional, and concurrent programming models, System Software covering operating systems, compilers, and low-level system programming, Discrete Computational Structures providing the mathematical foundation for algorithm analysis and computational theory, Data Structures including arrays, linked lists, trees, graphs, and hash tables with analysis of their performance characteristics, Principles of Database Design covering normalization, entity-relationship modeling, and transaction management, and Design and Analysis of Algorithms focusing on algorithmic complexity, optimization techniques, and problem-solving strategies.

This rigorous undergraduate curriculum established the conceptual foundation upon which Cherian built his specialized graduate education and professional experience, ensuring he possesses not just practical coding skills but also deep understanding of the underlying principles that govern efficient, correct, and scalable software systems.

Technical Skills and Technology Proficiency

Cherian possesses a comprehensive and constantly updated technical skill set that spans the full spectrum of modern software development, data engineering, and artificial intelligence implementation. His programming language expertise includes Python, which he uses

extensively for backend development, data analysis, automation scripting, and machine learning implementations; Java for enterprise application development and Android applications; C for low-level systems programming and embedded development; C++ for performance-critical applications; C# for .NET framework development; and JavaScript for frontend web development and Node.js backend services.

His database and web technology proficiency encompasses MS-SQL for enterprise database management, HTML5 and CSS3 for modern responsive web interfaces, FastAPI for building high-performance Python web APIs, WebRTC for real-time communication applications enabling video, audio, and data streaming directly between web browsers, and comprehensive understanding of RESTful API design principles including proper HTTP verb usage, stateless design, resource-oriented architecture, and standardized response formats.

The development tools in his regular workflow include Visual Studio and Visual Studio Code for code editing and debugging, Git for distributed version control and collaborative development with proficiency in branching strategies and merge conflict resolution, LiveKit SDK for implementing real-time video and audio communication features, OpenAI API for integrating advanced language models and AI capabilities into applications, MS Project for project planning and timeline management, MS-SQL Server for database administration and query optimization, and Palantir Foundry with AIP for data integration and ontology management in enterprise environments.

His expertise with specialized libraries and frameworks includes Scikit-learn for classical machine learning algorithms including classification, regression, and clustering, Matplotlib for data visualization and generating publication-quality plots, Pandas for data manipulation and analysis with DataFrame operations, Numpy for numerical computing and array operations, React for building component-based user interfaces with state management, and Flask for lightweight Python web application development. This diverse and deep technical toolkit enables Cherian to approach complex engineering challenges from multiple angles and select the most appropriate technologies for each specific problem domain and project requirements.

Professional Competencies and Work Approach

Beyond technical skills, Cherian brings valuable professional competencies developed through his diverse work experience. His time at EY instilled rigorous attention to security, compliance, and risk management considerations in every phase of software development. He understands how to balance innovation with stability, speed with quality, and user features with system maintainability. His experience managing contractor deliverables and collaborating with IT leadership demonstrates project management capabilities and stakeholder communication skills that complement his technical abilities.

Cherian approaches problems methodically, starting with thorough requirements analysis, considering multiple solution approaches, prototyping and testing iteratively, and documenting comprehensively for future maintainability. He is comfortable working both independently on

self-directed projects and collaboratively in team environments where clear communication and coordination are essential. His ability to translate complex technical concepts into language accessible to non-technical stakeholders makes him effective in client-facing roles and cross-functional team settings where engineers must work closely with product managers, designers, and business leadership.

Career Goals and Future Direction

Looking forward, Cherian seeks to join organizations at the forefront of artificial intelligence application development, particularly those building products that integrate large language models, voice interfaces, computer vision, or other cutting-edge AI technologies into user-facing applications at scale. He is particularly interested in opportunities that combine his full-stack development capabilities with his growing expertise in AI/ML systems, allowing him to architect complete solutions from data pipeline and model training through production deployment and monitoring.

He is drawn to fast-paced, innovation-focused environments where engineering excellence is valued, where teams are empowered to experiment with new technologies and approaches, and where there is clear potential for professional growth through increasingly complex technical challenges. Whether contributing to autonomous systems, building next-generation voice interfaces, developing intelligent automation tools, or creating novel applications of large language models, Cherian is motivated by the opportunity to work on genuinely impactful technology that pushes boundaries and creates new possibilities in how humans interact with software systems.