VAIDYANATHAN P K

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WORK EXPERIENCE

Software Engineer, AI Foundations
Meta Reality Labs, Developer & Pro Platforms Group

📅 March 2024-Present 📍 Bellevue, United States

- Leading AI Foundations Team of 6 engineers building AI-driven developer platforms for Horizon ecosystem (VR/MR, mobile, web, desktop), impacting 20k+ developers building for the Metaverse.
- Built foundational infrastructure powering agentic coding assistants, focusing on safe and reliable AI assistance through rigorous evaluation frameworks. Improved code generation accuracy to 85%+ and reduced onboarding time by 60%.
- Designed novel Knowledge Graph System with 500K+ nodes powering Meta Horizon Worlds Gen AI Assistant. Established comprehensive evaluation methodology achieving 78% precision and 88% recall through golden-set benchmarks. Filed patent with USPTO.
- Architected AI-ready documentation pipelines processing 10K+ API endpoints with vector indexes. Achieved <200ms latency and 40% token cost reduction through intelligent chunking and context-aware retrieval.
- Speaker at Meta Connect 2025: Presented on responsible development of agentic AI systems to 5,000+ developers. Featured in Connect Developer Keynote (100K+ viewers).

`Agentic AI` `Knowledge Graphs` `Retrieval Frameworks` `Evaluation & Safety`
`Vector DBs` `RAG` `AST` `Developer Experience`

Senior Software Development Engineer
Amazon, Teams: Intelligent Shopping Assistant, ShopFlow

📅 September 2022-March 2024 📍 Seattle, United States

- Led team of 10 engineers/data scientists to build Rufus, Amazon's generative AI shopping assistant using LLMs. Tackled challenges in prompt engineering, context management, hallucination mitigation, and grounding responses in factual product data. Proposed during hackathon, acknowledged by CEO and S-Team.
- Led team of 8 engineers to build scalable ML orchestration platform using MetaFlow for model training and inference pipelines, improving infrastructure efficiency and boosting productivity of 20 teams through standardized ML workflows.

`LLMs` `Prompt Engineering` `Hallucination Mitigation` `Context Management`
`RAG` `LangChain` `Vector DBs` `Python` `MetaFlow`

Software Development Engineer II
Amazon, Teams: Alexa Communications, Alexa Shopping ASR

📅 September 2017 – August 2022 📍 Seattle, United States

- Led cross-org team of 8 engineers to build ML-powered voice shopping platform for Alexa, tackling challenges in spoken language understanding, intent classification, and entity resolution. Onboarded 25 clients in 6 months with robust NLP pipelines.
- Led team of 6 engineers to build Alexa-Alexa calling experiences across 100s of 1P & 3P devices internationally. Invented novel drop-in experience used during COVID-19 for patient-doctor communication in US hospitals, prioritizing reliability and user safety.
- Led team of 4 engineers to build automated speech recognition system using Open Source ASR Engines, focusing on long tail item recognition through acoustic modeling and language model optimization. Improved accuracy significantly for rare product names.

`NLP` `Spoken Language Understanding` `ASR` `Intent Classification`
`Entity Resolution` `Acoustic Modeling` `OpenAI-Whisper` `Python` `Java`

Software Development Engineer I
Amazon, Teams: Retail Selection & Price Monitoring

📅 June 2015 – August 2017 📍 Chennai, India

- Built scalable batch processing system using Apache SPARK to process PBs of Amazon Catalog data daily, implementing predictive models for demand forecasting and competitive analysis.
- Built multi-tenant distributed crawling framework to monitor & update live prices, tackling challenges in data extraction, deduplication, and real-time synchronization at scale.

`Apache SPARK` `AWS Services` `Java` `Python` `Big Data`

EDUCATION

Bachelor of Engineering, Computer Science
Anna University, First class with Distinction

📅 2011 – 2015 📍 Chennai, India

Higher Secondary Education
All Angels Matriculation, 98% Aggregate, District Topper

📅 2010 – 2011 📍 Chennai, India

PATENTS/PUBLICATIONS

- **AI-Driven Developer Experience (Meta):** Patent filed for novel Knowledge Graph System enabling context-aware code assistance through structured knowledge representation and semantic retrieval (USPTO, 2024-2025).
- **Voice Communication Systems (Alexa):** Novel communication methodology for hands-free calling with privacy and consent management. US Patent Issued.
- **Speech Recognition Optimization (Alexa):** Novel approach to improve ASR accuracy for long tail and rare entity names through adaptive language modeling. US Patent Issued.
- **Voice Product Disambiguation (Alexa):** Novel method for disambiguating product catalog items in voice interfaces. US Patent Issued.
- **Speech Error Prediction (Alexa):** Predictive model for ASR error detection and correction. US Patent Pending.

ACHIEVEMENTS

- **Meta Connect 2025 Speaker:** Featured speaker presenting "Optimising Horizon Developer Experience for the Agentic AI Era" to global developer audience, focusing on responsible development of agentic AI systems. Team's work showcased in Connect Developer Keynote.
- **Meta Inventor Award:** Filed patent for novel AI-driven developer experience innovations including Knowledge Graph System architecture for safe and reliable agentic coding assistance.
- **Amazon Inventor Award:** Awarded 4 inventor awards for technical innovations in Alexa Spoken Language Understanding, Neural LLMs, and speech recognition systems.
- **Amazon DCCP Star Award:** Recognized as best performer in organization for outstanding technical contributions and engineering excellence (2017).
- **ACM ICPC Regional Finalist:** Top 10 at Kharagpur 2014, Top 25 at Amritapuri 2015.
- **Codechef Certified DSA Expert:** Grade 100% in Proctored Exam.

LEADERSHIP

- **Amazon Leadership Team - Management Leadership For Tomorrow:** Represented Amazon to deliver tech talks for 1000 underrepresented students across the US.
- **Amazon SDE Bootcamp Instructor:** Instructor for Amazon SDE bootcamp to mentor new hire SDEs about Amazon culture and tech platforms.
- **Education & Volunteering:** Active coordinator for Amazon Future Engineer programs and served as senior volunteer for educational programs in TamilNadu, India, supporting underrepresented communities.