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Summary

- Versatile Engineer with expertise spanning application development, encompassing front-end, back-end, software engineering, machine learning, and database design.
- Seasoned Engineering Manager with 15-year experience in the design, development, and maintenance of software applications.
- Proficient in full-stack development, committed to delivering superior code quality and scalable solutions.

Skills

- Programming Languages: Java, JavaScript, Python, C++
- Machine Learning: Data Curation, Fine tuning LLMs, RAG, Evaluations.
- Prompt Engineering. Designing DSLs, Building Parsers.
- Compiler Tools: ANTLR3, ANTLR4.
- Databases: Data Modelling, MySQL, PostgreSQL
- Web Development: HTML, CSS, Node.js.
- Version Control: Git, Mercurial
- Software Tools: IntelliJ IDEA, Visual Studio Code, PyCharm
- Problem Solving: Algorithm design, debugging
- Team Collaboration: Strong communication and teamwork skills

WORK EXPERIENCE

Head of Engineering(Applied AI) | Zoho Creator | Feb 2023 - Present

AI Assistant to Ease App and Form Creation

- Leveraged the power of AI to streamline application and form creation with intuitive, language-based instructions.
- Skills Used:
 - Prompt Engineering
 - Designing a efficient Domain Specific Language(DSL) that reduces cost, time and efficient than JSON
 - Built a Parser(Forgiving parser) to parse the DSL
 - Built Evaluations and Test Cases
- Work reference:
 - <https://www.youtube.com/watch?v=TOsRhrSXohY>
 - <https://www.zoho.com/creator/product-roadmap.html> (Titled - Zia assistant powered by OpenAI in the year 2023)

Natural language instructions to Deluge Code using AI (<https://www.zoho.com/deluge/>):

- User types his requirement into the Deluge editor and the corresponding code to achieve it will instantly appear, with the AI assisting the user in crafting the code.
- Retrieval Augmented Generation(RAG)
- Deployment of RAG service. Worked with efficient Text Embeddings and Distance Functions.
- Fine Tuning LLMs (Large Language Models)
 - Open AI - GPT 3.5
 - CodeLLAMA - 34B
 - Mixtral 8x7B
 - Mistral 7B.
- Performed hyper parameter tuning of LLMs.
- Provided insights on how the product could leverage AI and ML capabilities for increased efficiency.
 - Semantic Search.
 - Vector search over database.
- Work Reference:
 - AI assistance in Deluge in the roadmap. (<https://www.zoho.com/creator/product-roadmap.html>)
- Skills Used:
 - Prompt Engineering.
 - Instruction Fine-Tuning.
 - Python.
 - Automated Evaluations.

Technical Architect

Jul 2022 - Feb 2023

Zoho Creator

Ported an important part of Deluge / DRE code from ANTLR3 to ANTLR4.

- As End of Life(EOL) date is announced for ANTLR3, I helped the team move Deluge Expression parser and CRUD operations part of the code to ANTLR4.
- Able to Learn Quickly and Adapt to writing a lexer and parser.
- Presented the team on the importance of Automated tests (System testing).
- Initiated and explained the power of automated testing to the team.

Write once and Run everywhere: Cross Platform Deluge syntax error checker

- Previously, Syntax error highlighter works via sending the code to our server.
- where we parse syntax-related issues and send the error list back to the web client.with this work in C++, the code is compiled to Web Assembly(WASM) and the syntax error checker can be deployed in the client(edge) itself. which helps in instant error checking in the edge. This reduces server costs and Network Latency.
- This can also be deployed as a plugin to various code editors and IDEs.

Senior Back-End Developer

Sep 2020 - Jul 2022

Zoho Creator

- Developed a Feature to Create Indexes and Unique Key Constraints In Zoho Creator, which eases users achieve performance and removes various manual interventions by the user to de duplicate data.
- Developed and maintained backend services using Java,Redis,Mickey (Internal Hibernate Equivalent) and MySQL.
- Ideated and Built a SQL Query Visualization Tool(using javascript, D3.js and JSQLParser), which helps support teams resolve issues quickly. This helped bring down the support resolution time multi-fold.
- Ran database migrations from existing Index tables to newly designed data tables.
- Identified and fixed bugs in the production environment quickly.
- Wrote Automated System Tests to improve maintainability of the code.
- Provided technical guidance and mentorship to junior developers.
- Optimised existing SQL queries to improve application performance.
- Created a tool to Optimise Performance of SQL queries by indexing columns to improve application performance.
- Other Skills Used: Data modelling in Databases. SQL. MySql.

Lead Machine Learning Engineer

Apr 2016 - Aug 2020

Zoho Labs

Receipt Digitizer

- Project used by Zoho Expense Module.
- Receipt digitizer pipeline consists of (Image Orientation Detection, OCR and Information Retrieval)
- Lead a team of 4 and Built a receipt digitizing pipeline using python and opencv.
- Took care of server architecture, security of the product.
- Created a setup for annotators to annotate images using Local Mechanical Turk.
- Worked on Information Retrieval to retrieve important contents from Receipt Text to be shown to the Receipt evaluator for Validation.
- Reference: <https://www.zoho.com/in/expense/receipt-scanner-app/>
<https://dropbox.tech/machine-learning/creating-a-modern-ocr-pipeline-using-computer-vision-and-deep-learning>

iOS SDK for fast and accurate Document detection:

- Built the SDK using Hough transforms, Machine learning based Edge detection instead of widely used Canny edge detector.
- Orientation Correction.
- Shadow Removal.
- Written using Objective C and CPP using a bridge layer.
- Reference: <https://dropbox.tech/machine-learning/fast-and-accurate-document-detection-for-scanning>

Accurate optimal width detection of a column in Zoho Sheet, as the text width varies across different browsers and different operating systems with each using different rendering engines.

- Explored a Machine Learning based solution as a hobby project.
- Synthetic data of words(from project Gutenberg) with various word lengths generated using Cairo.
- Got the exact length of pixels using projects such as Puppeteer(Chrome), PhantomJS(Safari) and SlimerJS(Firefox).
- Trained a linear regression model. Did not work that well.
- Trained a Random Forest Regression Model which was good.
- Cons of this approach was the size of the Random Forest Regression model was large.

Data De Duplication at Table Level.

- Explored a De Duplication setup for a Lead Enrichment service built by Zoho.
- Built a Tool with exact match for de duplication in Database.
- Explored Clustering and other nearest Neighbour approaches.
- Explored Approximate Nearest neighbour approaches for this problem.

Team Lead (Front End and Full Stack) | Zoho Sheet | Jun 2012 - Apr 2016

- Lead a team of Eight front-end developers to design, develop and maintain web applications utilising HTML5, CSS3, JavaScript and AJAX technologies.
- Collaborated with the back-end development teams to ensure seamless integration between client side and server side code.
- Highlights:
- Mentored junior developers and Implemented Various features in Zoho sheet.
- Brought down the page loading time from 25 seconds down to 3 seconds, using various techniques.
- Patent was Applied with the Title "SYNCHRONISED VIEWS FOR CLOUD-BASED FILE COLLABORATION" for brainstorming this feature.
- Served as Security In Charge of the product.
- Built XSS identifier tools using Esprima javascript parser.
- Encouraged feature owners to develop software that are Secure by Design.
- Built the New Front end of Zoho Sheet that was compliant with Content Security Policy(1.0)

Member of Technical Staff | Zoho Sheet | Jul 2008 - May 2012

- Developed various features using Java, SQL Javascript, HTML, CSS.
- Developed Insert HTML feature.
- Buttons for Macro execution in Zoho Sheet.
- Front end framework for dragging, resizing and images, charts, buttons and other front end components were done.
- Developed Hide rows and Hide Columns.
- Developed Auto Filter Feature in Zoho Sheet.
- Raised Various Security bugs with in Zoho (XSS, CSRF, Click Jacking etc).

- Conducted knowledge sharing session across teams and demonstrated such vulnerabilities.
- Co-ordinated with the central security team and provided insights into developing various security tools.
- Conducted security Hackathons with in the team to promote security awareness.

Education

Bachelor of Engineering in Computer Science | PSNACET, Dindigul | 2004 - 2008