

# BHARATHI RAMANA JOSHI

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## EXPERIENCE

### Backend Engineering

*Product Engineer*

**Sprinklr, Inc.**

*July 2023 to present*

- Reduced average client bandwidth consumption from **750kbps** to **75kbps** for Sprinklr's case management module by improving Sprinklr's **MQTT** system design to eliminate unnecessary updates from servers.
- Implemented **OAuth 2.0** based integration for Gmail and Microsoft Exchange accounts; enabling corporations to securely manage emails across providers through Sprinklr in a unified manner.
- Implemented client-side rate-limiting utilizing Redis, ensuring no Sprinklr SLA breaches owing to rate-limit violations for Sprinklr's Outlook email account integration via **Microsoft Graph APIs**.
- Implemented a **no-code LLM pipeline builder** for Retrieval Augmented Generation (RAG), empowering companies with an AI-solution to incorporate their **knowledge base** into their case management.
- Debugged various production-scale issues such as **unexpected delays**, **race conditions**, **OOM errors**, **misconfigurations**, etc; utilizing logging and monitoring tools such as **Graylog**, **Kibana**, and **Prometheus**.

### Compiler Engineering

*Open Source Contributor*

**MLIR, LLVM**

*July 2023 to May 2024*

- Implemented loop dependence analysis using MLIR's presburger arithmetic library in **C++**.
- Resulted in code contributions, bug reports & fixes to upstream MLIR. [GitHub commits](#), [phabricator patches](#).

### Pure Logic Programming Research

*Student Researcher*

**Supervised by Dr. William Byrd**

*Dec 2020 to Dec 2023*

- Designed and implemented metaKanren, a relational interpreter for a [miniKanren](#) language that supports Constraint Logic Programming.
- Original research lead to multiple publications and talks.

### Google Summer of Code

*Student Contributor*

**Haiku**

*May 2019 to July 2019*

- Extended the **btrfs** implementation of the Haiku operation system.
- Implemented file creates, stat updates, unlinking, fs info updates in **C++** and added Doxygen documentation.

## TECHNICAL SKILLS

- **Programming Languages:** Java, C/C++, Racket, Scheme, Python, OCaml, Haskell, Coq, JavaScript.
- **Misc:** MongoDB, Elasticsearch, Kubernetes, Spring, Gradle, Graylog, Vim, git,  $\text{\LaTeX}$ , shell utilities.

## PROJECTS

- **imin:** nanopass compiler for a subset of **Scheme** to **x86-64** in **Racket** with a graph coloring register allocator and copy garbage collector. Implemented following a draft of the textbook *Essentials of Compilation*, made [contributions](#) to the textbook.
- **mk-dinterp:** **relational interpreter** for a subset of **Scheme** in **miniKanren** capable of program synthesis.
- **Search engine:** Implemented parser, indexer, and TF-IDF search for 40GB Wikipedia corpus in **C++**.
- **ohhttp:** Server for a subset of HTTP using **socket programming** in **OCaml**.
- **SimpleFS:** file system in **C++** capable of file creation, deletion, read, write, mount, etc.

## EDUCATION

**IIIT Hyderabad**

*CGPA: 8.58/10*

**B.Tech. and M.S. by Research in Computer Science**

*August 2019 to December 2023*

**Relevant coursework:** Principles of Programming Languages Algorithm Analysis & Design, Computer Systems Engineering-1, Design and Analysis of Software Systems, Program Verification

## RESEARCH PUBLICATIONS

- *An Annotated Implementation of miniKanren with Constraints.* **Bharathi Ramana Joshi**, William Byrd. Published at [miniKanren Track, ICFP 2022](#). [Preprint link](#).
- *metaKanren : Towards a Metacircular Relational Interpreter.* **Bharathi Ramana Joshi**, William Byrd. Published at [miniKanren Track, ICFP 2021](#). [Preprint link](#). [Talk link](#).