

# Rachna Raj

PhD Student in Software Engineering with 4+ years of experience in Java-based backend systems and long-term software maintenance. My research empowers open-source maintainers through real-world usage analysis and automated test generation. Skilled in static analysis, test generation, LLMs, & data-driven decision-making.

## CONTACT DETAILS

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## PERSONAL INFORMATION

Citizenship: **Indian**  
Family: **Single**  
Languages: **English, Hindi**

## SKILLS

- **Languages:** Java, Python, C++  
MySQL, PostGreSQL, FireBase, GraphQL
- **Frameworks:** Spring Boot, JUnit, RESTful API
- **Project Management:** Jira, Agile and Scrum, SDLC
- **Developer Tools:** GitHub, Docker, VSCode, IntelliJ, Postman, STS, SonarQube, Google Colab, Terraform
- **AI & ML:** Prompt Engineering, LLM Fine-Tuning, Deep Learning, Federated Learning

## ACHIEVEMENTS

- ◊ Best Student Presentation Award, MSR 2024
- ◊ Hackathon Winner, IBM 2023 (AI Employee Assistant)
- ◊ Infosys Rise/Insta Awards, 2021
- ◊ Gold Medalist, NERIST (2015–2019)
- ◊ Top 30, Aarya Janani Civilisation Contest, 2022

## MEMBER

**REALISE Lab**, Concordia University  
**CREATE SE4AI**, NSERC Training Program in AI-based Software Engineering

# INDUSTRY EXPERIENCE

- SOFTWARE DEVELOPER, IBM (India)** **2022.03–2023.07**  
◊ Built and maintained SPM and Child Welfare modules using Curam.  
◊ Resolved OSS security vulnerabilities by consolidating dependencies and optimizing builds.
- SENIOR SYSTEMS ENGINEER, Infosys Limited (India)** **2019.12–2022.03**  
◊ Implemented Provider Life-cycle modules for Helix healthcare platform.  
◊ Developed scalable RESTful APIs with Spring Boot; explored GraphQL vs REST through POCs.  
◊ Optimized backend reliability, performance, and integration.
- GRADUATE ENGINEER, Electrosteel Steels Ltd. (India)** **2019.06–2019.12**  
◊ Developed Android app for digitizing production reporting workflows.  
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# RESEARCH EXPERIENCE

- RESEARCH ASSISTANT, Concordia University** **2024.09–2025.04**  
◊ Conducted research on EDI in education in the era of LLMs as part-time
- TUTORIAL INSTRUCTOR, Concordia University** **2024.09–2024.12**  
◊ Delivered tutorials on designing AI-based software systems for Ericsson professionals.
- PROJECT SUPERVISOR, Concordia University** **2024.05–2024.08**  
◊ Supervised NSERC-funded intern on ChatGPT for library migration and troubleshooting.
- TEACHING ASSISTANT, Concordia University** **2024.01–2024.04**  
◊ Graded assignments and provided feedback on LLM research papers for SE students.

# EDUCATION

- PHD, SOFTWARE ENGINEERING, Concordia University** **2024–2028**  
◊ CGPA: 4.3/4.3
- MSC, APPLIED COMPUTER SCIENCE, Concordia University** **2023–2024**  
◊ CGPA: 4.1/4.3
- BTECH, CSE, NERIST, India** **2015–2019**  
◊ CGPA: 8.85/10

# CURRENT PROJECTS

- ◊ Fine-Tuning LLMs for Automated Test Generation for Software migration
- *Developing test generation techniques with LLMs to support software migration and detect breaking changes.*
- ◊ Tool support for OSS maintainers
- *Developing tools to help open-source maintainers understand usage and testing of their libraries for informed decision-making*

# OTHER PROJECTS

- ◊ Federated Learning for Privacy in Crowd Sensing
- *Designed a privacy-preserving framework for mobile crowd sensing using FL.*
- *Compared performance with traditional ML to improve IoT data inference.*

# PUBLICATIONS

- ◊ THE ROLE OF CHATGPT IN DEVELOPER CONVERSATIONS, MSR 2024
- ◊ AI-DRIVEN NLP IN MULTILINGUAL SOCIETIES (BIBEKI), IFGT 2025
- ◊ SUPPORTING OSS MAINTAINERS WITH COMMUNITY ANALYTICS, Under Review