

# Rini Banerjee

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## EDUCATION

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**University of Cambridge** Oct 2022 – Present  
PhD in Computer Science

- Supervisors: Prof Peter Sewell & Dr Neel Krishnaswami

**Imperial College London** Oct 2018 – Jun 2022  
MEng Joint Mathematics & Computer Science (JMC)

- Achieved **first-class honours** overall
- Awarded **ARM Project Prize** for Master's thesis, "*Software Transactional Memory for Non-Volatile Memory*"
- *Modules of interest*: Scalable Software Verification, Software Reliability, Type Systems

## RESEARCH EXPERIENCE

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**Research Intern (Industrial Placement)** Jun 2021 - Sep 2021  
*Huawei Technologies Research & Development UK (Supervisor: Dr Martin Berger)*

- Developed several tools for **Sail**, a specification language that describes the ISA semantics of processors
- Implemented a symbolic execution testing framework for Sail specifications, using OCaml and Python's **Z3** API
- Opened a number of **GitHub issues** which led to bug fixes within Sail compiler and additional user documentation to be written

**Undergraduate Research Student (UROP)** Jul 2020 - Sep 2020  
*Imperial College London (Supervisors: Prof Paul Kelly & Dr Gerard Gorman)*

- Worked on the **Devito Project**; Devito is a domain-specific language for symbolic computation in Python
- Led a team to create the **Devito Book**, a set of Jupyter Notebook tutorials in Devito that teach the finite difference method for solving partial differential equations (PDEs)
- Re-implemented existing NumPy PDE solvers using Devito and configured CI/CD for testing & deployment
- Wrote a **Microsoft technical blog** about my experience

**Undergraduate Research Student (UROP)** Jul 2019 - Aug 2019  
*Imperial College London (Supervisor: Dr Soteris Demetriou)*

- Created an Android app using Java that monitors user security behaviours on mobile devices
- Gained familiarity with Android components such as BroadcastReceivers, Listeners & Handlers
- Co-authored a **related paper**, introducing the Smartphone Security Behavioral Scale (SSBS)
- Wrote a 30-page **technical report** detailing my work

## TEACHING EXPERIENCE

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**Undergraduate Teaching Assistant** Oct 2020 - Apr 2022  
*Imperial College London*

- Personal Maths Tutor for first-year Joint Mathematics & Computer Science students
- Responsible for leading weekly small-group tutorial sessions and providing marks & feedback on tutorial sheets
- *Modules*: Logic, Reasoning About Programs, Graphs & Algorithms, Discrete Mathematics

## PUBLICATIONS

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1. Hsiao-Ying Huang, Soteris Demetriou, **Rini Banerjee**, Guliz Seray Tuncay, Carl A Gunter, Masooda Bashir. "Smartphone Security Behavioral Scale: A New Psychometric Measurement for Smartphone Security". arXiv pre-print: [arXiv:2007.01721](https://arxiv.org/abs/2007.01721)

## HONOURS & AWARDS

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<b>ARM Project Prize</b> <i>Awarded to an outstanding final-year thesis in the area of computer systems</i>	July 2022
<b>Dean's List (Year 3)</b> <i>Awarded to the top 10% of the cohort</i>	July 2021
<b>Corporate Partnership Programme Group Project Prize</b> <i>Awarded to an outstanding Year 3 group project for software engineering excellence</i>	February 2021
<b>IBM Second Year Group Project Prize</b> <i>Awarded to one group in Year 2 cohort for the best third term web app project</i>	June 2020
<b>Mercers' School Memorial Prize for Academic Excellence</b> <i>Awarded to one student upon leaving school for general academic excellence</i>	July 2018
<b>United Kingdom Mathematics Trust: Senior Team Challenge</b> <i>Won regional round (Nov 2017) and came in top 25% in national final (Feb 2018)</i>	2017-18

## PROJECTS

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<b>VAlgoLang</b>	Oct 2020 - Jan 2021
<ul style="list-style-type: none"><li>• Created an open-source <b>educational tool</b> that generates animated videos of algorithms using <b>Manim</b></li><li>• Used Kotlin with ANTLR4 to develop novel interpreter, and gained familiarity with Manim library for backend</li><li>• Reduced number of lines of code needed to produce animations by 95% on average</li><li>• Won the Corporate Partnership Programme Prize for software engineering excellence (link to <b>final report</b>)</li></ul>	
<b>Lime</b>	May 2020 - Sep 2020
<ul style="list-style-type: none"><li>• Created <b>Lime</b>, a web application designed to improve the experience of live events for hosts and attendees</li><li>• Used Ionic framework with React &amp; TypeScript for frontend, and Spring Boot &amp; Kotlin for backend</li><li>• Came <b>1st</b> out of 48 groups and won the IBM Second Year Group Project Prize (link to <b>final presentation</b>)</li><li>• Used by Department of Computing at Imperial for onboarding new students and for internal open day</li></ul>	

## SKILLS, ACTIVITIES & INTERESTS

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<b>Programming</b>	Java, Kotlin, Haskell, Python (incl. NumPy), OCaml, C, JavaScript
<b>Tools</b>	Git, Docker, CI/CD (incl. GitHub Actions), L <sup>A</sup> T <sub>E</sub> X
<b>Languages</b>	English & Bengali
<b>Leadership</b>	Imperial College Women & Non-Binary Individuals in Computing (2021-2022), Academic Year Representative (2019-2021)
<b>Extracurricular</b>	ABRSM Grade 8 piano, Indian classical vocal music, charity work

Last updated: August 2022