Shardul Chiplunkar

website: etaoin-shrdlu.xyz
phone: +41 79 637 7587
email: shardulc@proton.me

Education

2022 – EPFL (École Polytechnique Fédérale de Lausanne), *Lausanne, Switzerland*
PhD student in School of Computer and Communication Sciences

advisor: Prof. Clément Pit-Claudel, Systems & Formalisms laboratory (SYSTEMF)

2018 – 22 Massachusetts Institute of Technology, *Cambridge, MA, USA*
GPA 5.0/5.0, S.B. in Mathematics with Computer Science

coursework: theory of computation, symbolic systems, information & entropy, algorithms; computational cognitive science, linguistic semantics & pragmatics, language acquisition; music technology, play translation, Internet policy, copyright law

Technical experience

2021 Engineering & Development intern at The MathWorks, Inc.

- Compiler optimizations for code generation of lower languages (C/C++, HDL, etc.) from MathWorks products, with a foundational impact on customer production code

2019 – 20 Programming Languages & Verification lab (MIT CSAIL)

- Developed a **domain-specific language and verified compiler for Internet firewalls** using correct-by-construction software synthesis and proof automation techniques in Coq
- Presented at Coq for Programming Languages (CoqPL) 2021 (doi:10.5281/zenodo.4316324)

2020 – 21 Computational Cognitive Science lab (MIT BCS)

- Modeling human intelligence and learning as symbolic program inference

2020 Intern at Causality In Cognition lab (Stanford Psychology)

- Probabilistic programming languages and physics simulations to model human causality cognition

2018 – Mathematics teaching

- TA for combinatorial game theory camp, winter 2020, under Simon Rubinstein-Salzedo
- Co-organizer and instructor at Monsoon Math Camp 2020, online high school math program
- Junior counselor at Summer Program in **Applied Rationality and Cognition** (SPARC) 2020
- Taught six-session courses on "Mathematical Logic" and "Mathematics of Music" at MIT HSSP

2014 – 18 Contributor to Apertium, open source machine translation platform

- Contributed primarily to web infrastructure for machine translation services
- Coauthored and presented a technical report at LoResMT 2018 (aclweb.org/anthology/W18-2207)
- Mentor for projects in Google Code-In 2018 and 2019 (open source development contest for high-schoolers) and Google Summer of Code 2018 (open source internships for undergraduates)

Teaching experience

2023 – Teaching assistant for EPFL CS-214 Software Construction

- (in progress) Helping develop first ever iteration of the course, covering fundamentals of functional programming, software engineering, and parallelism

2023 Teaching assistant for EPFL CS-206 Parallelism & Concurrency

- Ran **weekly recitations/exercise sessions**, designed and graded exams, provided 1-on-1 problem-solving, programming, and debugging help, and helped with logistics for a course of **300 students**

2021 – 22 Teaching assistant for MIT 6.009 Fundamentals of Programming

- **Helped students 1-on-1 solve and debug extensive weekly lab assignments** covering fundamental concepts like recursion and data structures; designed and graded lab assignments and quizzes; and helped set course policies for a course of **300–500 students** per semester

2018 – 21 Mathematics teaching

- TA for combinatorial game theory camp, winter 2020, under Simon Rubinstein-Salzedo
- Co-organizer and instructor at Monsoon Math Camp 2020, online high school math program
- Junior counselor at Summer Program in Applied Rationality and Cognition (SPARC) 2020
- Taught six-session courses on "Mathematical Logic" and "Mathematics of Music" at MIT HSSP, and miscellaneous smaller courses at MIT Splash and Spark
- Occasional lessons on miscellaneous Olympiad-level topics at Bhaskaracharya Pratishthana, Pune

Publications

2023 *(technical report)* "Diagramming for programs and proofs", EDIC research proposal, EPFL, Jun 2023.

2023 *(technical report)* "Two case studies for diagramming", SYSTEMF semester project report, EPFL, Jun 2023. etaoin-shrdlu.xyz/writing/two-case-studies-diagramming.shtml

2023 *(technical report)* "Building a TASTy interpreter", LAMP semester project report, EPFL, Feb 2023. etaoin-shrdlu.xyz/writing/building-tasty-interpreter.shtml

2021 **Chiplunkar**, Pit-Claudel, Chlipala. "Automated Synthesis of Verified Firewalls", The Seventh International Workshop on Coq for Programming Languages (CoqPL 2021), doi:10.5281/zenodo.4316324

2021 *(non-author contributions)* Gerstenberg and Stephan. "A counterfactual simulation model of causation by omission", *Cognition*, 2021, doi:10.1016/j.cognition.2021.104842

2018 Cherivirala, **Chiplunkar**, Washington, Unhammer. "Apertium's Web Toolchain for Low-Resource Language Technology", Workshop on Technology for Machine Translation of Low Resource Languages 2018, aclweb.org/anthology/W18-2207

Honors

2022 NSF GRFP (Graduate Research Fellowship Program) awardee

2022 MIT EECS Undergraduate Teaching Award

2021 Profile featured on MIT News (link)

2021 Rhodes Scholarship nominee

2017 Honorable Mention, International Linguistics Olympiad (IOL)

2017 1st place (national), *Le Grand Concours* French contest

2017 Grand Prize Winner, Google Code-In 2017

2016 1st place (national), Panini Linguistics Olympiad

Service & leadership

2023 — PolyDoc, EPFL PhD students' association
Representing PhD students in EPFL administration and organizing social events

2020 – 22 — MIT Committee on the Undergraduate Program
Governance committee overseeing **undergraduate academic structures, policies, and programs**, and encouraging experimental innovation

2022 — MIT MacVicar Faculty Fellows Advisory Committee
Nomination committee for the Margaret MacVicar Faculty Fellows Program, recognizing exceptional undergraduate teaching

2022 — MIT Committee on Student Life
Governance committee overseeing the learning and living environment at MIT, including **student housing, food security and dining services, mental health and student support services, diversity & inclusion initiatives,** and support for student organizations

2021 – 22 — MIT Campus Activities Complex Advisory Board
Advisory board for management of campus performance & event spaces, facilities, and equipment

2021 – 22 — MIT Living Group Council
Leadership council for Independent Living Groups (ILGs) at MIT, representing pika

2020 — Chair, MIT Educational Studies Program (ESP)
Mentored team members, interfaced with MIT administration and the public, and managed shift to online operations (due to COVID-19) for student organization that runs **educational events serving over 5,000 students annually** from local high and middle schools

2018 – 20 — Panini (Indian National) Linguistics Olympiad
Chair of Problem Committee to **design & test-solve national linguistics contests**, 2019 and 2020, and **trainer for Team India** for the International Linguistics Olympiad, 2018 and 2019