DHRUV MAKWANA

PHD CANDIDATE, COMP. SCI.
UNIVERSITY OF CAMBRIDGE

DC-MAK.GITHUB.IO

LONDON, UK

I am open to any work at the intersection of elegant abstractions, technical infrastructure problems and readable, working code. So far, I have focused on tooling performance [C,J,P], types [H], and verification [A,B]. I'm enthusiastic about supporting others: I've trained new hires and mentored interns [G,K], given talks [C,J], made educational videos [S], and taught undergrads [R,U,V] and children [T].

Research

A. PhD Thesis (full draft): *On the Theory and Engineering of Verifying Systems C*
B. POPL'23 – *CN: Verifying Systems C Code …* and POPL'25 – *Fulminate: Testing … Specifications in C*
C. ECOOP 2019 – *NumLin: Linear Types for Linear Algebra*
D. Report – *Implementing Balanced Polling for OCaml* (explored safe-points for multicore OCaml)

Employment

University of Cambridge | PhD Student in Computer Science | Apr 2020 – Present

E. Published research (A,B), contributed to open-source (O,P), and taught undergrads (R)
F. 2-10x speed-up in CI pipelines, with fine-grained output checking
G. Streamlined onboarding: wrote explainers, recorded video overviews, and triaged project issues

Meta, London | PhD Software Eng Intern, Hack Type-checker, Dev Infra | Jul – Sep 2023

H. Reduced risk of disruption to www.facebook.com with stricter switch check in Hack (GitHub)
I. Result: improved robustness of 98.5% of 170K switches; signaled potential errors in rest

Goldman Sachs, London | Analyst (Software Developer), SecDB Architecture | Jun 2018 – Mar 2020

J. Explored feasibility of Slang running on Truffle/GraalVM: talk at Curry On (2019)
K. Supervised intern project (gRPC for Slang) and training (Java and Slang/SecDb)
L. Interviewed candidates & improved hiring (updated job spec, encouraged work-representative questions)

Arm, Cambridge | Verification Engineer, CPU Group | Jun – Aug 2017

M. Set-up a new workflow for model-checking undefined decoders
N. Verified (model-checking) undefined decoders on two released processors for two different architectures

Open-Source Contributions

O. CN and Cerberus: memory model, UX improvements (errors, LSP, VS Code), refactored parser
P. c-tree-carver: Clang-based tree carving tool for C/C++
Q. (Ongoing) Raven ML framework for OCaml: implementation of einsum (GitHub)

Teaching

R. Undergrad – OCaml, Discrete Maths, Java, C/C++, Prolog, Compilers, Types, Semantics, Complexity Theory
S. ATypical CompSci – YouTube series to teach functional programming, targeted at 1st years
T. CoderDojo – programming in Scratch and Python for young children and teenagers
U. Global Wellbeing reading group: created and ran two rounds, inspired spin-off courses
V. Aurelius Society: taught Stoic philosophy via discussion groups, socials, and talks

Activities

Within the Plant-based Cambridge campaign, I organized a talk with 30K views online and led Divestment work. At the Aurelius Foundation, I speak and write on Stoicism as a Youth Ambassador. As treasurer of Cambridge University Bollywood Dance Troupe, I recovered £450 in lost funds. I volunteer with local animal rights groups and enjoy cooking (specializing in vegan Gujarati cuisine).