

# MADHAV BENOI

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## OBJECTIVE

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Passionate about all things Computer Science, especially: Cybersecurity, Programming and Maths. Looking for Security related roles, preferably Vulnerability research or offensive security, but also up for Software engineering roles.

## EDUCATION

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**BSc Computer Science and Mathematics**, University of Edinburgh

2019-2023

Relevant Courses :

- Computer Architecture and Design : Designing a CPU in a hardware descriptor language, branch predictor, low level concepts in depth like from CPU pipeline, computer design, out of order execution and fast addition/multiplication algorithms. Programming in RISC-V.
- Compiling Techniques : Practical experience in what goes into writing a compiler and all the stages. Coursework had to learn to write a parser, type checker and backend optimisation.
- Operating Systems : Learnt about what goes into designing an operating system, wrote a scheduler, allocator and a user driver as coursework.
- Blockchain Distributed Ledger : Learnt all about blockchains, and it's security vulnerabilities .Security attack against smart contract like Reentrancy attacks.
- Computer graphics : C++ programming to write a raytracer from first principles.
- Types Semantics and Programming Languages : Proof assistant language AGDA, good understanding of lambda calculus and creating typing rules, and using proof assistants to prove maths problems.
- Maths Courses : Algebraic Geometry, Commutative algebra , Group theory, Honours algebra and Honours Differential equation, I am mostly interested in Abstract algebra, took a lot of these courses to have deeper understanding of Cryptography Primitives.

## EXPERIENCE

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**Teaching Assistant and Tutor for Computer Security Course**

Dec 2022 - May 2023

University of Edinburgh, Informatics

*Edinburgh, United Kingdom*

- First undergraduate student to be given permission to be a Teaching Assistant for a year 3 mandatory course for Computer Science Students at the university.
- Designed new challenging material for the coursework which will be used as mandatory teaching material now and years to come. Mainly designed, Cryptography and Software Security Coursework, which involved binary exploitation challenges using pwntools.
- Tutored students about Operating systems security and Cryptography.

**President**

Sep 2022 - Present

SIGINT, Cybersecurity Society

*Edinburgh, United Kingdom*

- Founder of the first student-led CyberSecurity Conference at University of Edinburgh. My proudest achievement, I was heavily involved in making this possible, raised almost £23,000 in sponsorship, got popular speakers to talk about technical topics. This involved managing several parties, like University students, speakers, businesses and even bureaucracy at our university. Got students from top UK university teams like Oxford, Cambridge, Warwick, Sussex, Birmingham, and Glasgow in attendance. Communication amongst the committee, University, and several parties had to work as a team for it to all go smoothly.
- Managing and running, workshops, CTFs and several society events. Working as a team to run these events.

- Wrote several Cryptography, reverse engineering and binary exploitation challenges for our flagship Capture the flag competition pwnEd.
- Participated in several Capture the flag competitions, 1<sup>st</sup> place in HackTheBox University CTF 2021, 1<sup>st</sup> in LTDH 2021, 2<sup>nd</sup> in Auth-zero CTF 2022, 2<sup>nd</sup> in Securi-tay 2023 CTF, 1<sup>st</sup> in G3C CTF 2022.

**Security Auditor,**  
BCryptic LLC

Nov 2021 - Present  
*Remote*

- Audited several largescale codebases written in C and haskell. Listened to and learnt from experienced members.
- Wrote bug reports about findings.

**Meta/Facebook's BountyConEDU**  
Meta

April 2022  
*Madrid, Spain*

- Invited from pool of thousands of applicants to attend the first European BountyConEDU hosted by Meta, in Madrid, Spain for 3-day conference for university students.

**Current Member of the CTF Team, Organizers (2022 1st in CTFTIME leaderboard ranking)** 2022 - Present

## PROJECTS

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**Ex Top 20 CryptoHack Player :** I was in the Top 20 in the leaderboard for CTF style cryptography challenge website, Cryptohack. I have several cryptography attack implemented in Python and Sagemath. Can be provided and talked about if asked (as solutions to the challenges are not be to posted publicly) [My account](#).

**pwn.college and other challenge website scripts** Several technical challenges about Binary exploitation and Reverse engineering. I also learnt quite in depth about concepts in reverse engineering. Also written several shellcoding programs (in x86 and arm) for the challenges on pwn.college.

**Gameboy emulator in rust** A work in progress emulator that I have to finish.

**Drone delivery System** A programming coursework I had to do in University in year 3, which involves writing a drone that does pathfinding using A star algorithm, and implemented Christofides algorithm for Traveling Salesman Problem, also committed the results in database using prepared SQL statements. [Link to this](#).

## SKILLS

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**Programming languages :** Python, Sagemath, C/C++, asm, Java, Agda, Haskell, Git, Bash, Linux, Flask  
**Languages :** Bilingual in English and Malayalam  
**Soft-skills :** Problem-solving, Leadership skills

## EXTRA-CURRICULAR ACTIVITIES

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- Enjoy cycling and trying to be more atheletic by getting into sports.
- Love geeky things like videogames.