Nicholas Marks

Personal Information

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Education

2023 Bachelor of Engineering (Exchange) | Majors: Electrical/Computer Engineering, **Purdue University, Indiana USA**

2020 - Now Bachelor of Science | Majors: Computational Science, Pure Mathematics, **Monash University, Victoria**

2020 - Now Bachelor of Engineering (Honours) | Major: Electrical Engineering, **Monash University, Victoria**

2010 - 2019 **Scotch College**, Hawthorn, Victoria

2006 - 2010 **Lloyd Street Primary School**, Malvern, Victoria

Work Experience

Feb 2022 - Now | Monash Young MedTech Innovators
Software Developer
I am part of a small team of software students developing a cloud-based web-app integrated across a university medical platform to serve as a collaborative and communicative tool between healthcare staff and clients. The project will use AWS cloud services such as Amplify, DynamoDB, Cognito and OpenSearch, Apollo GraphQL in the API layer and React with TypeScript in the frontend layer.

Jul 2021 - Now | Monash Carbon Capture and Conversion (MC^3)
Polymer Synthesis Project Manager
I am working in MC^3 to produce a project entry to the XPRIZE Carbon Removal competition. My team is developing a solution that utilises an electroreduction of carbon dioxide into ethylene and then a gas-phase process to polymerise the ethylene into high-density polyethylene plastics. This forms the end pipeline of a full carbon conversion system that begins with a novel direct air capture (DAC) treatment of CO_2. In the student awards stage of the competition, MC^3's entry placed in the top 23 globally, and hence the project was awarded US$250,000 for future funding.

Mar 2021 - Now | Monash DeepNeuron
Project Member of HPC Team
I am working on projects in the field of high-performance computing with other students from my university. This has primarily involved competing in computing competitions that test the ability to build and bench-mark scientific and deep learning applications, then working on optimising these builds for performant compilation and scalability. I have in doing so spent a lot of time working with various compilers, build tools, parallelisation techniques and technologies such as OpenMP.

Dec 2019 - Feb 2022 | Edrolo
Physics Textbook Author

Edrolo is a technology startup dedicated to improving the quality of education in Australia. I work there as a co-author for the 1st edition of a Victorian Curriculum of Education (VCE) Units 1/2 (Year 11) Physics textbook as well as the 2nd edition of the Units 3/4 (Year 12) textbook, both of which were used in classrooms across the state of Victoria. This role involved me writing lesson theory, questions and sample exams for the physical version of the textbook, as well as recording worked solutions and producing digital question sets for the online version.

Oct 2019 - Mar 2020 | Foot Locker
Senior Sales Representative

Worked as a sales representative for the Foot Locker at Chadstone Shopping Centre. I was responsible for managing Adidas product and leading the floor workers through the Christmas/holiday shopping period.

2014 - 2019 | FIBA Basketball Official (A Grade)
Referee and Stadium Supervisor

Trained as a basketball referee officiating games ranging from weekend domestic competitions to men's and U18 boys representative matches. I also worked as a stadium supervisor for these competitions as well, which involved training younger referees, ensuring smooth operation of matches and dealing with complaints from parents, players and coaches.

Competitions

May 2022 | ISC22 (Student Cluster Competition)

This cluster competition focused on optimising builds of scientific applications. I worked on a Fortran project called XCompact3D, which is a high-order flow solver for academic research, in particular dedicated to Direct and Large Eddy Simulations that discretises Navier-Stokes equations of fluid fields to solve turbulent dynamics. I was required to bench-mark various simulations across multiple nodes, and rewrite the source code to make use of new OpenMP features like `OPENMPI_ALL_TO_ALL` for better parallel performance and scalability.

Nov 2021 | IndySCC21 (Student Cluster Competition)

A virtual cluster competition run in parallel to SC21. The competition consisted of building and benchmarking a series of applications including Gromacs, Linpack, HPCG and John The Ripper. This allowed me to gain further proficiency with build tools including CMake and Cuda, and other HPC technologies such as OpenMP. The competition concluded with a 48-hour hackathon including technical interviews. The Monash team finished in 2nd place overall.

Jul 2021 | A-HUG Cloud Computing Hackathon (ARM Processors)

A week long hackathon centred around HPC application porting and cloud optimization using Arm architecture. This involved being given one small and one large mystery application to performance tune through compiler, optimization and library flags, amongst other parameters.

Jul 2021 | Accenture MyWizardAiOps Bootcamp (2nd place)

A one week coding intensive in teams of 5 to produce a full stack application catering to a particular user group. Our project took advantage of Amazon IoT devices and a serverless AWS cloud architecture to power a dashboard for bee farms monitoring a large number of hives.

Awards & Accomplishments

2018 - Dec 2019 | **School Captain of Scotch College**
This position is awarded to a student from the graduating class to be taken up as a full-time position the year after. As part of my duties I chaired the council of student captains for other Victorian schools, as well as being a board member of the school's alumni council.

Dec 2018 | **Co-dux of school, Dux of Literature**
Received the prize of co-dux for graduating with an ATAR of 99.95, as well as the prize for Year 12 Literature having received the best study score in the cohort.

Nov 2018 - Feb 2019 | **SAGSE Scholarship for German Language Exchange**
I was awarded 1 of 12 scholarships to Victorian students studying German to participate in a 3-month language and cultural exchange in Germany. Since returning, I have joined the alumni committee which facilitates future sponsorship of the awards, alumni events and hosting of German students in Australia.

Australian Physics Olympiad
Received an award of high-distinction for the Australian Physics Olympiad qualifying exam.

Languages

German: C1 Level (Goethe-Institut)

Software

Frontend:	JavaScript (HTML & CSS), React, NextJS, Gatsby, Hugo
Backend:	DJango, Node.js, GraphQL, Rust
Languages:	Python, C/C++, SQL (MySQL and Postgresql) MATLAB, LaTeX
AI and HPC:	Pytorch, Tensorflow, OpenMP, CUDA, CMake, Docker
Cloud:	AWS (Amplify)

Interests and Hobbies

Literature, playing the piano, rock-climbing, wood-working, basketball and running. I like to spend my time doing web-design, making a few blog/portfolio websites and some other small projects with friends.