

TEAM INTRO

DeepNeuron SCC team members come from a diverse range of cultural and technical backgrounds. Between our 6 members, we share 4 different nationalities, as well numerous cultural backgrounds. We come from a variety of different areas of study including Commerce, Computer Science, IT, Engineering and Science. All our team has had prior HPC experience through Monash's MASSIVE/M3 supercomputer. With the HPC training we have received, we have a wide spectrum of skills which will apply to make a meaningful contribution to IndySCC. A number of our members have participated in prior SCC competitions. Previous DeepNeuron SCC teams have competed in competitions such as SC18, IndySC-21 as well as ASC21, where they won first place in "Best Mystery App". With our prior experiences and combined skill set, we are confident in winning the competition this year!

ABOUT US

Monash University is an Australian public research university that was founded in 1958. Primarily located in the greater Melbourne region it has four campuses located in Victoria, Australia. In addition, it has multiple international campuses which are located in the countries of Malaysia, China, Italy and more! Monash currently is the largest university in Australia and has a vibrant and diverse community. DeepNeuron (<https://www.deepneuron.org/>) is a student team focused on improving the world with Artificial Intelligence (AI) and High-Performance Computing (HPC). With more than 80 members, we encompass a myriad of talented internal teams - Deep Learning, HPC, Marketing, Outreach and the Law & Ethics Committee. Our technical teams partner with researchers from various fields to design custom AI or HPC solutions, as well as compete in international competitions. The SCC team is dedicated to making a valuable contribution to IndySCC22.

PREPARATION

Our team arranged regular weekly meetings in preparation for the competition. Our supervisor Simon covered various HPC concepts such as parallelization, openMPI, openMP, compiling and Makefiles with the team. These skills were put into practice via assignments to be completed on the Monash M3 cluster. We covered the use of various software technologies that can be used to assist us during the competition such as GitHub, Slurm and Spack. As the competition approaches, we have also started investigations into real life applications. We have studied their use cases, inputs and compilation methods in order to increase our understanding of the topics.

TECH STACK



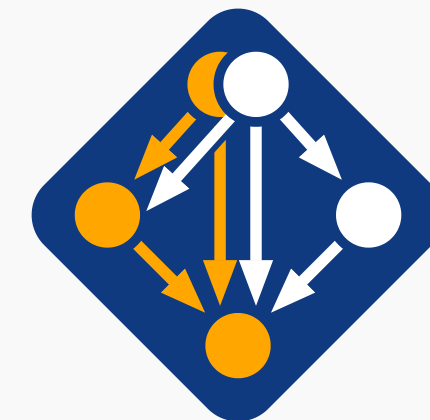
Ansible
Reproducible OS configurations across nodes via Ansible | OpenStack.



Ubuntu
Used Ubuntu | CentOS as the host platform.



Slurm
Batch job scheduling via Slurm. Used to deploy HPL jobs across nodes.



Spack
Package and dependency management was achieved using Spack | Environment Modules.



Git
Software version control system using Git enabling the distribution of configuration files across team members.



Microsoft Teams
Communication and resource sharing was achieved through Microsoft Teams.



MASSIVE



M3 MASSIVE
Data processing engine

WHY WE WILL WIN

Through our preparation and training we have developed extensive HPC knowledge that gives us the confidence that we can tackle the challenges of IndySCC. Individuals in our team specialise on particular topics according to their interests and skills, but we also ensure that all members can tackle any specific HPC problem thrown at us. Our group's established history inspires us to be an efficient and cohesive team, and we foster an open and trusting atmosphere. In addition we can draw upon the the help and support of the greater DeepNeuron network if we need further assistance. During the team's training we have developed significant experience with "Nectar", Australia's Openstack national research cloud computing infrastructure (<https://ardc.edu.au/services/nectar-research-cloud/>). This allows us to use the competition's 'Chameleon Cloud' comfortably, and to focus our energy on the new software and frameworks which we will be working with.

MEET THE TEAM



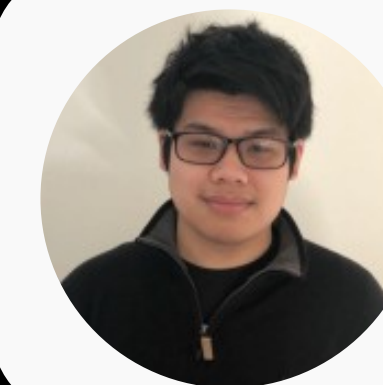
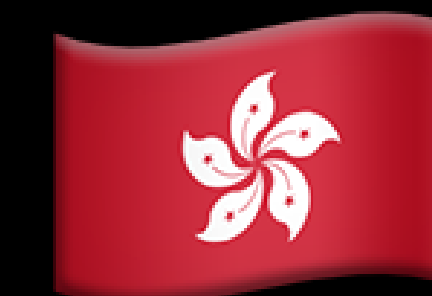
Simon Michnowicz

Works at Monash eResearch performing HPC devops and user engagement. Passionate about the SCC and its ability to mentor the next generation of HPC specialists.



Joseph Ward

Third-year computer science and physics student and is acting as the project manager for the competition. Providing an organisational and managerial skill set.



Pascal Chung

Second year computer science and commerce student. Knowledgeable in cloud concepts and was a part of the previous IndySCC21 team.



Raymond Zhang

Fourth year electrical engineering and physics student. Has experience using Slurm for research projects, looks forward to learning more from this competition.



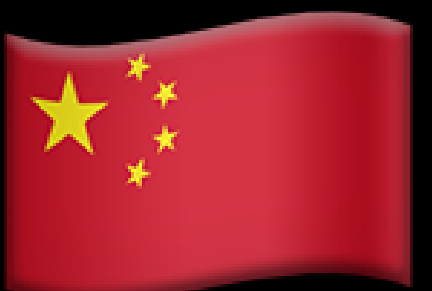
Tyler Swann

First year software engineering and computer science student. Has been working in C++ for three years and has experience in software library design.



Hanbing Li

Fourth year robotics engineering student. Knowledgeable in deep learning and looks forward to receiving more knowledge from IndySCC.



Daniel Hong

Second year robotics engineering and finance student. Previously been to SC18 and looks forward to taking part in this competition.