PRESS RELEASE

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2018 APAC HPC-AI Student Competition Sharpens Weather Forecast Accuracy and Image Recognition to Deliver Improved Real-Life Results

Co-Organized by The National Supercomputing Centre (NSCC) Singapore and HPC-AI Advisory Council, The Competition Brought Together 18 Student Teams from 7 Asia Pacific Countries for a 5-Month Challenge

The Competition Yielded Winning Solutions that Can Improve The Real-Life Accuracy for Weather Forecasts and Image Recognition

Participants Utilized NSCC Singapore's ASPIRE 1 (Singapore's Only Petascale Supercomputer) and Were Able to Perform Multiple and Complex Calculations and Simulations, Processing ImageNet Dataset and CONUS 2.5km Data in Under Ten Minutes

Singapore – August 27, 2018 – The HPC-AI Advisory Council, a leading community benefit organization dedicated to high-performance computing (HPC) and artificial intelligence (AI) research, education and outreach, in collaboration with NSCC Singapore, today announced the winning teams of the first Asia-Pacific HPC-AI Competition during a live award ceremony in Singapore. The award ceremony recognized the top three winners and meritorious performers from amongst 18 teams representing prestigious universities throughout Asia-Pacific.

The competition kicked off at Supercomputing Asia 2018, NSCC Singapore's flagship HPC annual conference, on the 27th of March, 2018 by Dr. Janil Puthucheary, the then Senior Minister of State for Communications and Education, and ended on the 13th of August, 2018. The competition saw intense, but healthy, rivalry among 18 university teams from seven countries, and yielded winning solutions for improving the real-life accuracy of weather forecasts and image recognition. Tasked with demonstrating the highest performance on a range of complex HPC and AI applications, China's Tsinghua University team was awarded First Place. Second and Third Place were awarded to the two Taiwanese teams from National Cheng Kung University.

The two primary focuses of the competition were High Performance Computing (HPC) and Artificial Intelligence (AI) applications. For the HPC applications, teams were challenged to achieve the highest simulation speed of the CONUS 2.5km benchmark using the Weather Research and Forecasting (WRF) Model, a very popular weather forecast tool used in by weather research institutes around the world. This application reduces forecasting time while maintaining its level of precision. For AI applications, the competition focused on multi-node distributed training of the ImageNet dataset. Participating teams were challenged to optimise the AI framework and neural network architecture. This is aligned with what the world is now doing in AI, turning technology into real-life applications including smart city and security-related initiatives.

To collect the winner's trophy, the top winning team from China's Tsinghua University had to analyse, evaluate and optimise the performance of multiple nodes, and each node with multiple GPUs, over an intense five-month period. The top winning team also gets to participate in the 2019 International HPC-ISC Student Cluster Competition, to be held in Germany, June 2019.

The second and third trophy-winning teams were the two teams represented by Taiwan's National Cheng Kung University. The fight to the wire was very tight, with all winning teams demonstrating a high level of performance. To further encourage the teams throughout the competition, a special prize for creativity was announced. Teams submitted a video of their five-month journey and were graded based on the video's level of creativity. The special prize-winning team was from Thailand's Thammasat University.

Said Chief Judge and Chairman of the HPC Advisory Council Mr Gilad Shainer, "*The judges were really impressed with the high levels of skill and strategy that participants evidenced throughout the competition period. This made the judging committee's job that much harder, as each team proved to be an equal match with one another. Ultimately, what impressed us most was how such a student competition could yield results to improve the lives of ordinary individuals the world over. The competition proved once again that the availability of HPC resources can empower universities, research laboratories and commercial vendors to develop tomorrow's products and services, from safer cars and airplanes, to more accurate weather and storm predictions, as well as finding new cures. Since HPC and AI applications share the same underlying technologies and infrastructures, new developments in HPC are being adopted immediately for AI, and vice versa, and could also extend to commercial areas including security and smart nation initiatives*."

Mr Shainer added, *"We commend all the teams for their tremendous efforts and achievements demonstrated throughout the months of this competition, and extend our sincere appreciation to NSCC Singapore for their partnership and managing this important region-wide competition. We also thank the competition committee for its support of the competition throughout. It's an incredible opportunity to contribute to the development of the core knowledge and critical skills for the region's new generation of HPC and AI researchers, scientists and professionals, and the council's mission in continuous outreach and education."*

NSCC Singapore's Chief Executive Prof Tan Tin Wee shared, *"If you think that supercomputing competitions are but an exercise conducted in an ivory tower, offering no practical benefits to mankind - think again. This competition supports NSCC Singapore's mission to use HPC to power innovation and champion Asia as a regional supercomputing centre. The winning solutions show clearly how supercomputing can align research, university work and commercial considerations to drive innovation that benefits all. It has been our privilege to be the co-organiser of this event."*

About the 2018 HPC-AI Competition

The 2018 APAC HPC-AI Competition was managed by the HPC-AI Advisory Council and NSCC Singapore in March to encourage students throughout Asia Pacific to showcase their education and hone their expertise in a friendly, yet spirited region-wide competition, comprised of two parts; HPC and AI. The HPC teams were tasked to benchmark the Weather Research and Forecasting (WRF) Model and were scored based on performance and scalability. The AI teams were tasked to run the benchmark based on ImageNet dataset and were scored based on their performance improvement.

AI has rocketed from an emerging idea to a critical domain across industries, interests, disciplines and technologies for its extensive capability and promise – from better and more accurate decision-making from massive amounts of data to enabling deep intelligence and innovation – from science, manufacturing, security and finance to self-driving cars and smart cities.

In parallel, continuous advances in HPC disciplines and technologies are enabling academia, government and commercial industries to develop breakthrough discoveries in new products and services – from safer transportation, accurate storm prediction and weather forecasting, to finding new lifesaving cures, and much more. By sharing the same underlying methodologies, technologies and infrastructures, new developments in HPC and AI are being adopted immediately in both domains.

Supporting Resources:
- Learn more about the APAC HPC-AI Competition
- Learn more about Sponsoring Next Generation HPC Experts
- Become a HPC-AI Advisory Council member
- Follow the HPC-AI Advisory Council on: Twitter and Facebook

For more information and general questions please email info@hpcadvisorycouncil.com

About the HPC-AI Advisory Council

Founded in 2008, the non-profit HPC-AI Advisory Council is an international organization with over 400 members committed to education and outreach. Members share expertise, lead special interest groups and have access to the technology center to explore opportunities and evangelize the benefits of HPC and AI technologies, applications and

future development. The council hosts multiple annual conferences and STEM challenges worldwide including the RDMA Student Competition in China and the Student Cluster Competition in Germany. Membership is free of charge and obligation. More information: www.hpcadvisorycouncil.com.

About National Supercomputing Centre (NSCC) Singapore

The National Supercomputing Centre (NSCC) Singapore was established in 2015 and manages Singapore's first national petascale facility with high performance computing (HPC) resources to support science and engineering computing needs for academic, research and industry communities. Funded by its stakeholders, including Agency for Science Technology and Research (A*STAR), Nanyang Technological University (NTU), National University of Singapore (NUS), and Singapore University of Technology and Design (SUTD), with substantial funding from the Singapore Ministry of Trade and Industry (MTI), NSCC Singapore aims to democratise access to supercomputing. NSCC Singapore works with local and international organisations to catalyse collaborative HPC projects and programmes which support national research and development initiatives, attract industrial research collaborations and enhance Singapore's research capabilities. For more information, please visit https://nscc.sg.