NEWSBYTES

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CORPORATE NEWS

NSCC and ITE broadening the skills sets of professionals

2nd intake of the Certificate of Competency (CoC) in Introduction to High Performance Computing (HPC) was well attended by participants from local universities, government and private sectors.

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Jointly organised by NSCC and ITE College West, the second session of the CoC in Introduction to HPC held on 20 December 2021 at ITE College West was attended by industry professionals, researchers and academia from local universities. Course participants were co-trained by Dr Lee Thong Yan, HPC Application Analyst at NSCC, and Max Chua, Lecturer at ITE College West, on the basic building blocks of HPC and how to access HPC remotely from a virtual platform to experience working on thousands of computing nodes to perform complex program tasks at high speed, which in turn will accelerate the building of deep learning AI applications.

Training accounts with computing resources were provided by NSCC. Upon completion of the course, participants were awarded a CoC in Introduction to HPC as well as a Certificate of Participation by NSCC Singapore.

NSCC and ITE will be holding the third session of the CoC in Introduction to HPC on **23 March 2022** from **9am-5pm.**

At the end of this course, participants will acquire skills and knowledge on:

- Basic building blocks of a supercomputer
- Understanding PBS Job Scheduler
- Use-case & Accessing of HPC
- Environment Setup & File Transfer
- Resource Allocation & Job Submission
- Hands-on AI Project using HPC

Singapore Citizens & Permanent Residents
$60.99

Singapore Citizens aged 40 & above
$22.99

Non Citizens (Full Fee)
$203.30

Fees for this course can be paid using SkillsFuture Credits

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For more information, head over to https://www.ite.edu.sg/courses/course-finder/course/coc-in-introduction-to-high-performance-computing-(hpc).

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Peeking into the lenses of tropical jumping spiders
Researchers at NUS are tapping HPC resources to gain a deeper understanding on the visual systems of jumping spiders in order to discover how species adapt and diversify.

Visual systems in animals allow them to see and make sense of the world based on light and colours. Opsins, the main visual pigments found in the retinas of animals, determines their light sensitivity to the world. Studies have shown that lighting conditions can influence the variability of opsins abundance.

Among the invertebrates family, limited available evidence suggests that jumping spiders have excellent vision and are able to detect ultraviolet (UV) wavelengths as they possess the opsin gene rh3. As such, a team of researchers at the Department of Biological Sciences at National University of Singapore are using whole-genome sequencing of 5 different salticids spiders - Cosmophasis umbratica, Menemerus bivittatus, Phintella vittata, Siler semiglaucus and Telamonia festiva to determine the types of opsins genes that are present in jumping spiders and their light sensitivity in order to offer insights into the genetic basis of the opsins diversification and highlight the plasticity of the UV visual systems.

Credit: Li Daiqin

"We utilised multiple core hours to run multiple programmes that are necessary for our transcriptome analysis. We also made use of modules that were pre-set within the NSCC systems. As we expanded the scope of our project to include more supplementary materials and increased species diversity, there was a corresponding need to increase our storage space in order to encompass the total amount of data that was generated in the course of our research. We are thus very appreciative of the resources provided by NSCC."

Rachel Seah
Research Assistant
Department of Biological Sciences
NUS

The team tapped on NSCC's HPC resources to analyse the RNA and DNA sequences from the spiders and utilised NSCC's platform to assemble the RNA and DNA genome sequences and run their analyses and generate phylogenetic trees to determine the molecular basis and detect changes in the genomic level of the opsins genes.

The results of this research will provide a cohesive, integrative and multi-faceted understanding of how dynamic underlying gene family evolutions are and ultimately how species adapt and diversify. More importantly, the project will provide multi-level integrative training for postgraduate and undergraduate students in a widely covered multidisciplinary environment of cutting-edge research in life sciences and environmental sciences to support national R&D activities.

To find out more about how NSCC's HPC resources can help you, please contact e-news@nscc.sg.

Safely using hydrogen as a fuel
*NUS researchers leveraging supercomputing to explore hydrogen combustion inhibition methods in order to prevent hazards from occurring.*

In recent years, hydrogen fuel has received increased interest due to the increasing need to reduce greenhouse gas emissions from fossil fuel combustions. However, the usage of hydrogen poses a series of challenges and safety issues as accidental hydrogen ignition and combustion could lead to severe hazards. Effective hydrogen combustion inhibition methods thus needs to be explored to prevent hazards from occurring.

A team of researchers at the Department of Mechanical Engineering at National University of Singapore are utilising NSCC's high performance computing resources to study the possibility and effectiveness of fine water mists (less than 20 micrometers) in inhibiting hydrogen combustion based on high-fidelity numerical methods.

Hydrogen detonation wave structure
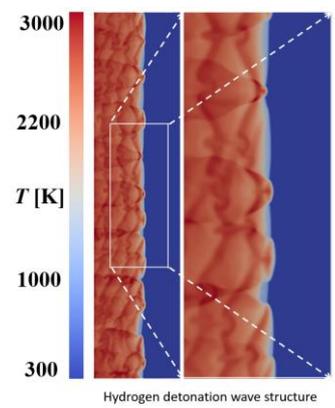
Credit: Zhang Huangwei

"The computational resources from NSCC provides us with the power to unlock the multi-scale and multi-phase dynamics behind the hydrogen combustion phenomena. The high computational speed enables us to quickly capture the unsteadiness of hydrogen ignition, combustion and detonation. NSCC has opened a new way for us to evaluate the potential of hydrogen as a widely-adopted fuel."

Zhang Huangwei
Assistant Professor
Department of Mechanical
Engineering, NUS

Working around 3 different hypotheses, namely hydrogen deflagration flame in fine water mists; hydrogen detonation and inhibition with fine water mists; and turbulent hydrogen combustion, the team aims to make use of the results obtained to lay a solid foundation on the systematic understanding and improvement of the safety of hydrogen usage as a fuel.

The findings will provide scientific evidence for the feasibility of widespread hydrogen adoption and application worldwide to echo the initiative of CO^2 emission reductions.

To find out more about how NSCC's HPC resources can help you, please contact e-news@nscc.sg.

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Shared articles and news from the HPC world.

Singapore to build National Quantum-Safe Network that provides robust cybersecurity for critical infrastructure

Singapore's Quantum Engineering Programme (QEP) will start conducting nationwide trials of quantum-safe communication technologies that promise robust network security for critical infrastructure and companies handling sensitive data.

Supported by the National Research Foundation, Singapore (NRF), the project kicks off with 15 private and government collaborators on board. The new National Quantum-Safe Network (NQSN) will deploy commercial technologies for trials with government agencies and private companies, conduct in-depth evaluation of security systems, and develop guidelines to support companies in adopting such technologies. Read more at NUS News here.

Credit: NUS

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Data Centre Sustainability: Where do we go from here?

From carbon credit greenwashing to PUE and PPAs, data centre operators' approach to mitigating environmental impact needs to evolve.

The past two years have seen the data centre industry go from strength to strength. Even as other sectors have been left reeling by the impact of the COVID-19 pandemic, data centre operators have seen demand double and redouble, driven by increasing digitalisation, cloud, AI, and 5G adoption, and even the pandemic itself. However, while data centre operators find themselves building bigger and faster than ever before, the industry labours in the shadow of a looming climate crisis. Read more at Data Centre Magazine here.

Credit: Data Centre Magazine

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Everyone can have a Cray-1 supercomputer with this Raspberry Pi DIY guide

As long as you have access to a 3D printer.

The launch of the Cray-1 supercomputer was a seminal moment in computing history. The Cray-1 represented a significant leap in computing power, establishing Cray as a supercomputing company giant, and founder Seymour Cray as a tech celebrity. But with the relentless march of progress, the supercomputing crash of the '90s, and the acquisition of Cray by HPE in 2019, the system has faded from relevance, only to be found in museums or conference show floors. Now, however, there is a chance to have your very own Cray-1. Well, at least a miniature version. Read more at Data Centre Dynamics here.

Credit: Data Centre Dynamics

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