

NEWSBYTES

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CORPORATE NEWS

Developing bioinformatics talent and capabilities for Singapore

The international Asia-Pacific Bioinformatics Network (APBioNET) and the local Association for Medical and Bio-Informatics, Singapore (AMBIS) signed collaborations with NSCC to explore joint activities aimed at developing and promoting the use of high-performance computing in the field of bioinformatics.



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Thank you!

LET'S BEGIN

Two collaborations were signed between APBioNET and NSCC as well as between AMBIS and NSCC to strengthen cooperation to develop and upskill the field of bioinformatics in Singapore. The proposed activities include developing high-performance computing (HPC) capability and talent development for bioinformatics, education and outreach as well as strategies to promote the use of bioinformatics and HPC in Singapore's biomedical sector.

The collaboration between NSCC and APBioNET explores the development of HPC-enabled tools and capabilities that can be used by Singapore's bioinformatics ecosystem to upskill and enhance work in this field. Some of the exploratory discussions include potential workflows for data analysis and drug design, adaptation of High-Performance Data Analytics (HPDA) for biological data, High Throughput Computing (HTC) platforms for big data, health and disease-related research, and potentially setting up a virtual computational laboratory for digital transformation.

The collaboration between NSCC and ABMIS will seek to translate the development of these new capabilities to the local context, conduct education and outreach, and to support local HPC-enabled bioinformatics by leveraging ABMIS' network of bioinformaticians and ecosystem.

"As Singapore accelerates its efforts in digitalisation across all sectors, we are excited to collaborate with both APBioNET and ABMIS to explore activities that will help raise the skillset and capabilities of our bioinformatics professionals, and support key sectors like the biomedicine, genomics and healthcare," said Associate Professor Tan Tin Wee, NSCC's Chief Executive. NSCC is a national research infrastructure that has the mandate to develop supercomputing capabilities and provide HPC resources to all of Singapore's research community including those from research institutes, institutes of higher learning, government agencies and companies.

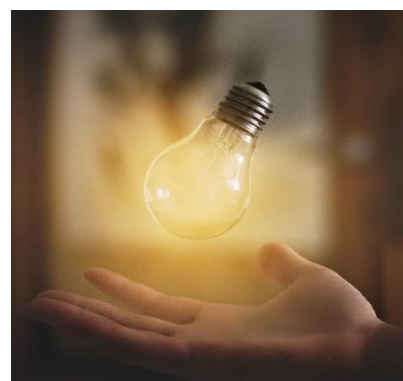
For more information, please refer to the [media release](#).

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NSCC launches High Performance Computing Innovation Challenge for the Environment

Open to research and development communities from government agencies, local enterprises and students from institutes of higher learning, the challenge provides innovators an opportunity to access NSCC's HPC resources and build transformational solutions to key environmental challenges.

Organised by NSCC and supported by GeoWorks, SGTech and SGInnovate the HPC Innovation Challenge aims to enable local organisations and students to innovate using HPC and apply HPC to address one or more of the following areas for our environment:



Enabling a Data-Centric Approach to Manage Our Environment

The technological advancement and greater accessibility of Internet of Things (IoT), networking and satellite technologies are creating new possibilities of gathering new and better-quality data at higher frequencies. We now have more capabilities to monitor important data on our built and natural environments, or precisely track local environmental factors such as rainfall intensity and temperatures. However, these new data opportunities can only be unlocked, if the data is efficiently integrated, processed and analysed to derive useful and actionable insights in a timely manner.



Reducing Carbon Footprint

Singapore targets to achieve a [36% reduction in Emissions Intensity \(EI\) from 2005 levels by 2030](#). Our collective efforts to reduce our carbon footprint have to happen on all fronts, starting with as early as the planning and design stages of property developments. At the same time, we have to find opportunities in existing systems, buildings and infrastructure, and improve on their operations and maintenance.



Planning Our Urban Environment Better

HPC can be harnessed to improve the design and planning of our cities, and thus enhance the quality of life of local communities. Architects, urban planners and municipal service operators are supported by decision-making tools that allow them to navigate the complex needs of diverse populations. Further, these tools can help them analyse and even predict how communities behave and interact in their environments and the services in place, such as traffic management and utilities.



Building Greater Resilience for Climate Change

Adverse weather events, worsened by climate change, will disrupt our everyday lives and business operations. HPC solutions can help simulate the numerous possibilities of future scenarios such as flash floods and haze, so we can better anticipate, prepare for and respond to these events. Also, materials, designs and systems could be tested extensively in simulated environments, so that they can demonstrate their longevity in the difficult conditions, and potential issues are identified at the early stages.

Up to 10 teams will be shortlisted to proceed to the solution development phase and shortlisted teams will receive:

- Access to one of the most powerful supercomputer in Southeast Asia, ASPIRE 2A
- Access to the Supercomputing Digital Sandbox environment that simplifies the development of HPC solutions
- Mentorship and training by subject matter experts

Winning teams will receive:

- Up to SGD5,000 in cash prizes
- A chance to showcase your solution on an international stage
- A chance to be featured in Supercomputing Asia magazine
- Commercialisation and market access opportunity for your solution*
- An internship opportunity at NSCC (Student category only)

**Terms and conditions apply.*



Find out more about the Challenge [here](#) and apply now!

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Supercomputers To The Rescue!

With high performance computing tools, Singapore is bolstering its response to emerging threats such as infectious diseases and climate change.



As the world enters year three of the COVID-19 pandemic, it continues to face the threat of other infectious diseases as well as the multifaceted crisis of climate change. At first glance, the two may sound like important yet disparate challenges. Deeper investigations, however, have increasingly revealed that human health and environmental health are heavily entangled.

For instance, several contagious diseases such as hepatitis A and parasitic infections spread easily in areas with poor sanitation, while air pollution exposure is associated with lung and cardiovascular disorders. Meanwhile, ecosystem destruction and habitat loss can degrade the ability of the environment to control outbreaks, potentially leading to disease-causing agents spilling over from animals to humans.

Losing sight of any of these looming threats could spell grave disaster both in local and global contexts. To understand the intricacies of these emerging hazards, supercomputers are vital tools that could make a big difference to reverse this ominous narrative in Singapore and the world.

Head over to www.nsc.sg/supercomputing-asia-magazine/ to read the full article published in the January 2022 issue of NSCC's Supercomputing Asia Magazine to find out more about how HPC is used as a tool to combat emerging threats such as infectious diseases and climate change.

To find out more about the NSCC's HPC resources and how you can tap on them, please contact e-news@nsc.sg.

Visit www.nsc.sg/case-studies to learn more about how supercomputers are helping Singapore.

This article was first published in the print version of Supercomputing Asia, January 2022.

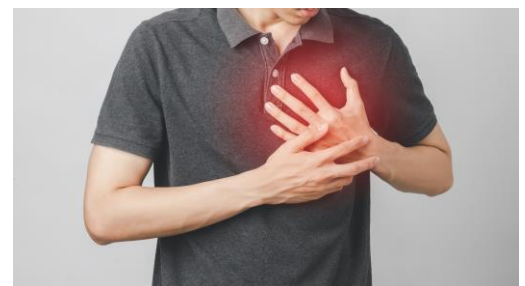
Credit: Tim Hornyak, Writer, Asian Scientist Magazine

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Supercomputer powers research for early detection of heart diseases

Researchers from A*STAR leverage high performance computing for cardiovascular disease stratification for early diagnosis and prevention.

Cardiovascular disease is the leading cause of death globally, taking an estimated 17.9 million lives each year and representing 32% of global deaths. Of these deaths, 85% were due to heart attack and stroke. In Singapore, cardiovascular disease accounts for 31.7% of all deaths in 2020 and 19 people die from heart diseases and stroke each day. This means that almost 1 out of 3 deaths in Singapore is due to heart diseases or stroke.



Over the last decade, technological developments have strengthened the role of non-invasive imaging for detection, risk stratification and management of patients with heart disease. There is a desire in the cardiac magnetic resonance imaging (CMR) community for consistency, precision and efficiency of CMR analysis. Machine learning has showed great promise in speeding up analysis which reduces the time spent on reporting by clinicians and removes intra and inter observer variability.

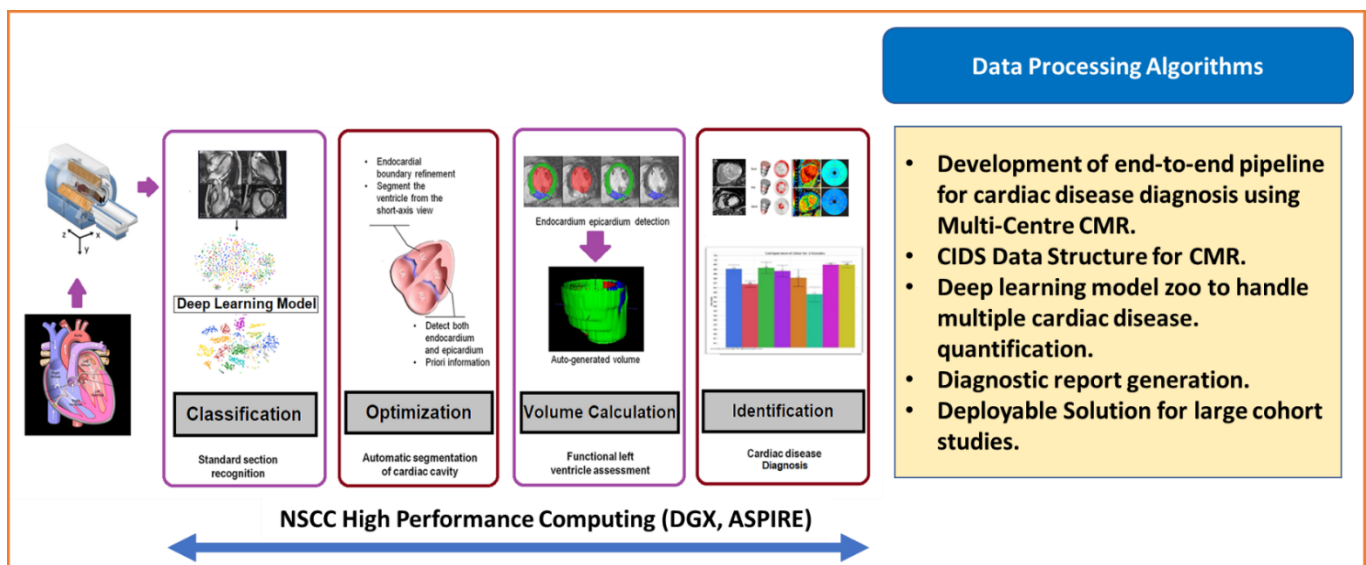
“There was a huge reduction in processing time when handling multi-centre data due to the parallelization of tasks on NSCC’s resources that allowed us to process large complex multi-center cardiac datasets within a days’ time instead of few weeks on a local workstation.”

Bhanu Prakash K.N.

Principal Investigator,
Clinical Data Analysis and Radiomics,
Bioinformatics Institute
A*STAR Singapore



A team of researchers at [A*STAR’s Clinical Data Analysis and Radiomics](#) group are harnessing NSCC’s supercomputing resources to build a complete end-to-end deep learning pipeline for cardiovascular disease stratification for early diagnosis. The team has built a cardiovascular data processing pipeline which can handle large datasets of CMR/Cardiac-CT data from multi-centres. The data files are converted to a standard data structure format called cardiac data structure (CIDS). A model of different deep learning architectures are created which can be used to extract and quantify different cardiac measures like LV – volume, epicardium and endocardium volume and structural changes, ejection fractions and others for early diagnosis of heart disease. Work is in progress to make it into a deployable solution and to extend it for large cohort studies.



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

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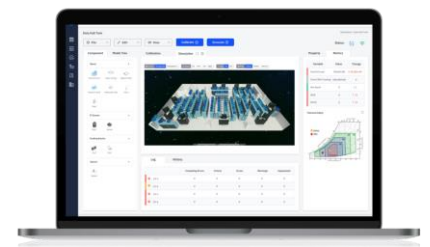
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<SHARED CONTENT>

Shared articles and news from the HPC world.

Energy guzzlers: Data centers and the question of sustainability

Data centers are the ubiquitous “backbone” of the internet, responsible for processing, storing, and communicating all the data that we generate and use when we’re online. One could argue that without data centers, there would be no internet.

The advent of the Covid-19 pandemic saw the already high demand for data center capabilities skyrocket as global internet traffic surged by 40%. With the arrival of 5G networks and growing adoption of cutting-edge tech like cryptocurrencies, AI, and cloud computing, the demand for data centers is set to double by 2025. However, the potential of data centers is only half of a more complicated story – the outsized growth of the industry has come at the expense of the environment. Read more at Tech in Asia [here](#).



Credit: Red Dot Analytics

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Fujitsu plans to provide on-demand access to the world's fastest supercomputer

Japanese tech giant will offer access to advanced computing technologies via the cloud

In an effort to help accelerate digital transformation, Fujitsu has announced its new Fujitsu Computing as a Service (CaaS) offering which will provide global customers with access to some of the world's most advanced computing technologies via the cloud. The Japanese company's new service portfolio encompasses advanced computing resources including its quantum-inspired Digital Annealer technology that is at the heart of the world's fastest supercomputer Fugaku along with software applications that will allow customers to solve problems using AI and machine learning. Read more at Tech Radar [here](#).



Credit: Fujitsu

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How will data centre innovations affect healthcare?

Sustainability and our day-to-day healthcare are becoming increasingly intertwined. Innovations in AI, digital infrastructure, and data security are determining the quality of our healthcare service, so how is it changing?

Healthcare systems worldwide will be expected to deliver diagnostics and care that is both predictive and proactive. Connected care and bioinformatics commentators, including the World Economic Forum annual meeting (2020), forecast that these innovations will be enabled and enhanced by artificial intelligence (AI), machine learning (ML) and data-driven analytics. Read more at Data Centre Magazine [here](#).



Credit: Date Centre Magazine

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Powering Innovation
Supercomputing in Asia

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