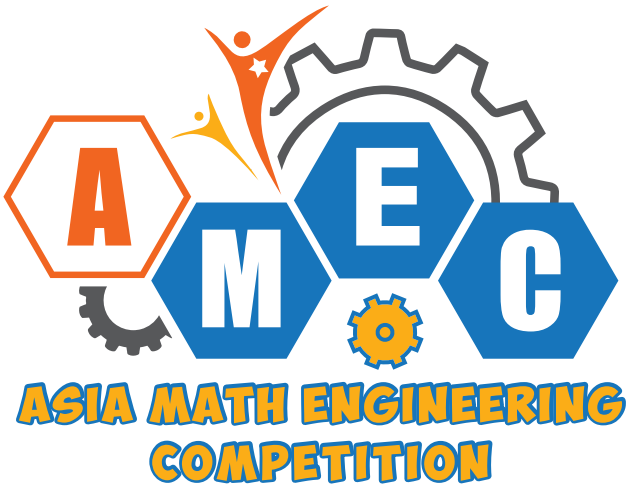
CHANGE MAKERS 02

AMEC

ASIA MATH ENGINEERING COMPETITION

24TH TO 28th JUNE 2015
SINGAPORE



Asia Math and Engineering Competition

24th to 28th June 2015 **In Singapore**

About Youth Ambassadors

Youth Ambassadors (YA) is a non-profit social enterprise dedicated to empower youths in ASEAN countries and beyond to become change makers in their respective communities. We specialise in organizing educational conferences for youths, offering them a platform to learn and be inspired through various activities, workshops and presentations. More importantly, we aim to promote positive interaction and cooperation between youths of different ethnicity with diverse cultures. Some of our flagship programmes include Youth Environmental Summit (YES) and Asian Student Leadership Conference (ASLC).

Youth Ambassadors

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FOREWORD

Alan Yong
Tech Director, NullSpace

Dear young delegates,

Welcome to the inaugural Asia Math and Engineering Challenge 2015, and also our very first international round Innovation, Design and Engineering Championships. I wish all the international delegates a very warm welcome to Singapore, even as we celebrate the 50th year of our nation state.

I first took part in a robotics competition in 1999, when I was 11 years old. It was about a few years after the advent of the LEGO Mindstorms Robotics Invention System. While being an avid LEGO fan, I had never set my hands on this robotics system. To this day I still remember the excitement I had when my teacher selected me to take part in this competition event. I carried this excitement with me till I graduated from high school, and today my friends and I made it our mission to pass on this joy of technological learning.

When I started the IDE Championships in 2011, I had a simple goal of getting students off their textbooks and to learn with their hands. This was how IDE Challenge was started: a mere 11 teams from various schools in Singapore. As the competition grew, we added new age categories and new competitions. This year is the first year that we are running IDE Arduino Robotics, an exciting new competition built upon the popular open sourced Arduino micro-controller platform.

I have personally taken part in countless robotics competitions as a student, and the ones that I remember most are not the days that I walked up onto the podium to receive my trophy, but the ones which I managed to have a breakthrough solution in either the robot design or the programming algorithm. Today many of you have travelled a long way to take part in this event. While not all of you will return with an award in hand, make it a point to depart with something new that you have learnt. Because that is the only thing that you will be able to carry with you in all your future endeavours.

"Education is what people do to you, and learning is what you do to yourself."
- Joi Ito, Director of MIT Media Lab

NULLSPACE
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ROBOTICS – CHANGING OUR LIVES TODAY AND IN THE FUTURE

Featured Themes

Robotics is a branch of technology that involves multi-disciplinary subjects such as engineering, design thinking, artificial intelligence and computer science. Engineers and scientists are constantly pushing the boundaries of robotics by thinking of new ways in which they can help us in our daily life.

Using robots have its advantages of having extreme precision, reproducibility and the ability to function in hostile environment. Here are some examples of how robots have been changing our lives today:

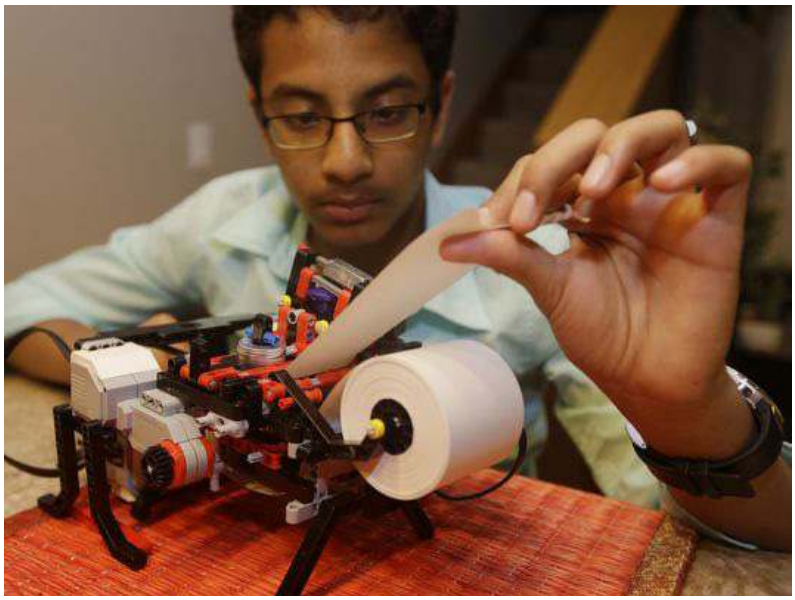
Robotics surgery is a method to perform surgery using very small tools attached to a robotic arm. The surgeon controls the robotic arm with a computer. The precision of the robot allows smaller incisions to be made and increases the recovery time.

Prosthetic robotics arms allow recipients to control the arms with their mind.

Robots help transport medical supplies, laboratory specimens autonomously throughout the medical facilities.

Robot, developed by a group of polytechnic students, teaching and exercising together with a group of elderlies.

Robots have been used in space exploration where the environment is too hostile and out of reach for humans.



Featured Themes

The good news is that robotics technology is accessible to everyone. 12 years-old Shubham Banerjee (left) has built a Braille Printer using Lego Mindstorms EV3 to create positive change in the world. His printer cost around $350, instead of the existing $2000 printers, offering a more cost effective printer for the disadvantaged.

With your understanding of technology, such as the Arduino micro-controller board, and together with your passion to be a change-maker, I am certain that you will be able to develop your own robotics technology to improve our daily lives as well as to benefit the less fortunate around us.

Drones have been used by law enforcement agencies to increase their surveillience and area of coverage.

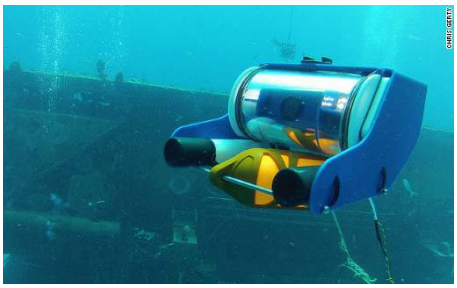
Agricultural robots assist farmers in maintaining and harvesting their crops.

Drones can be used in restaurants for serving of food to customers.

Robots performing dangerous weilding work with precision.

Search and rescue robots have been deployed to search for natural disaster victims as they can explore into hard to reach places.

Bomb disposal robots have been deployed as a first line of response to ensure safety of our army personels.



Underwater robot deployed to survey the ocean and aquatic animals for research purposes.

Guest of Honour

MR. KHOONG HOCK YUN

- Assistant Chief Executive Officer (Development)
- Chief Data Officer, Infocomm Development Authority of Singapore (IDA)

Mr. Khoong is the Assistant Chief Executive (Development) and Chief Data Officer of the Infocomm Development Authority of Singapore (IDA).

Mr. Khoong joined IDA's senior management team in 2000 around the time of its founding. He is responsible for the 'Build' agenda for IDA, to generate economic growth for Singapore. This includes developing and building the infocomm industry, infocomm manpower and critical national infocomm infrastructure, such as the Nationwide Broadband Network (NBN). Mr. Khoong also oversees IDA's strategic and corporate planning, enablement of industry sectors with infocomm, as well as the mandate to develop the Smart Nation Platform (SNP).

Other transformational initiatives led by Mr. Khoong include Wireless@SG, National Authentication Framework, National Cloud Computing Office, Singapore Internet Exchange, an up-coming Data Centre Park and Singapore's first cloud-based infrastructure implementation for the inaugural Youth Olympic Games in 2010.

Mr. Khoong previously served at the Ministry of Defence as Programme Director, developing simulation systems, as well as command, control and communications systems. He brings with him deep industry experience having spent more than 11 years at Mentor Graphics Corporation, where he was Strategic Business Group Director responsible for areas such as R&D, Product Engineering, Consulting Services, and the management of product development organisations in Singapore, Europe and the USA.

A Harvard Business School alumnus, Mr. Khoong has Master Degrees in both Engineering and Business Administration. He enjoys playing golf for leisure.

iDA SINGAPORE

Keynote Speaker

MR. OLIVER TIAN

- President of SIAA & IoT Asia Founding Member
- CEO, Hutcabb Services

Mr. Oliver Tian is the CEO of HutCabb Services and the current President of Singapore Industrial Automation Association (SIAA).

Mr. Oliver is an industry veteran with more than 25 years of IT consulting for Governments and Multinational Enterprises across the Asia Pacific region. He began his consulting journey with Accenture (then Arthur Andersen Associates), and gained regional experiences with more than 100 organiza-tions across the Asian countries over the past two decades. Oliver was the Regional Director for HP Education as well as the General Manager for ERP Services in HP Consulting.

In the mid 1990s, Mr. Tian worked closely with the Center for International Cooperation for Computerization (CICC) as well as Ministry of International Trade and Information (MITI) to formulate strategic programs to aid Singapore's IT Computerization program with assistance from Japan International Cooperation Agency (JICA). In 1991, Mr Tian was awarded JICA's Colombo Scholarship Plan to acquire knowledge on advance technologies from Japan to spearhead National Initiatives in Singapore.

Mr. Oliver is a ex Board Member of Industry Advisory Council of the School of Computing NUS as well as a ex-member of the Alumni Advisory Board to the President of NUS. Mr. Oliver has been an ex officio of the Singapore Computer Society as well as the National Representative to IFIP (International Federation for Information Processing under UNESCO). Due to his dynamic leadership and active involvement in the industry, he is currently serves as President of the Singapore Industrial Automation Association of Singapore and the Immediate Past President of the NUS Computing Alumni.

DR. MARCELO H. ANG JR

- Associate Professor,
  Department of Mechanical Engineering,
  National University of Singapore

Dr. Marcelo H. Ang, Jr. received the B.Sc. degrees (Cum Laude) in Mechanical Engineering and Industrial Management Engineering from the De La Salle University, Manila, Philippines, in 1981; the M.Sc. degree in Mechanical Engineering from the University of Hawaii at Manoa, Honolulu, Hawaii, in 1985; and the M.Sc. and Ph.D. degrees in Electrical Engineering from the University of Rochester, Rochester, New York, in 1986 and 1988, respectively. His work experience includes heading the Technical Training Division of Intel's Assembly and Test Facility in the Philippines, research positions at the East West Center in Hawaii and at the Massachusetts Institute of Technology, and a faculty position as an Assistant Professor of Electrical Engineering at the University of Rochester, New York. In 1989, Dr. Ang joined the Department of Mechanical Engineering of the National University of Singapore, where he is currently an Associate Professor, with a Joint Appointment at the Division of Engineering and Technology Management. He also is the Acting Director of the Advanced Robotics Centre. His research interests span the areas of robotics, mechatronics, and applications of intelligent systems methodologies. He teaches both at the graduate and undergraduate levels in the following areas: robotics; creativity and innovation, applied electronics and instrumentation; advanced computing; product design and realization. He is also active in consulting work in these areas. In addition to academic and research activities, he is actively involved in the Singapore Robotic Games as its founding chairman and the World Robot Olympiad as a member of the Advisory Council.

01 PROGRAM
Day 1

24 June 2015 Wednesday

1500– 1630	**Arrival to Singapore** Transfer to respective accommodation **Check-in**
1630 – 1800	**Ice Breaking Games @ respective accommodation**
1800 – 1900	**Dinner**
1900	**Free & Easy — Orchard Tour (Optional)**

02 PROGRAM
Day 2

25 June 2015 Thursday

0700 – 0800	**Breakfast**
0800 – 0900	**Transfer to NUS PGP Auditorium**
0900 – 1100	**Opening by Nullspace** **Guest-Of-Honour** — Mr Khoong Hock Yun **Keynote Speaker** — Mr Oliver Tian **Keynote Speaker** — Dr Marcelo Ang
1100 – 1200	**Transfer to MDIS (Multi-Purpose Hall)**
1200 – 1300	**Lunch**
1300 – 1800	**Robotics & Programming Workshop by Nullspace** *Teams will receive Arduino Robot Kits. - Introduction to Arduino Microcontroller - Arduino IDE programming interface - Programming constructs - Mission-based training
1800 – 1900	**Transfer to respective accommodation**
1900 – 2000	**Dinner**
2000	**Respective accommodation** - Students will discuss what they have learn in their respective groups

03 PROGRAM
Day 3

26 June 2015 Friday

0700 – 0800	**Breakfast**
0800 – 0900	**Transfer to MDIS (Multi-Purpose Hall)**
0900 – 1400	**Arduino Challenge** • Teams will be given 5 hours of preparation time to program their robot. • Lunch starts from 12pm – 2pm (Own time, own target)
1400 – 1600	**Robotics Competition (Judging)** *Teams will not be allowed to do anymore programming or modifications to their robots.
1600 – 1700	**Prize-Awarding Ceremony & Photo-Taking**
1700 – 1800	**Dinner**
1800 – 2130	**End-of-Competition Celebration**
2130	**Transfer back to respective accommodation**

04 PROGRAM
Day 4

27 June 2015 Saturday

0730 – 0745	**Breakfast**
0830 – 0930	**Transfer to Raffles Place (CBD)**
0930 – 1230	**Marina Bay Waterfront Trail** (Fullerton Hotel Singapore, The Merlion Park, The Esplanade, Arts & Science Museum, The Promontory, Marina Bay Floating Platform)
1230 – 1330	**Lunch @ Marina Barrage**
1330 – 1430	**Marina Barrage & Gallery Tour**
1430 – 1600	**Marina Gardens by the Bay** • Award-winning ecofriendly garden • Dam and fresh-water reservoir
1600 – 1700	**Marina Bay City Gallery**
1700 – 2000	**Free & Easy Shopping @ Marina Square**
2000	**Transfer back to respective accommodation**

05 PROGRAM

Day 5

28 June 2015 Sunday

0700 – 0800	**Breakfast** Checkout from accommodation
0900 - 0945	**Transfer to Marina Bay Sands (MBS)**
0945 – 1200	**ArtScience Museum** (The Deep, Dreamworks Animation &Prudential Singapore Eye,)
1200 - 1230	**Transfer to Charis Mission**
1230 - 1330	**Lunch**
1330	**Transfer to Changi Airport**

Gardens by the Bay

- Masterplan design by firms,
  Grant Associates and Gustafson Porter.
- 3 main sections including,
  Bay South Garden (Opened in 2012)
  Bay East Garden (Partially opened in 2011)
  Bay Central Garden (under construction)
- Attractions @ Bay South Garden
- Conservatories – Flower Dome & Cloud Forest
- Supertrees Grove
- Children's Garden
- Horticultural themed gardens
- Flower Market and main event space (under construction)

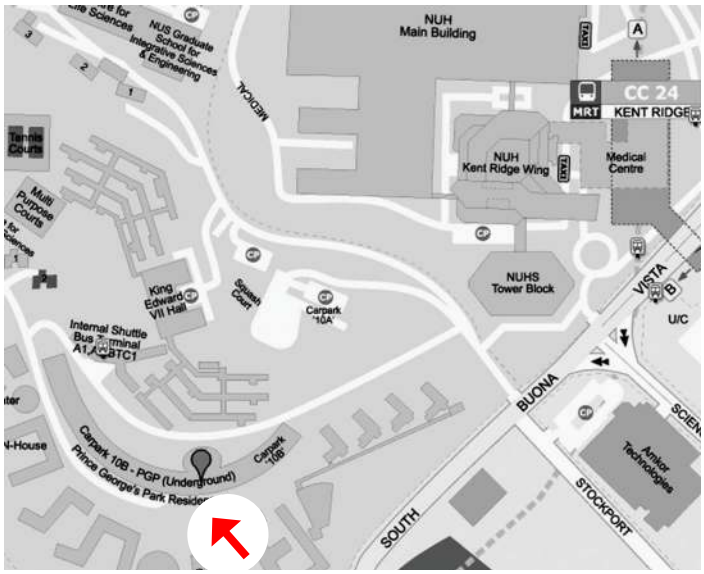
Marina Barrage

- A dam built at the confluence of five rivers for water sustainability in Singapore
- Officially opened on 1st November 2008
- Provides water storage, flood control and recreation
- Downtown freshwater Marina Reservoir - Singapore's 15th reservoir
- International award winning project
- Features include,
  The Marina Bridge
  The Solar Park (green feature)
  The Green Roof
  The Pump House

Arts & Science Museum @ Marina Bay Sands

- Opened in 2011
- World's first ArtScience museum
- Featuring 21 gallery spaces totalling 50,000 square feet
- Sustainability features
  Rainwater is harvested and channelled down the center of the building, flowing through its bowl-shaped roof into a reflecting pond at the lowest level of the building. The rainwater is then recycled for use in the building's restrooms.

CONFERENCE VENUES



National University of Singapore, Prince George Park

Address
Prince George's Park Residence - National University Of Singapore (NUS), 35 Prince George's Park 118429

Mrt: Kent Ridge MRT

Management Development Institute of Singapore (MDIS)

Address
501 Stirling Road, Singapore 148951

Mrt: Queenstown MRT

Asia Math Engineering Competition (AMEC)

Organizer

Youth Ambassadors

Official Travel Partner

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Venue

NUS National University of Singapore

MDIS
founded 1956
Management Development Institute of Singapore
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Accommodations

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Special Thanks

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SiAA
Singapore Industrial Automation Association

NUS | Engineering
National University of Singapore

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FreshCat

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NGEE ANN POLYTECHNIC

Youth Ambassadors Upcoming Events in 2015 & 2016

ASIAN STUDENT LEADERSHIP CONFERENCE

ASIAN STUDENT LEADERSHIP CONFERENCE SINGAPORE (ASLC)

DATE: JUL 22 – 26, 2015

SCIENCE TECHNOLOGY INNOVATION CREATIVITY "K"ONFERENCE

SCIENCE TECHNOLOGY INNOVATION CREATIVITY "K"ONFERENCE (STICK)

DATE: AUG 19 - 23, 2015

ASIAN TOURISM & HOSPITALITY YOUTH SUMMIT

ASIAN TOURISM AND HOSPITALITY YOUTH SUMMIT (ATHYS)

DATE: DEC 9 - 13, 2015

YOUTH ENVIRONMENT SUMMIT (YES)

DATE: JAN 27 – 31, 2016

YOUTH ENVIRONMENT SUMMIT (YES) BALI

DATE: TBA, 2016

ASIAN STUDENT LEADERSHIP CONFERENCE SINGAPORE (ASLC)

DATE: TBA, 2016

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