

## Report on International Olympiad in Informatics (IOI) 2016 at Kazan, Russia from 12-19 August 2016

### Introduction

The IOI is one of five international science Olympiads. The primary goal of the IOI is to stimulate interest in informatics (computing science) and information technology. This year, IOI was organised in Kazan Federal University in Kazan, Russia and attracted 308 exceptionally talented students from 81 different countries. The whole event not only involved the competition itself, but also various excursions, activities and conferences that allowed everyone to appreciate the culture and history of Kazan and also be able to interact with other like-minded individuals and talk about what everyone is passionate about, computer science.

The competition itself stretches across several days. The main contest consists of 2 days and on each day, the participants try to solve 3 tasks within 5 hours. The competition tasks are of algorithmic nature; however, the contestants have to show such basic IT skills as problem analysis, design of algorithms and data structures, programming and testing. The winners of the IOI belong to the best young computer scientists in the world.

Singapore has been participating in IOI since 1992 and since then we have attained a total of 69 medals. This year, we have also selected 4 of the best top programmers in Singapore through the National Olympiad in Informatics and Asia-Pacific Informatics Olympiad to represent Singapore and hopefully get some medals to add to Singapore's medal tally.



A lot of work was done prior to the competition to prepare the students. In Dec 2015, we conducted 2 concurrent training sessions to get more students into NOI. We conducted an introductory class for new students to get familiarised with programming in general and a more advanced class for students who are already familiar to revise some of the basic concepts. After that, we selected a

group of top students and went through an intensive training session with them from January to March that covered most of the topics in the NOI syllabus.



Following that NOI and APIO were conducted and through that we selected our top 4 students to represent Singapore in the prestigious IOI. From June to August, we conducted very intensive training sessions around 4 days a week to raise the standards of the students and gave them practice contests every session to get them used to the time stress of the competition and allow them to hone their contest strategy and time management skills.

### **12 August**

The week began with us moving into to our various accomodations. Unlike previous years, this year the contestants and leaders were housed in the Universiade Village in Kazan while the guests were housed separately in Korston hotel which is a 15 minute drive away. The contestants were treated to a welcome performance showcasing some cultural dances.



### 13 August

This day marked the beginning of the actual competition with the practice round. This round allowed contestants to get used to the computers, keyboard and grading system that they would be using during the competition with problems that were released weeks before the actual competition so they could focus on getting used to the system rather than solving the problems there.



After that, the leaders had a general assembly where the rules of the competition were debated upon. The rules ended up being amended last minute due to a majority vote by the countries and we were thus tasked to explain the change to the participants.



Following that was the opening ceremony held in the concert hall in Kazan Federal University. The ceremony was very grand and included many different cultural performances, opening speeches and an introduction of all the participating countries.



Later in the evening, the contestants and leaders were quarantined and the problems were released to the leaders. There were no disputes and leaders got to work translating the problems into their own native language for their own contestants. As the problems are presented in English, we were fortunate to not have to do any translation and could have an early night.

## **14 August**

Day 1 of the competition began and the contestants started putting their minds into solving the problems. In the meantime, the leaders attended an IOI conference where people from around the world presented their papers on topics related to computer science and computer science education. At the end of the first day, Singapore was doing pretty well with 1 contestant, Jacob Teo, in the gold medal range and the other 3 students in the silver medal range.

Later in the day, there was an excursion to Kazan Kremlin. Kazan Kremlin is the chief historic citadel of [Tatarstan](#), situated in the city of [Kazan](#). It was built at the behest of [Ivan the Terrible](#) on the ruins of the former castle of [Kazan khans](#). It was declared a [World Heritage Site](#) in 2000 and includes many old buildings, the oldest of which is the Annunciation Cathedral (1554-62).



## **15 August**

This day provided a break for the contestants to rest their minds in preparation for the second day. In the morning, there was a "Sports in Kazan" exhibition where everyone got to try out different sports such as cycling and roller-skating. Following that there was a traditional Sabutuy Festival held within the university campus, which includes various sporting events such as sacks racing and egg-in-spoon-in-mouth racing, all of which were available for the contestants to participate in during the festival.



At night, the second round of quarantine and problem discussion began and the problems for the second day of the competition were finalised.

### **16 August**

Day 2 of the competition began and another similar IOI conference was held during the competition for the leaders. At the end when the participants came out of the contest hall, there was a mix of smiles and tears as everyone saw their final results. The Singapore team did the country proud by obtaining a total of 1 Gold, 2 Silver and 1 Bronze medals.



Later that afternoon, the contestants got to visit a Dinosaur Park where they had fun with various attractions at the park while the leaders debated over the final report of the competition.

### 17 August

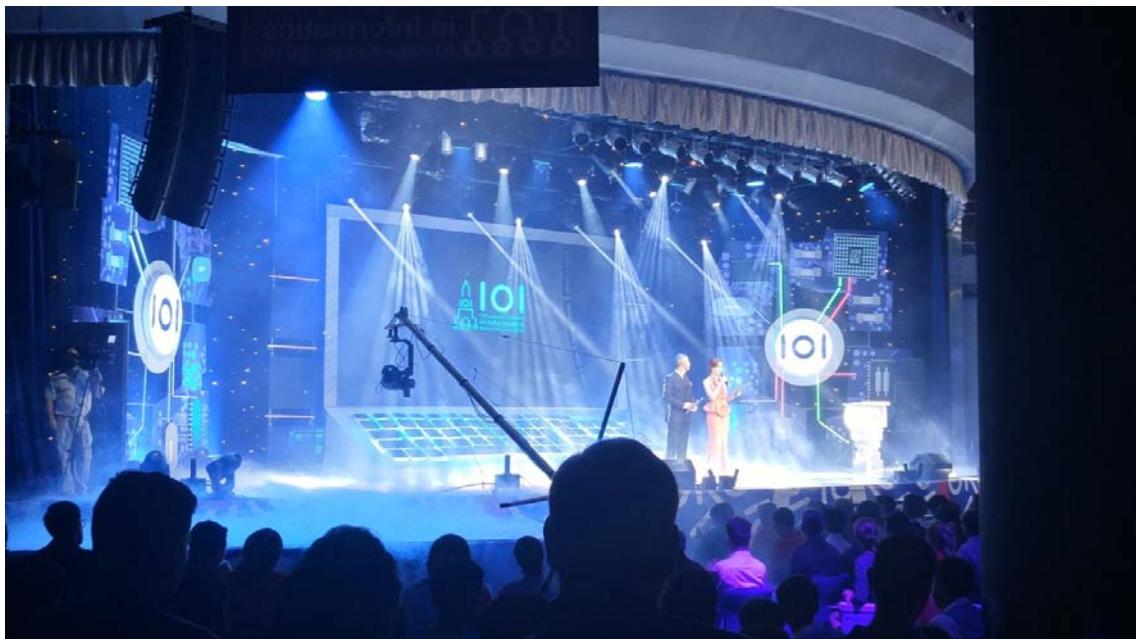
This day was a full excursion day. In the morning, the contestants got a chance to visit Innopolis University. Innopolis is a new Russian city, located in the Republic of Tatarstan and Innopolis University focuses on education in Infocomm Technology and Robotics. There were various stations set up throughout the campus for the contestants to go around and try many different activities. After that, a talk was held inside the university to encourage the contestants to take up degrees related to computer science and to invite them to study in Innopolis.

In the afternoon, the contestants got to visit the island town of Sviyazhsk which is a cultural village. Several stations were set up for the contestants to try out many traditional activities such as archery, axe-throwing and pottery making. This allowed everyone to soak in the rich culture of Kazan that cannot be seen by just visiting the usual tourist attractions in the city area.



**18 August**

On the final full day, the contestants went out to the city to buy some souveniers while the leaders attended the final general assembly which finalised the future of IOI for at least the next year. In the afternoon, closing ceremony was held at the Pyramid Complex which saw the contestants getting their well-deserved medals and also the symbolic handing over of the IOI flag to the host of IOI 2017, Iran.



The final results are as follows:

Jacob Teo Por Loong – Gold  
Clarence Chew Xuan Da – Silver  
Pang Wen Yuen – Silver  
Zhang Guangxuan – Bronze

Congratulation to the Singapore team for their outstanding result!



### Reflection

I feel that going for the trip while following the leaders' path gave me a vastly different experience from just joining as a contestant previously or just through trainings. Through this experience, I got to see and understand the inner workings of the IOI. It isn't just the work of a handful of people, there are many committees and also the general assembly working together to create a fair and challenging competition for everyone while ensuring a fun, cultural and memorable experience that far surpasses just the 2 days of contests.

I also got to meet many important people in the IOI community and it was interesting to find out about how different countries conduct their computer science education and how this affected the computer science standards which are reflected in the students' abilities. Some countries start from as young as pre-school while some do not offer any compulsory computer science education until university. There are also different approaches and languages, where some are more theoretical while some are more practical. It is interesting to consider how some of the methods can be used to apply to computer science education in Singapore to start training more programmers at a younger age.