NUS School of Computing Summer Workshop 2022 (Online)

Century-Old Institution

Founded in **1905**, the National University of Singapore (NUS) is the oldest higher education institution in Singapore.

Top Research University

NUS is consistently ranked as one of the top 20 universities in the world and is **ranked 1st** in the Asia-Pacific region by QS World University Rankings 2021.

A Cultural Melting Pot

As the **6th most international** university* in the world, NUS has a total of 17 faculties and schools, 11 overseas colleges, 30 university-level research institutes and centres, with more than 40,000 students from **over 100 countries**.

*Cited from Times Higher Education The World's Most International Universities 2021

SCHOOL OF COMPUTING

Department of **Computer Science**

Department of **Information Systems & Analytics**

186 Academic & Teaching Staff

222 Research Staff

111 Admin & Technical Staff

4261 Undergraduates

948 Graduate students

598 Masters students, **350** PhD students

SCHOOL RANKINGS

TOP ASIAN UNIVERSITY FOR COMPUTING

QS WORLD UNIVERSITY RANKINGS | Computer Science 2021

1st IN ASIA

4th IN THE WORLD

1 PROGRAMME STRUCTURE

PROGRAMME HIGHLIGHTS

WIDE RANGE

of subjects offered across **5 clusters** with **15 topics** in total to build your knowledge in high-demand IT fields

NUS ACCOUNT

exclusively created for you with access to **NUS learning platforms** such as LumiNUS, Zoom & Microsoft Teams in the course of Summer Workshop

SYNCHRONOUS LEARNING

via **Zoom** with real-time social interaction for discussion, feedback, sharing and insights

PROJECT COMPETITION

at the end of the workshop to showcase your computing skills through **intensive hands-on project** supervised by our esteemed professors - outstanding projects may stand a chance to win attractive prizes including **cash award**

LECTURE RECORDINGS

will be provided to offer **flexibility to review lecture materials** and consolidate knowledge gained in class

CERTIFICATE

greatly advantageous for future career and further studies

BECOME ELIGIBLE

to apply for the **SOC NGNE Programme** which offers a chance for early admission to the **Master of Computing** programme

INTERNSHIP

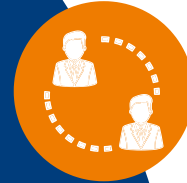opportunities available to participants of the Summer Workshop on a competitive basis

ONLINE COURSE DELIVERY

ACCESS TO VARIOUS PLATFORMS

Students will be provided with an NUS account which can be used to access various learning platforms including **LumiNUS, Zoom and Microsoft Teams**.

SYNCHRONOUS LEARNING

Lectures will be taught via **synchronous video conferencing** using **Zoom** where students can enjoy real-time interaction with professors.

INTERACTIVE TOOLS

Interactive tools such as **Zoom Breakout Rooms, Poll Everywhere, discussion forums, interactive coding, live demo** may be utilised in the courses to maximise student engagement.

PROJECT CONSULTATIONS

Professors and teaching assistants will provide project consultations via **remote screen sharing**. Microsoft Teams may also be used to aid in communication.

LECTURE RECORDINGS

Lecture recordings will be provided to offer flexibility to **review lecture materials** and consolidate knowledge gained in classes.

TIMELINE

1. APPLICATION
1 Mar - 13 Apr

Submit online application before **13 April 2022**. Once you have submitted the application form, an application account will be created for you. Log in using the account details sent to your email address and upload the documents required to complete your application.

2. RECEIVE NOTIFICATION
Mar - Apr

Applicants will be informed of the outcome or subsequent steps required (if application materials / information are incomplete) within 2 weeks after submitting an application.

3. FEE PAYMENT
Mar - Apr

If you are given an offer, you will be required to pay the programme fee **within 1 week from the offer date** to secure a place in the cluster assigned to you.

4. NUS ACCOUNT
End Apr

You will receive your NUS account details around end of April. Please follow the instructions in the email to activate your NUS account and log in to the various platforms to ensure that your account is working fine before the workshop starts.

5. PHASE 1 - BREADTH-TAKING
15 May - 29 May

Attend **real-time introductory lectures** of all the topics in your cluster online via Zoom to have a sense of what you will be getting in each topic. Lectures will be conducted on **15 May, 22 May and 29 May**. Expect some assignments and quizzes at this stage.

6. TOPIC SELECTION
2 Jun

After attending the introductory lectures of the topics belonging to your cluster, you are to submit your topic preference by **2 June 2022**. This will determine the final project topic which you will be going in depth in July. Topic selection results will be announced by **4 June 2022**.

7. PHASE 2 - DEPTH-DIVING
11 Jul - 28 Jul

You are now assigned to a single topic. You will be focusing on this topic - attending **advanced seminars**, forming project group and working on **project development** under the supervision of your topic instructor.

8. FINAL SHOWCASE
28 Jul

This is the big day where you will **demonstrate your project in a virtual showcase** after weeks of intensive construction and refinement. This is a great opportunity to take a look at what your fellow peers have done and learn from each other. The showcase is also a **competition** where a certificate of achievement and **attractive prizes** will be awarded to the winning projects.
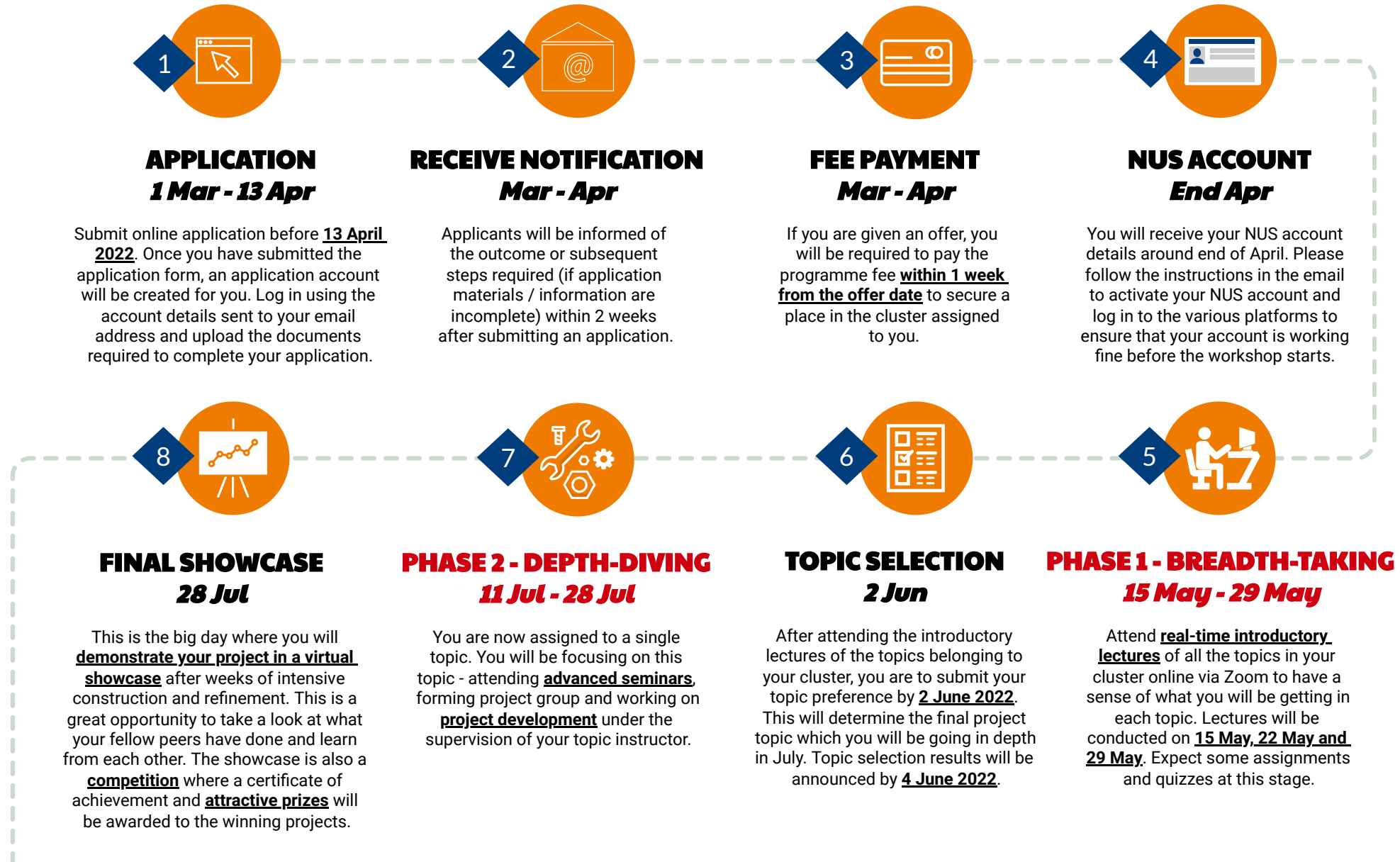
WHAT YOU WILL RECEIVE

Upon successful completion of the workshop, **each participant** will receive:

Completion Certificate

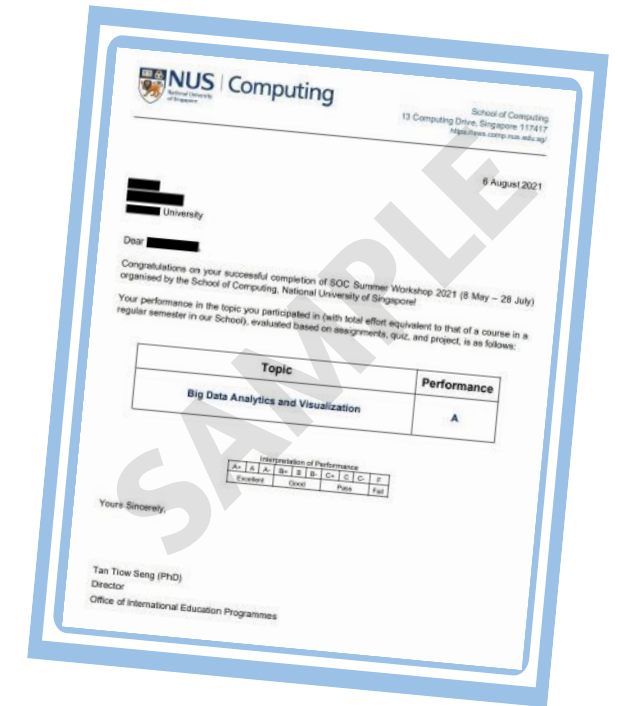To certify that you have completed the NUS SOC Summer Workshop satisfactorily

Performance Slip

To indicate your performance throughout the Summer Workshop in a letter grade

Souvenir T-shirt

An actual T-shirt specially designed for our Summer Workshop participants which will be presented to you as a souvenir

Winning project teams will receive:

Award Certificate

To highlight your project achievement

Attractive Prizes

Winning project teams may be awarded with cash prizes or actual gifts depending on your topic instructor

2 CLUSTERS & TOPICS

CLUSTERS & TOPICS

ALGORITHM, CLOUD & SECURITY	X-CLUSTER	ANALYTICS & IOT	AI & FINTECH	AI & MEDIA
Mining Communities in Big-Data with Algorithms and Computational Thinking		Big Data Analytics & Visualisation	Visual Computing	
DOTA Defense of the Ancients	Data Story App Development with R	AI/ML for Financial Services		Introduction to 2D Game Development
Cloud Computing with Big Data	Making Good Products Great Using UX Design	Artificial Intelligence of Things		Real-Time Graphics Rendering
Solving Real World Problems with Simulation	Web Mining		Embedded System & Deep Learning	Video Streaming with AI

CLUSTERS & TOPICS

ALGORITHM, CLOUD & SECURITY

X-CLUSTER

ANALYTICS & IOT

AI & FINTECH

AI & MEDIA

Mining Communities in Big-Data with Algorithms and Computational Thinking

Big ~~Analytics~~ & ~~IoT~~

Visual Computing

DOTA Defense of the Ancients

Data Story App Development with R

~~Services~~

Introduction to 2D Game Development

Cloud Computing with Big Data

Making Good Products Great Using UX Design

~~of~~ Things

Real-Time Graphics Rendering

Solving Real World Problems with Simulation

Web Mining

Embedded System & Deep Learning

Video Streaming with AI

NEW!

Suitable for:

✔ **Year 1** undergraduates with **Computer Science** related majors

✔ Undergraduates with a **non-computing** major from any year of study

CLUSTER 1: ALGORITHM, CLOUD & SECURITY

Mining Communities in Big-Data with Algorithms and Computational Thinking

LEONG Hon Wai

DOTA Defense of the Ancients

Hugh ANDERSON

Cloud Computing with Big Data

TEO Yong Meng
Dumitrel LOGHIN

Solving Real World Problems with Simulation

Gary TAN

Mining Communities in Big-Data with Algorithms and Computational Thinking

Cluster: Algorithm, Cloud & Security; X-Cluster

This course will teach students how to use algorithms and computational thinking for community detection in large graphs built from big-data, and to use them to gain insights and solve real world problems. Computational thinking is about applying powerful ideas in computer science (problem formulation, abstraction, decomposition, pattern recognition, and algorithm design) to formulate and tackle real world problems.

Students will apply what they learn to a mini-project where they do knowledge discovery from big data in the real world. They work in teams, they choose their own topics, find appropriate datasets from the real world, and they learn to model their datasets using graphs, and then use algorithms to identify communities in these graphs. Then they apply ideas in CT knowledge to analyze the communities identified in the search of new knowledge or insights about the communities. For example, the communities can provide give new insights to how the individual nodes interact, the role of certain nodes in the communities (the driver nodes, the hubs and authorities in the graph), can also help to condense large graphs into communities, and can help in visualization of these large graphs which is helpful in many other big-data analytics tasks.

Click here for more details.

**Professor
LEONG Hon Wai**

DOTA Defense of the Ancients

Cluster: Algorithm, Cloud & Security

No - not DOTA, and not DOTA 2. This workshop is all about computer security. We are building a brave new world, where computer systems intrude everywhere, in your home, at your work, in your pockets. Many systems are based on truly ancient technology. We will look at how to defend our ancient systems, providing practical guidance as to how to make you, your organization, and even your country safer.

DOTA will cover topics such as: attack surfaces for Windows and UNIX based systems, Android, GSM, SCADA/PLCs networking hardware, remote car controllers; injections, cross-site scripting, overflows, classic attacks, cryptography, PKI; defenses: software techniques, design approaches, configurations, IDS.

Click here for more details.

**Professor
Hugh ANDERSON**

Cloud Computing with Big Data

Cluster: Algorithm, Cloud & Security

This is a project-based course to expose students to both the theory and practice of cloud computing. The learning objectives include understanding of key principles of cloud computing concepts, models, technologies and its application for big data. The course is divided into two parts: two 3-hr lecture that introduces basic cloud computing concepts, modules and technologies, and a project to develop web-based big data cloud applications augmented with four 2-hr project related lectures.

I. Topics include: principles of cloud computing – what and why, key business drivers, basic concepts and terminology, technical and non-technical challenges; fundamental concepts and models – cloud characteristics, cloud service (delivery) models, reference architecture, cloud deployment models; technologies behind cloud computing – resource hosting, main components in a datacenter, virtualization, multitenancy; cloud architecture – how to organize (partition) resources, how to operate/manage resources to meet certain objectives, cloud bursting; cloud applications and paradigms – cloud applications, challenges in developing applications, application development models – IaaS (Infrastructure as a Service), PaaS (Platform as a Service) and SaaS (Software as a Service), MapReduce programming model.

II. Cloud-based Big Data Projects - The learning outcome of the team-project is to design a big data application and to develop its implementation on a public cloud. A hackathon-like approach will be adopted to allow students to suggest ideas and form teams based on individual interests and skills. Four 2-hr lectures cover programming PaaS and SaaS IBM cloud services and pattern-based approach to design and implement big data applications. Students learn by examples with hands-on laboratories. For data, students can tap on the rich Singapore Smart Nation Open Government Data repositories among others.

Click here for more details.

**Professor
TEO Yong Meng**

**Professor
Dumitrel
LOGHIN**

Solving Real World Problems with Simulation

**Professor
Gary TAN**

Cluster: Algorithm, Cloud & Security

This course aims to provide students with a working knowledge of modelling and simulation. Simulation is used almost everywhere and in this module, students will learn how to apply simulation techniques to model, simulate and study systems. It covers techniques in simulation model design, input modelling, model execution and model analysis. Students will have hands-on experience using a simulation package to gain a better understanding of how simulation is applied in the real world, e.g. in Digital Twins, Crisis Management and Traffic Simulation.

The objectives of this course are:

- Understand how computer simulation can be used to model complex systems and aid decision making.
- Learn to use simulation software, such as Arena, to run simulation projects from start to finish.
- Learn how to incorporate statistical methods when designing a simulation.
- Learn how to interpret and validate the results obtained from simulations.
- Communicate insights obtained from the simulation analysis to the lay audience.

Click here for more details.

CLUSTER 2: X-CLUSTER

Mining Communities in Big-Data with Algorithms and Computational Thinking

LEONG Hon Wai

Web Mining

LEK Hsiang Hui

Data Story App Development with R

LIU Qizhang

Making Good Products Great Using UX Design

LU Weiquan

Mining Communities in Big-Data with Algorithms and Computational Thinking

Cluster: Algorithm, Cloud & Security; X-Cluster

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Click here for more details.

**Professor
LEONG Hon Wai**

Data Story App Development with R

Cluster: X-Cluster

**Professor
LIU Qizhang**

We are now at the era of big data. Data and algorithms dominate the day. Competitive advantage, for more and more enterprises, is obtained via data analytics and idea sharing in the current fast-paced, data-intensive, and open-source business environment. The capability of understanding data, digging out valuable insights from data, and thus making right managerial decisions accordingly has gradually become an essential skill that business graduates must master in order to excel in their career.

This course prepares students with fundamental knowledge of using R, a powerful complete analytical environment, to organize, visualize, and analyze data. It is, however, not a programming course. It will focus on case studies that will train students how to summarise and present findings in a structured, meaningful, and convincing way. At the end of the course, students should be ready to develop an app to tell data story for a given business case.

Click here for more details.

Making Good Products Great Using UX Design

Cluster: X-Cluster

Good products work well enough, but that's no longer enough to become great. Great products not only work well, but they also employ some magic to make you feel amazing and totally satisfied at the same time. This magic is known as User Experience (UX) design, and in this course, you will learn how to make use of sensations, emotions, and perceptions to make amazing products that not only work well, but also make you feel amazing. At the end of this course, you will have the fundamentals to start walking your own UX design journey, and who knows? With this course, among all the good products in this world, yours may just stand out as one of the greats!

Click here for more details.

Professor
LU Weiquan

Web Mining

Cluster: Analytics & IoT; X-Cluster

With the increased adoption of digital solutions, huge amount of data is generated on the web. While this data is readily available on web pages or found in web applications, most of the emphasis in the data analytics world focus more on the predictive modeling aspects and assumes that the data can be easily downloaded from data repositories such as Kaggle. However, this limits the number of AI applications that can be built.

This course addresses both the manual mining of web content and predictive modeling of the data. Specifically, students will be taught various systematic techniques on how to mine web content, and how to process the data such as applying predictive modeling and building recommender systems.

Click here for more details.

**Professor
LEK Hsiang Hui**

CLUSTER 3: ANALYTICS & IOT

Big Data Analytics & Visualisation

Danny POO

Web Mining

LEK Hsiang Hui

Artificial Intelligence of Things

TAN Wee Kek

AI/ML for Financial Services

Anand BHOJAN

Big Data Analytics and Visualization

Cluster: Analytics & IoT

The "Big Data" phenomenon has come about with the increased production, storage and availability of digital data. Organizations are now grappling with the problem on how to use these data effectively for the benefits of the business. Big Data Analytics is the practice of using digital data for understanding insights from data. To unlock the potential contained within the Big Data requires the application of techniques to explore and convey the key insights. Data is the oil, and data visualization is the engine that facilitates its true value. This course discusses the art and science of data visualization, methods for visualizing data and a methodology for visualizing data for effective and efficient communication of data in business. Participants will be able to create their own stunning and effective visualizations based on real data.

Learning Objectives and Outcomes

1. Understand what big data is and how Big Data Analytics can help organizations achieve a competitive advantage.
2. Appreciate the benefits and insights that Big Data Analytics bring to the organizations.
3. Learn how to use methods and methodology to produce effective and efficient data visualizations.

Click here for more details.

**Professor
Danny POO**

AI/ML for Financial Services

Cluster: Analytics & IoT; AI & FinTech

In this course, students will be introduced to financial services, trading and the importance of AI/ML in the fintech industry with a set of case studies. Students will learn fundamental concepts of AI/ML, including supervised/unsupervised learning, bias-variance tradeoff, principal component analysis and neural networks. The students will get hands-on experience in obtaining financial data via Quandl, or Yahoo Finance and understanding financial data and structure the data in a way that is amenable to ML algorithms. Students will be equipped with skills to implement machine learning algorithms to extract key features from financial datasets. Students will also be trained to develop fintech web applications using modern web application frameworks reactJS, python-flask and basic DB.

Learning Outcomes:

- Understand and appreciate the growing importance of AI/ML in the Financial Industry.
- Understand and distinguish between supervised machine learning (ML), unsupervised ML, deep learning and artificial intelligence.
- Understanding statistical and mathematical models and their limitations.
- Understand Financial datasets and prepare the data for ML using Python libraries.
- Build and apply appropriate AI/ML models and data processing techniques using Python libraries for business decisions in financial settings.
- Use reactJS, python-flask, basic DB operations (CURD) to build fintech web applications.

Click here for more details.

Professor
Anand BHOJAN

Artificial Intelligence of Things

Cluster: Analytics & IoT; AI & FinTech

Artificial Intelligence of Things (AIoT) lies at the intersection of Artificial Intelligence (AI) technologies and Internet of Things (IoT) infrastructure. AIoT aims to achieve smart IoT operations that optimise human-machine interaction, and data management and analytics.

More specifically, IoT is set to disrupt the way we live and work. Smart homes that are filled with connected devices are loaded with endless possibilities to make our lives easier, more convenient, and more comfortable. Industry 4.0, which is powered by Industrial IoT (IIoT), promises to turn smart manufacturing and smart factory into a reality.

IoT devices are expected to generate a huge volume of data. AI techniques such as machine learning and deep learning can help individuals and organisations alike to realise unprecedented business values from these data.

In this workshop, you will learn how to work with single-board microcontrollers and computers in conjunction with various connected devices such as sensors, actuators, smartphones, smartwatches, Bluetooth Low Energy beacons, and other interesting hardware to build various smart home and industry scenarios. You will also learn how to integrate a real-time data pipeline for visualising and analysing the data that are collected by these devices to create a smart AIoT system.

Click here for more details.

**Professor
TAN Wee Kek**

Web Mining

Cluster: Analytics & IoT; X-Cluster

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**Professor
LEK Hsiang Hui**

CLUSTER 4: AI & FINTECH

Embedded System & Deep Learning

Colin TAN
Boyd ANDERSON

Visual Computing

Terence SIM

Artificial Intelligence of Things

TAN Wee Kek

AI/ML for Financial Services

Anand BHOJAN

Visual Computing

Cluster: AI & FinTech; AI & Media

Visual Computing concerns the analysis and synthesis of images and videos. Understanding images is an AI problem, and the field has grown substantially because of the confluence of big data, powerful hardware, and machine learning. Applications are everywhere: face detection in digital cameras, optical character recognition for text translation, diet apps in smartphones, etc.

In this course, you will learn the basics of visual computing, including: image processing & synthesis, object recognition. You will learn through lectures and hands-on sessions, culminating in a final group project.

At the end of the course, you will:
- Understand the basics of visual computing
- Use Python and OpenCV to perform image processing and analysis
- Complete a non-trivial but interesting image analysis project

Click here for more details.

**Professor
Terence SIM**

AI/ML for Financial Services

Cluster: Analytics & IoT; AI & FinTech

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Click here for more details.

**Professor
TAN Wee Kek**

Embedded System and Deep Learning

Cluster: AI & FinTech

This module covers two threads: Embedded system and Deep learning.

Embedded system thread will cover basic hardware / low level software interaction. You will learn how to interface with useful peripherals, e.g. sensors, actuators etc.

In the Deep Learning section you will begin by looking at the fundamentals of statistical models like regression models, Bayesian classifiers, Decision Trees and Support Vector Machines. From there you will explore classical neural network learning algorithms gradient descent and unsupervised methods, before delving into contemporary deep learning methods like Convolutional Neural Networks, Recurrent Neural Networks, Long Short Term Memories, Generative Adversarial Networks and Autoencoders. You will take a hands-on approach and will learn to identify key features of the problem at hand, and choose appropriate deep learning architectures and strategies to solve those problems.

To bridge between the hardware and the deep learning back-end, you will learn about how to efficiently transfer data over Message Queueing Telemetry Transport (MQTT), RESTful APIs, and learn to store and manage that data using both SQL and NoSQL databases. Lastly you will learn to secure your communications by generating and signing cryptographic keys and certificates.

You will apply the ideas learned in an intensive 2-3 person teams to design and build a hardware + software system. The system is freeform and open ended, but should includes hardware interfacing and deep learning. For example, a "home security" system that use movement sensors and deep learning to understand the typical movement of the occupants. Any out of ordinary movements will trigger an alert.

Click here for more details.

Professor Colin TAN

Professor Boyd ANDERSON

CLUSTER 5: AI & MEDIA

Visual Computing

Terence SIM

Introduction to 2D Game Development

Kelvin SUNG

Video Streaming with AI

Roger ZIMMERMANN

Real-Time Graphics Rendering

LOW Kok Lim

Visual Computing

Cluster: AI & FinTech; AI & Media

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Click here for more details.

**Professor
Terence SIM**

Introduction to 2D Game Development

Cluster: AI & Media

Examines the fundamental issues in designing and developing computer video games; creative and artistic elements, story narration, software architecture, interaction model, mathematic, physics, special effects, and in-game AI logic.

Experiences elements in game design: world setting, game play, and interface; and experiences implementing games: conceptualization, prototyping, and play testing.

Learning Objectives

- Critically examine video games
- Understand the structure of games
- Design, prototype, test and implement a game from scratch
- Understand and extend techniques commonly used in games
- Work in groups, present and reflect on extended project

Click here for more details.

Professor
Kelvin SUNG

Real-Time Graphics Rendering

Cluster: AI & Media

Real-time graphics is at the heart of all 3D interactive computer applications, such as 3D games, VR, 3D modelling, and data visualization.

Recent rendering techniques have been heavily exploiting the powerful graphics hardware to achieve unprecedented performance and effects.

In this course, students study the modern real-time rendering pipeline. It introduces modern and traditional real-time rendering techniques, and students learn to write shaders to implement these techniques for the GPU.

The syllabus includes multiple-pass rendering, shading & reflection models, procedural texture-mapping & shading, lights & shadows, non-photorealistic rendering, deferred shading, post-rendering processing, etc.

Click here for more details.

**Professor
Low Kok Lim**

Video Streaming with AI

Cluster: AI & Media

The modern AI revolution (deep learning) has transformed the landscape of many computing domains, including computer networks and systems. Almost everybody is using video streaming apps today (TikTok, Youku, YouTube, Netflix, etc.). In this workshop we will learn all the behind-the-scenes technologies that go into building a scalable and high-quality streaming system, that is optimized with AI techniques.

In this workshop the students will learn the technologies and components of a video streaming system that is built with the modern Dynamic Adaptive Streaming over HTTP (DASH) industry standard. Students will learn both in theory and in a practical, hands-on project about video encoding, video formats and representations, video streaming protocols, and video player optimzations. The workshop will also cover how video streaming systems use AI algorithms to make sure that each user has a great experience (called Quality of Experience, or QoE). The students will build their own AI-driven quality adaptation logic in Python. Student teams will then be able to compare their algorithm against others in a grand challenge competition and see who's AI system comes out on top.

By the end of this workshop, students will:
- Understand how modern video streaming systems work
- Understand the DASH streaming protocol that is used by most providers
- Understand how the quality adaptation logic works
- Build their own AI-driven quality adaptation logic as part of an end-to-end
  streaming system
- Work in teams, present their work and compare how well their AI-logic performs
  against the other teams

Click here for more details.

Professor
Roger ZIMMERMANN

3 APPLICATION

APPLICATION

Apply online via: https://app.comp.nus.edu.sg/app/appln/

Deadline: 13 April 2022

Application may be closed earlier if all vacancies are filled before the deadline.

Contacted within 2 weeks

Applicants will be informed of the outcome or subsequent steps required (if application materials / information are incomplete) within 2 weeks upon submission.

Open to all undergraduates

The AI & Media, AI & FinTech, Analytics & IoT, Algorithm, Cloud & Security clusters are recommended for Year 2 and above undergraduates majoring in Computer Science, Software Engineering, Information Systems and other related disciplines (you may enquire).

The X-Cluster is more suitable for Year 1 Computer Science (or related disciplines) or non-computing undergraduates in any year of study.

Apply early to secure cluster

Some popular topics may be oversubscribed - we advise that you apply early for the best chance at getting your topic of choice.

REQUIRED DOCUMENTS

01 **TRANSCRIPT**

- In English
- Chinese transcripts acceptable for students from a Chinese medium university

02 **ENGLISH QUALIFICATIONS**

- For non-English medium universities
- Either one of the following: CET4, CET6, TOEFL or IELTS

03 **AWARDS/ ACHIEVEMENTS**

- Optional - you can provide certificates of award or achievement that may support your application

PROGRAMME FEE

- There is **no application fee**.

- **Programme fee is only payable after receiving offer letter/email** from the organiser.

- Once you have received an offer email, you may log in to the application system to make payment of SGD1,950 before the deadline stated in you offer email.

- To have assurance that you will have the best chance at getting your preferred cluster, you should make payment as soon as possible upon receiving offer.

Programme Fee:
SGD1,950

Accepted Payment Methods:

CONTACT US

Contact

Official Website

https://sws.comp.nus.edu.sg/

Official Email

sws@comp.nus.edu.sg

Other Useful Links

Summer Workshop Online Application Portal

https://app.comp.nus.edu.sg/app/appln/

NUS SOC NGNE Programme

https://www.comp.nus.edu.sg/~ngne/

NUS SOC Graduate Programme

https://www.comp.nus.edu.sg/programmes/#graduate

4 TESTIMONIAL & PHOTO GALLERY
(From SWS2021)

"The Summer Workshop gives me an opportunity to have a broader view on various research fields in computer science, understand the teaching ways of NUS, and gain a lot of experience of research and teamwork in the process of communicating with professors, TA, and team members.

Even under the threat of the COVID-19 pandemic, and the summer workshop is in an online form, the courses were almost as effective as face-to-face, and we successfully completed our project. As a suggestion, I hope that there could be more research seminars.

It is my honor to participate in the summer workshop this year. Best wishes to all my classmates, professors, TAs and other staff of NUS. I hope I have the chance to study further in NUS in the future."

Summer Workshop 2021 Participant
Huang Tianyi, Sichuan University

"The knowledge of SECURITY in the DOTA topic gave me a more comprehensive and structured understanding of this whole aspect. These old military cryptographic machine and Neko Kanochi (for me the most impressive!!!) are really cool! Many labs are also very interesting! In addition, I have also gained more learning methods and experience in the study of English courses and the cooperation of group members."

Summer Workshop 2021 Participant
Su Haochen, Sichuan University

"As a mandarin-speaking student, I would like to express my sincere gratitude here for your considerations throughout this Summer Workshop. While we are expected or required to speak English in many occasions or venues (even back in my university in mainland China), you at NUS provided us bilingual services -- even include a special Chinese-speaking Zoom introduction session in March before this Workshop just because some of us come from Chinese-speaking regions. At research seminars, those professors also welcome Chinese questions, and some professor said they would "try their best to understand" questions in Chinese. Thank you for respecting us! 谢谢！"

Summer Workshop 2021 Participant
Yang Pei, University of Electronic Science and Technology of China

"The setting of a Zoom help desk is handy, it helped us resume a session that initially didn't appear in LumiNUS, and I appreciate the thoughtful consideration during this special online workshop.

Also, the showcase event from the last day is fantastic! I didn't expect that I would have a chance to see the work of every other group online, and I genuinely had an illusion of wandering across the booths offline! God, do I miss those days before COVID when I indeed had that chance to do so in NUS.

We can see you did massive work throughout this workshop. Thank you, NUS staff!"

Summer Workshop 2021 Participant
Xia Xiaoheng, Shanghai Jiao Tong University

"We learned a lot during this summer study. Due to the COVID-19 epidemic, all learning and communication had to be done online, which posed many challenges. However, due to the patient guidance of our professors and the efforts of our team members, we overcame the difficulties and completed the project very well. Thanks very much.

Summer Workshop 2021 Participant
Liu Zhengyu, Sichuan University

"Prof Terence Sim's topic introduces me to the world of visual computing. And I get some basic ideas about image processing and classification from this topic. I also realize that it is not necessary to use deep learning for all things, instead some simple methods from the origin may be powerful and effective, which the professor mentioned more than once in the lectures.

Summer Workshop 2021 Participant
Zhuang Yufan, Southern University of Science and Technology

"The professors taught well and helped us a lot. I found the discussion session very helpful for digesting the concepts.

Summer Workshop 2021 Participant
Tsai Chengyan, National Tsing Hua University

"Prof. Danny Poo and Dr. Luo Kai gave us a lot of help and some key instructions for our project. Meanwhile, I am a student majoring in Cyber Security, not interested in security issues but skilled in data processing using python. Prof. Danny enabled me to have a look at the data science issues through his classes. I am quite honored to have a chance to take the classes by Prof. Danny about data analysis and visualization since I am always fond of statistics. Our teammates had excellent cooperation, and we have become friends. I am so satisfied with this experience and am applying for Data Science and Machine Learning at NUS, hoping to learn more in the NUS campus in reality.

Summer Workshop 2021 Participant
Li Zhengji, Sichuan University

"Having such an excellent journey with Prof Colin and Uncle Soo is one of the happiest things this year.

Summer Workshop 2021 Participant
Zhang Qixiang, Sichuan University

SWS3009 Embedded System and Deep Learning
Group Photo (15 July 2021)
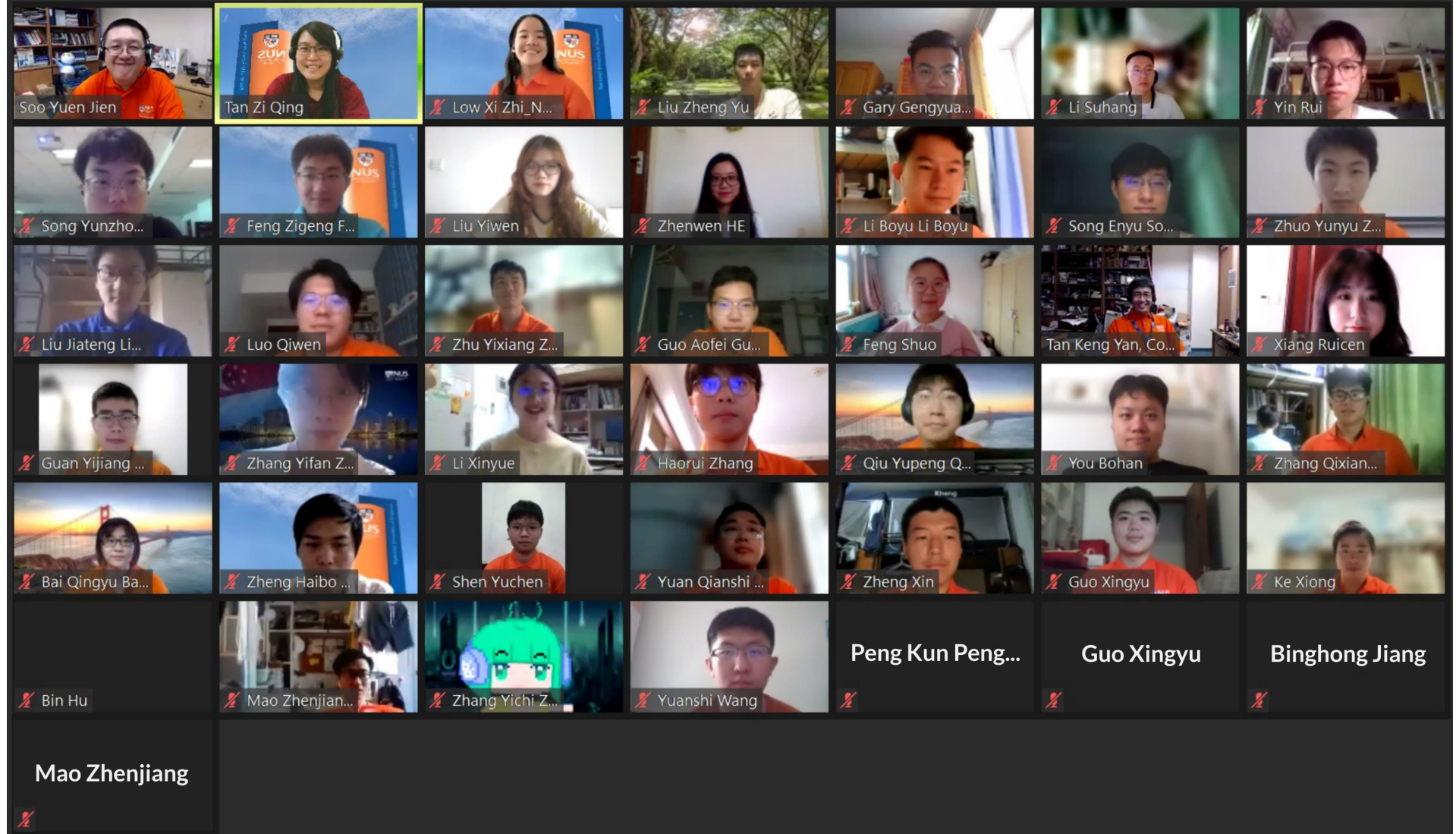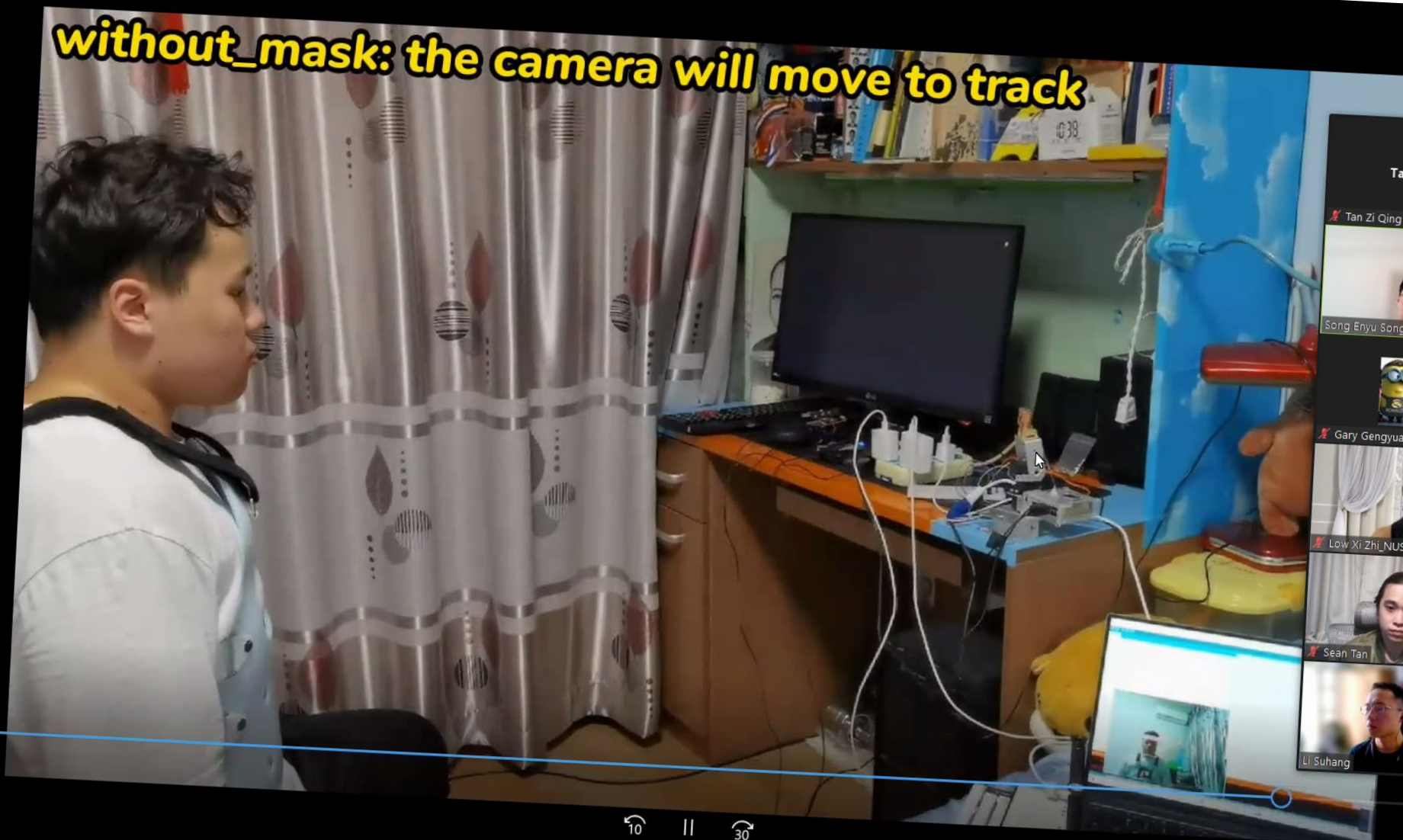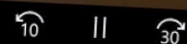
Some of my "fun" Modules
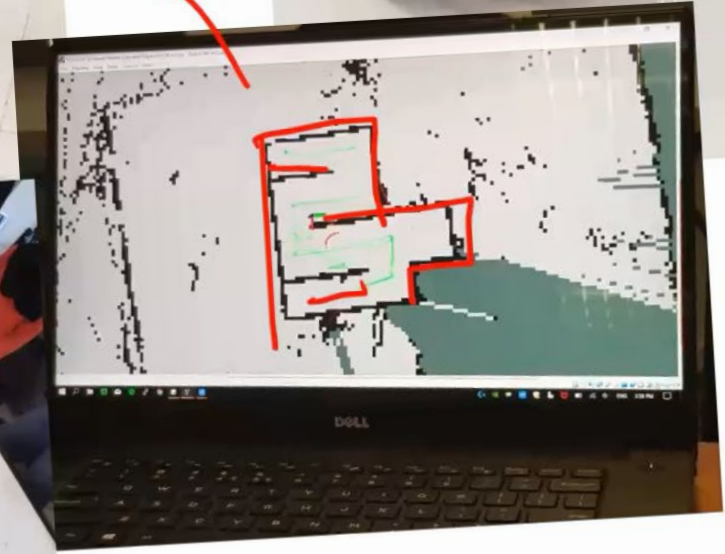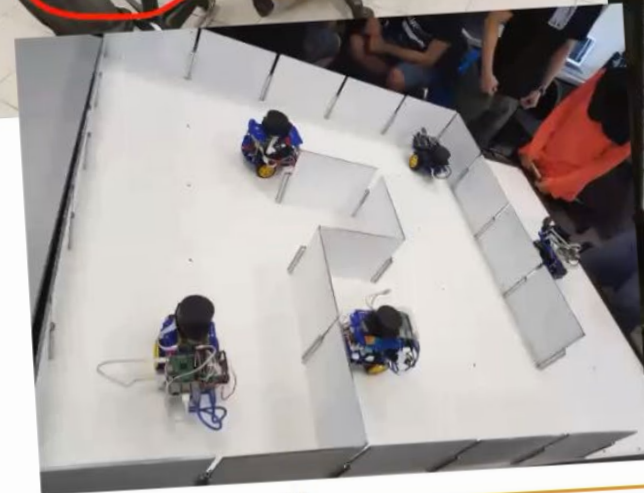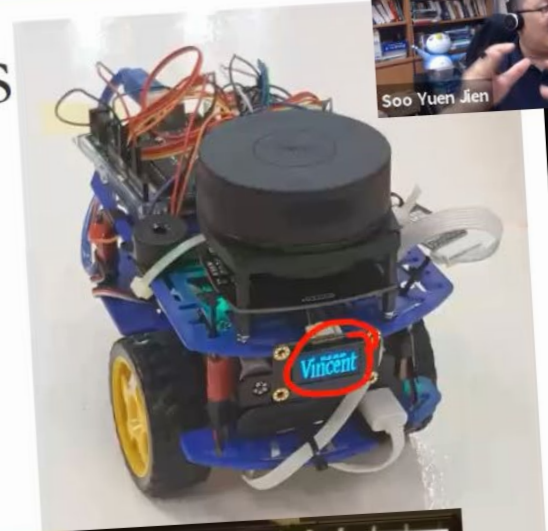
Introduce to 2D Game Development
class photo (14 July 2021)
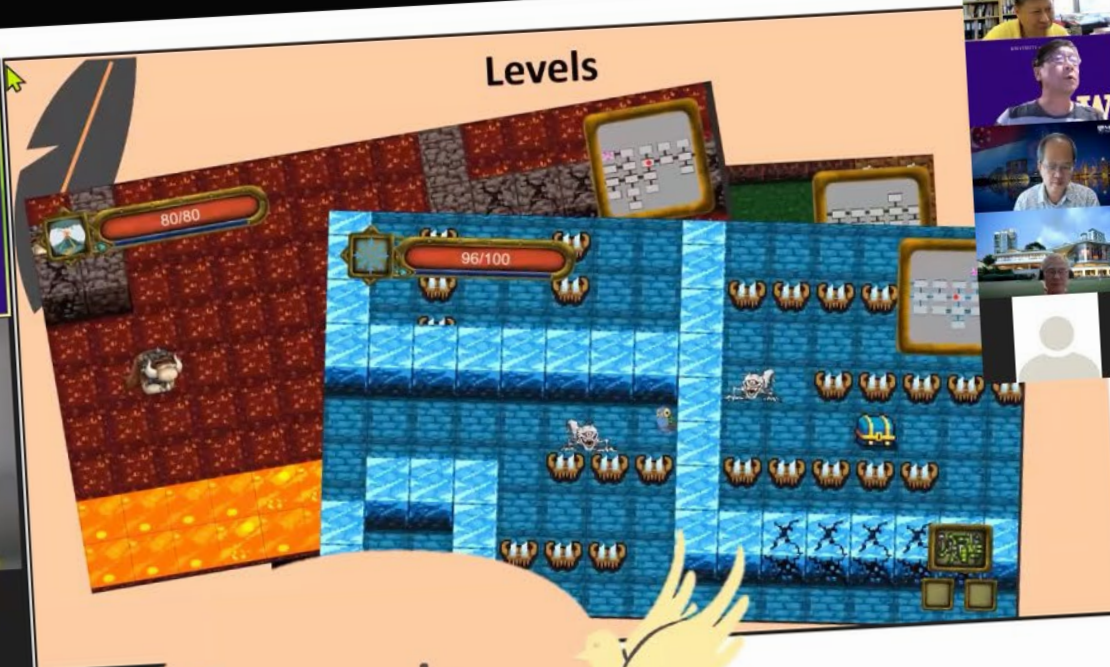
龙秋怡   Long Qiuyi

王子朔   Wang Zishuo

董奕呈   Dong Yicheng

史天宜   Shi Tianyi
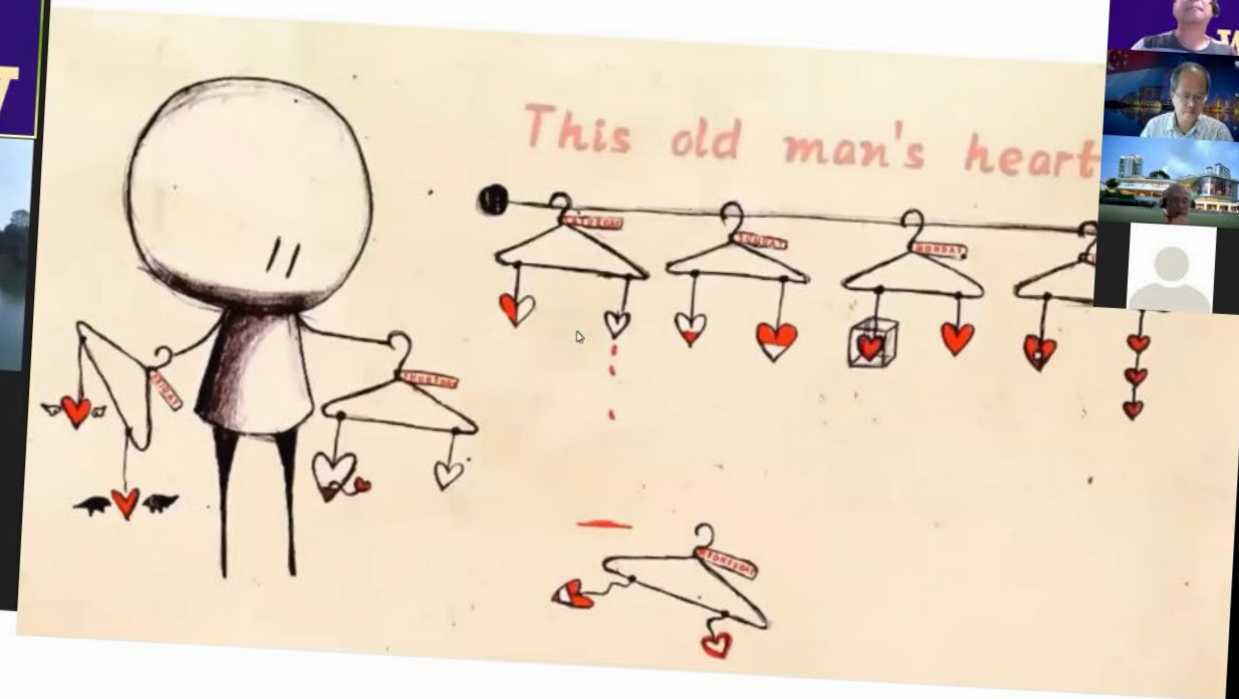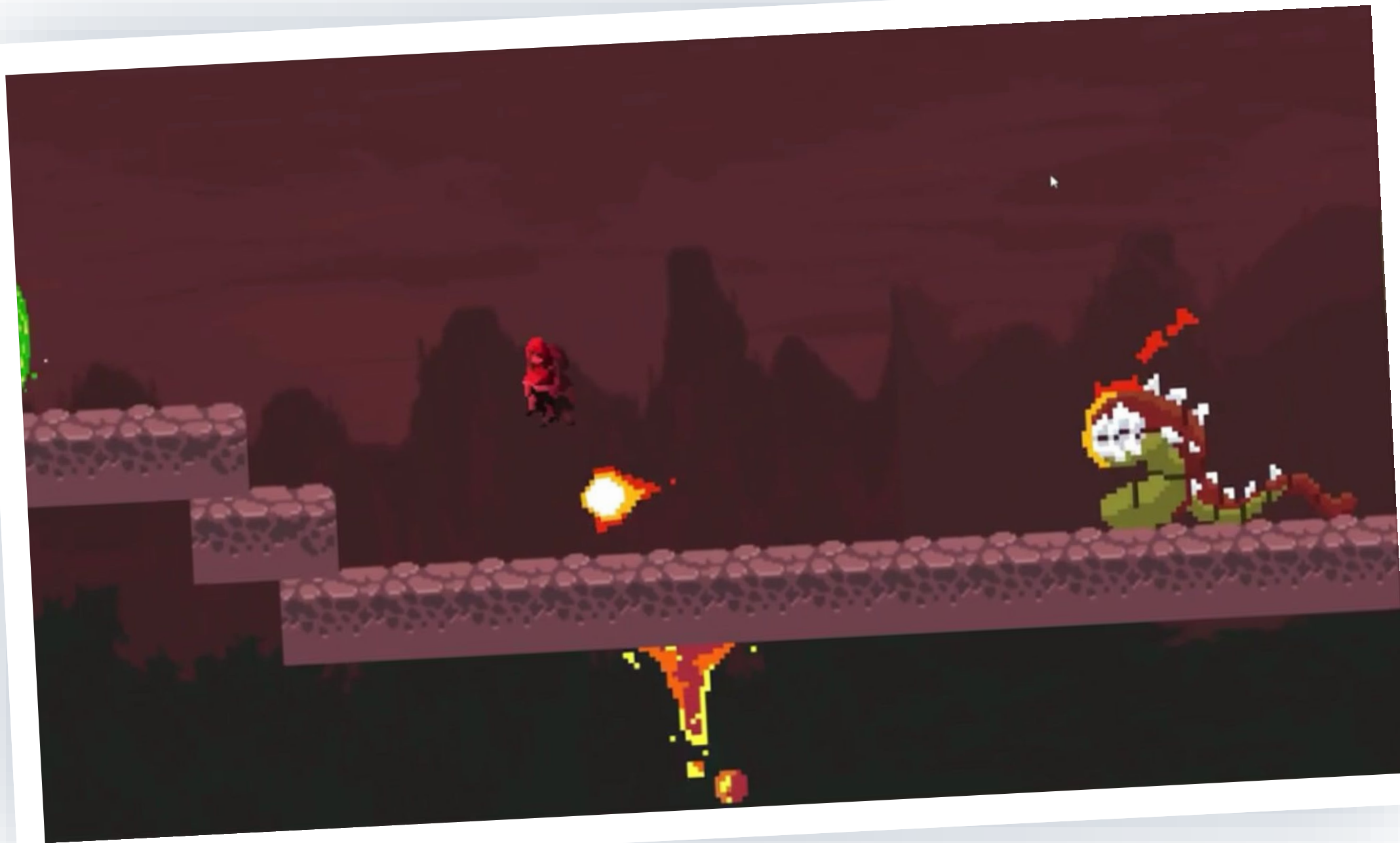
Status
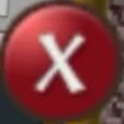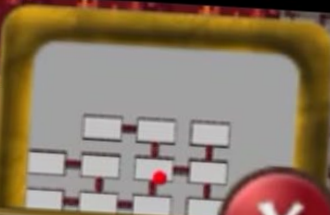
Normal

Acqua

Undead

Flame

Blood

SWS3001 - Mining Communities in Big-Data with Algorithms and Computational Thinking

Fun Shot (21 July 2021)

SWS3025 Artificial Intelligence of Things
Group Photo (16 July 2021)
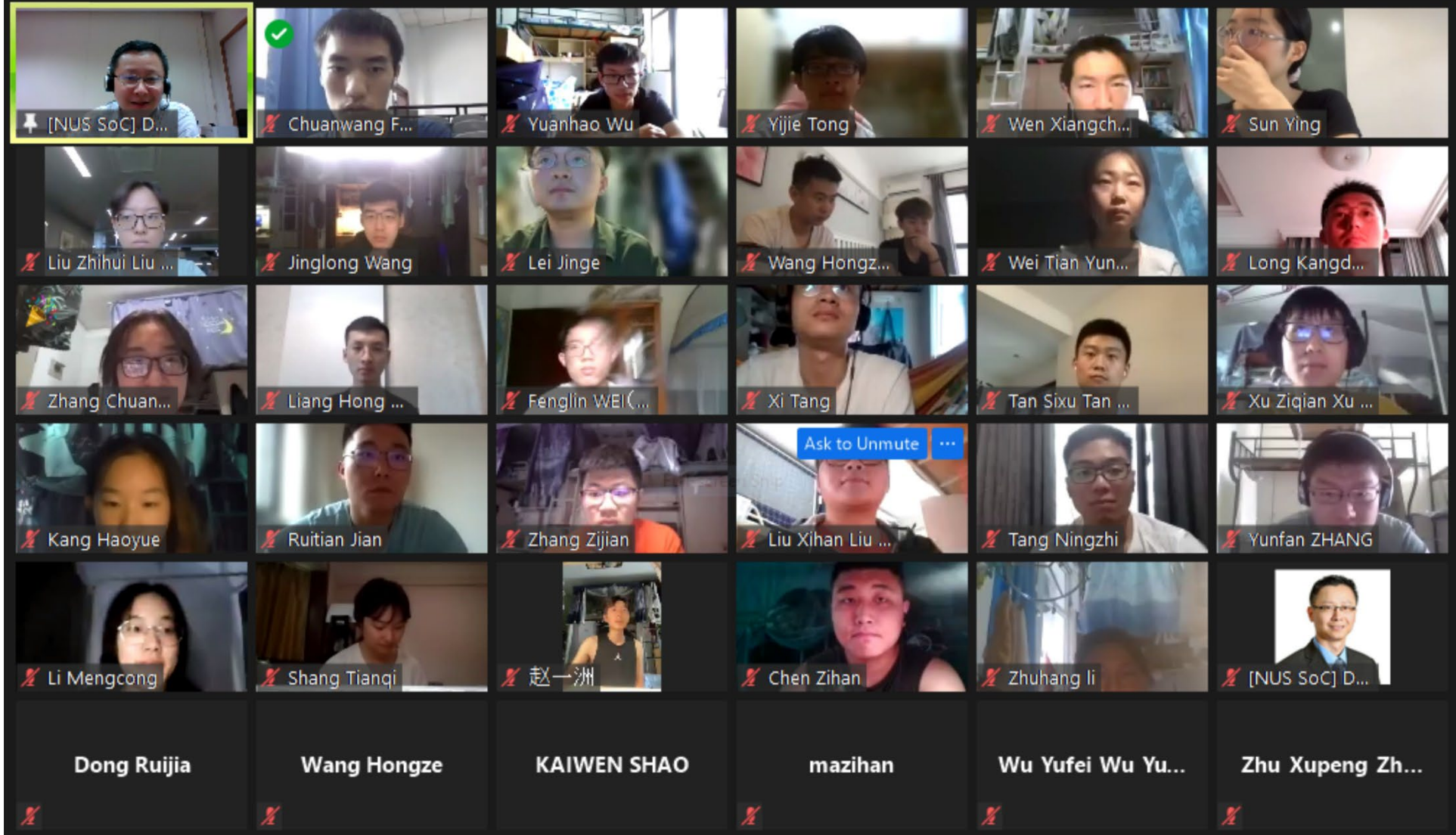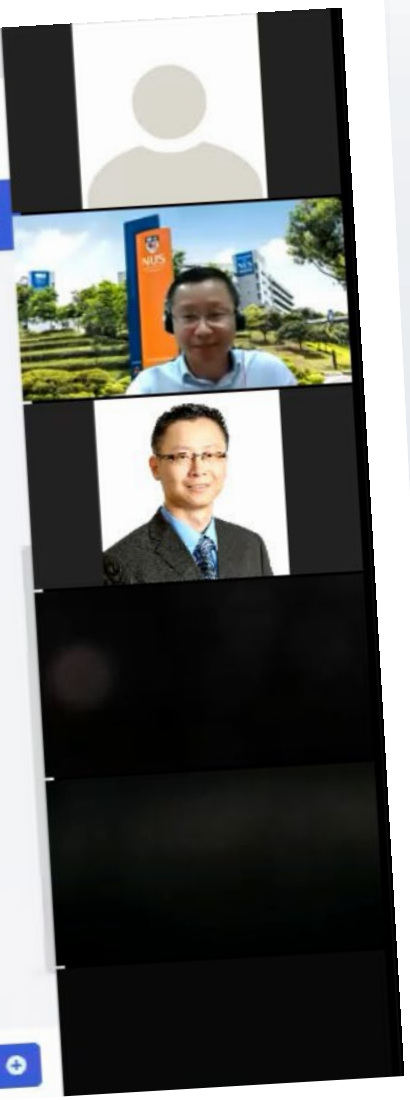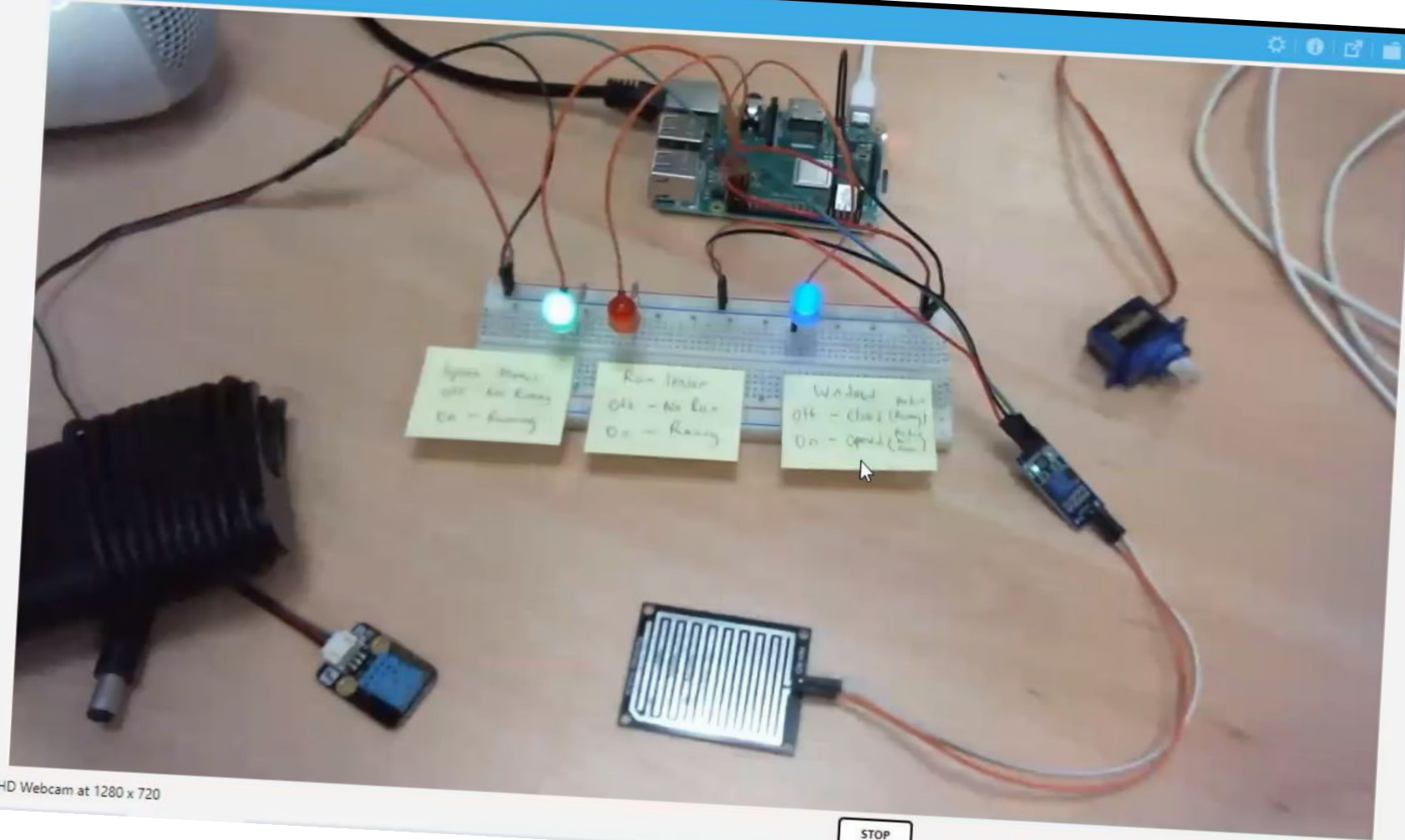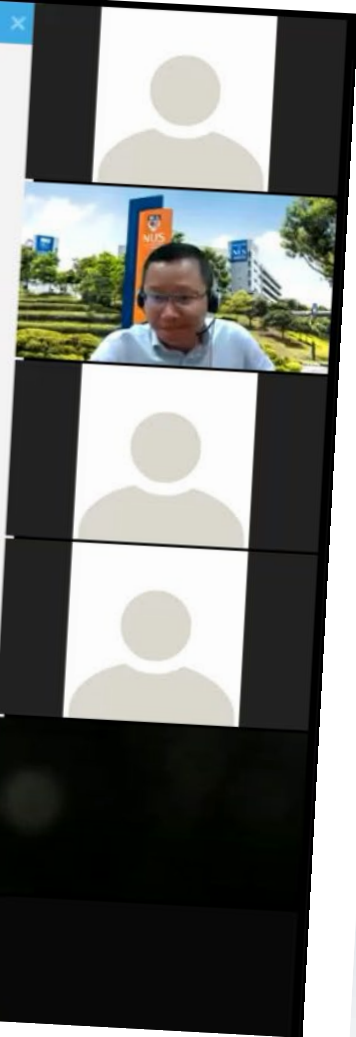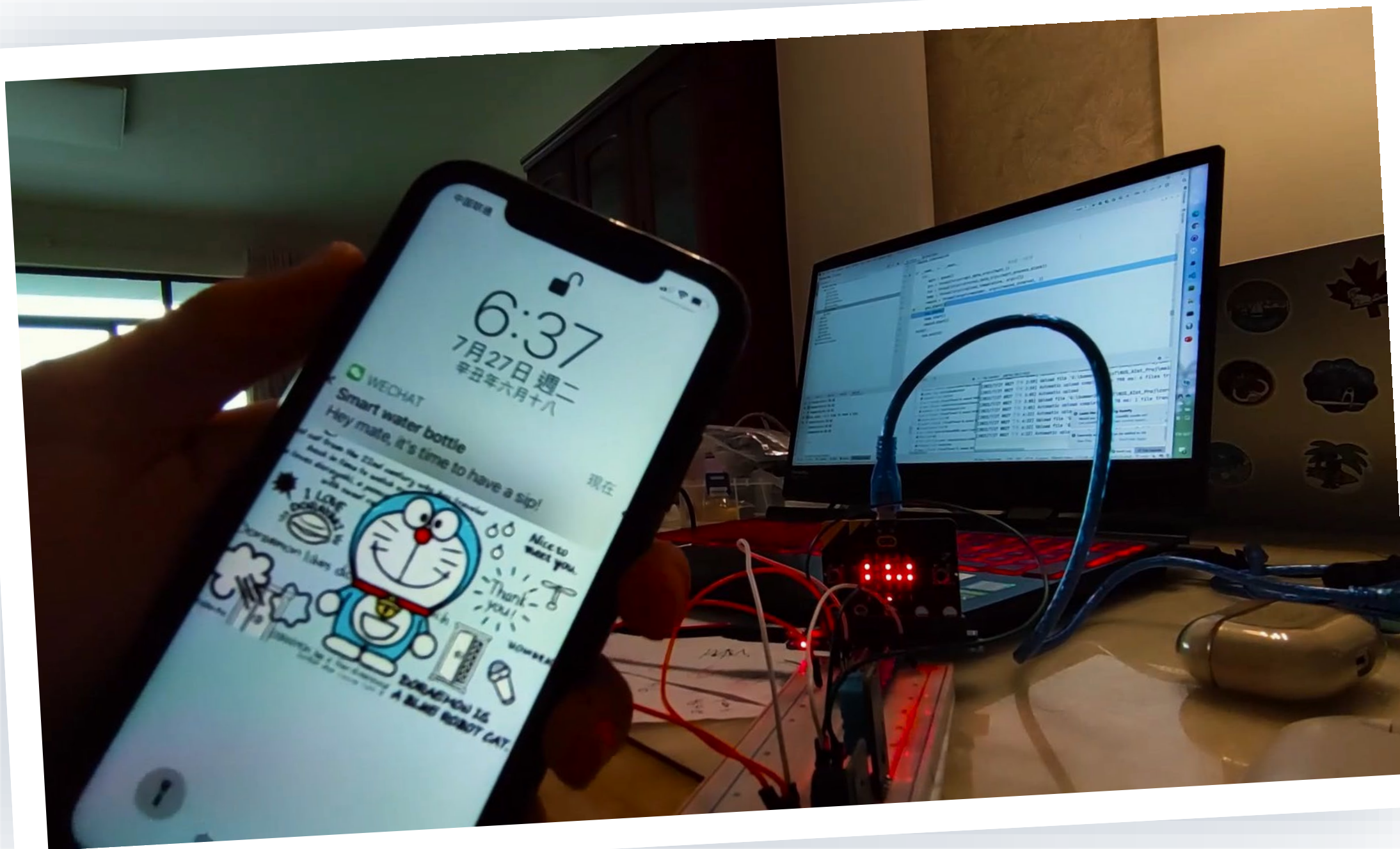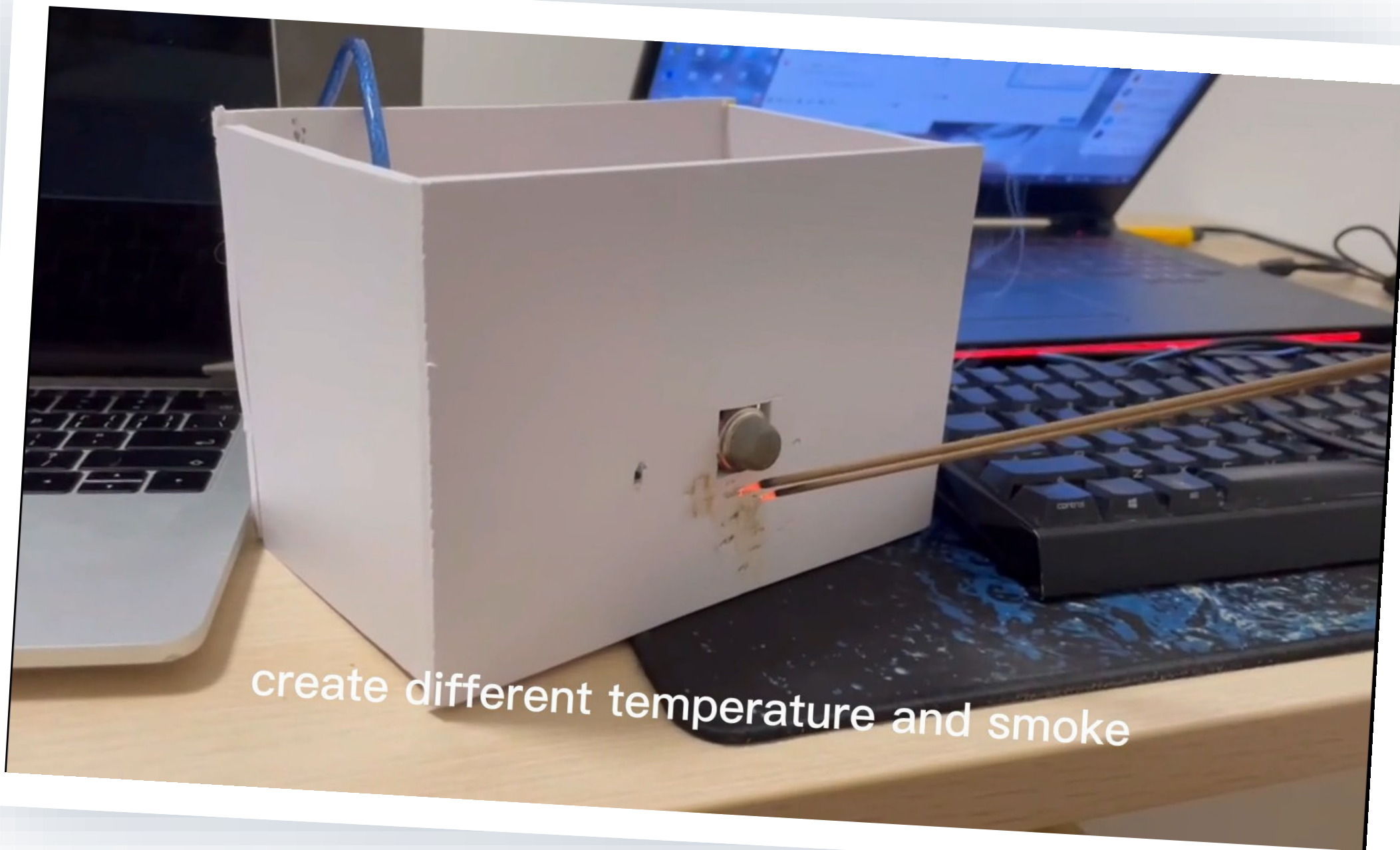
create different temperature and smoke

SWS3005 - Real-Time Graphics Rendering

Fun Shot (24 July 2021)

Shadertoy

Search...

Browse

+   🖥 Image

▶ Shader Inputs

```
1    const float PI = 3.1415926536;
2
3    const vec3 BACKGROUND_COLOR = vec3( 0.3, 0.2, 0.3);
4
5    // Vertical field-of-view angle of camera. In radians.
6    const float FOVY = 50.0 * PI / 180.0;
7
8    // Use this for avoiding the "epsilon problem" or the shadow acne problem.
9    const float DEFAULT_TMIN = 10.0e-4;
10
11   // Use this for tmax for non-shadow ray intersection test.
12   const float DEFAULT_TMAX = 10.0e6;
13
14   // Equivalent to number of recursion levels (0 means ray-casting only).
15   // We are using iterations to replace recursions.
16   const int NUM_ITERATIONS = 2;
17
18   // Constants for the scene objects.
19   const int NUM_LIGHTS = 2;
20   const int NUM_MATERIALS = 4;
21   const int NUM_PLANES = 6;
22   const int NUM_CYLINDERS = 4;
23   const int NUM_SPHERES = 27;
24
25   // Beat Frequnce for the music
26   const float beatFreq = 115.0 / 60.0;
27
28   //Parameters for block
29   float blockNum = 4.0;
30   float blockLength = 0.45;
31
32   // Time for change
33   float MyITime;
34
35   // The Ball to Show
36   int ShowBallNumber;
37
38
39   //=====================================================================
```

▶ Compiled in 32.6 secs

17744 chars

sws3005_A5-ray tracing

13.76   1.7 fps   640 x 360

REC

Views: 93, Tags: raytracing

<> ❤ 6

Created by **sws3005_09** in 2021-07-27

This is the task 2 of assignment 5 of NUS SOC summer workshop 2021.

Comments (0)

Sign in to post a comment.

8.63s

iChannel0   iChannel1   iChannel2   iChannel3

SWS3011 - DOTA Defense of the Ancients
Group Photo (21 July 2021)
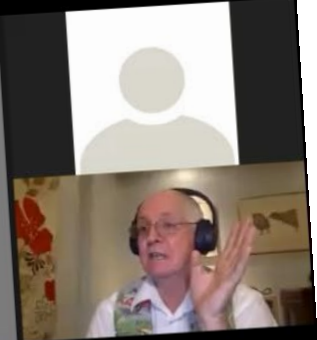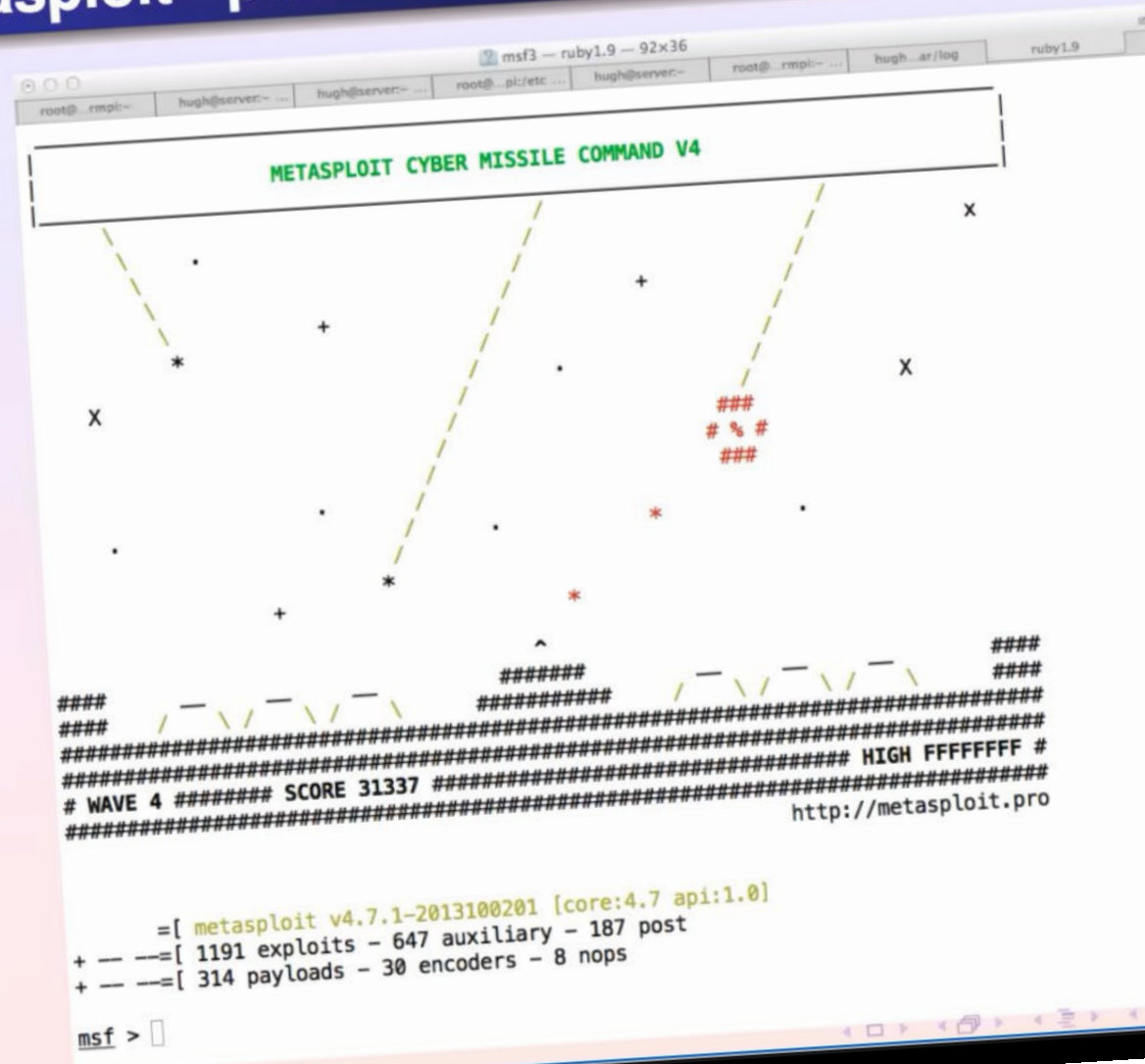
SWS3023 - Web Mining Group Photo (19 July 2021)
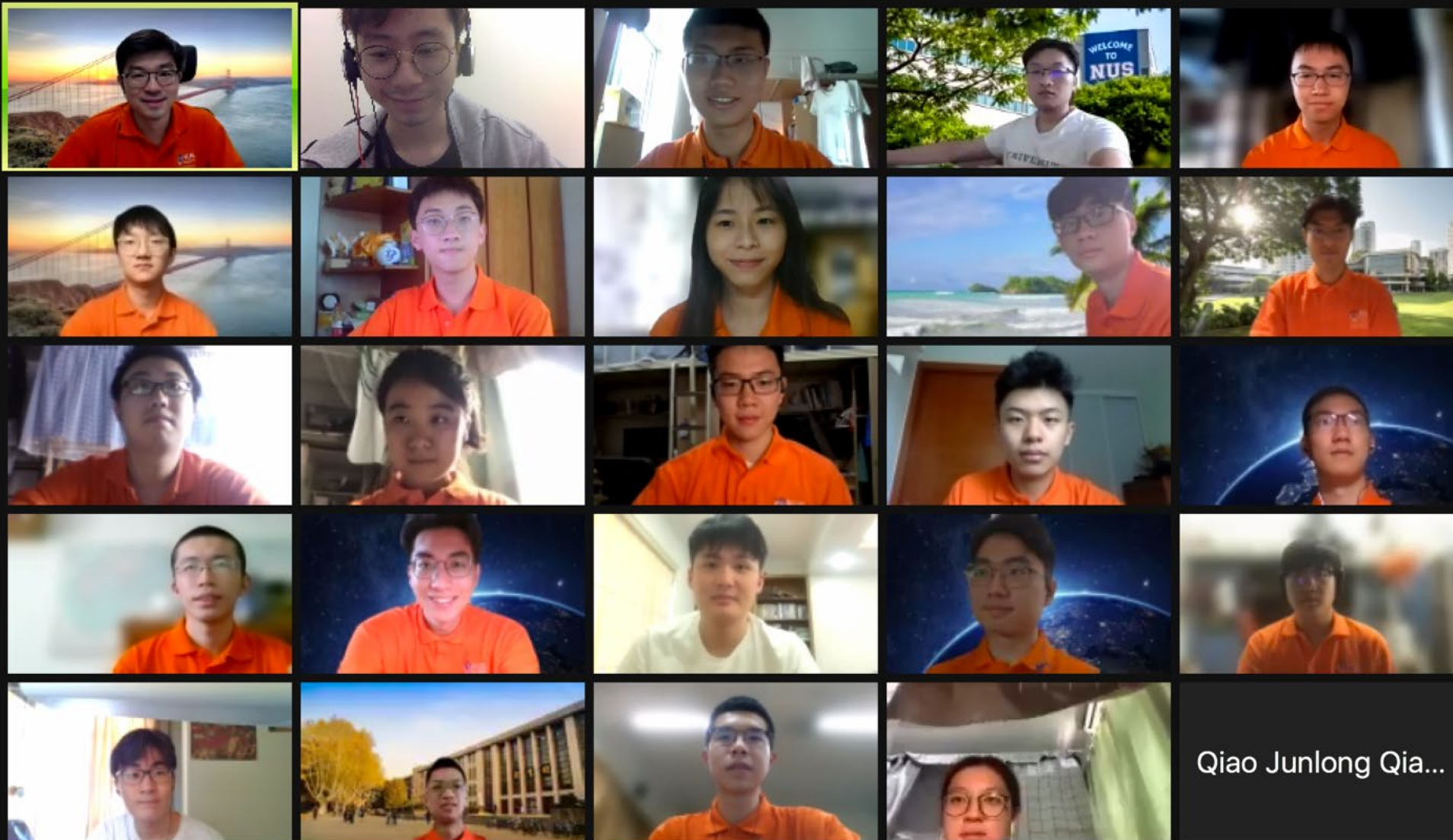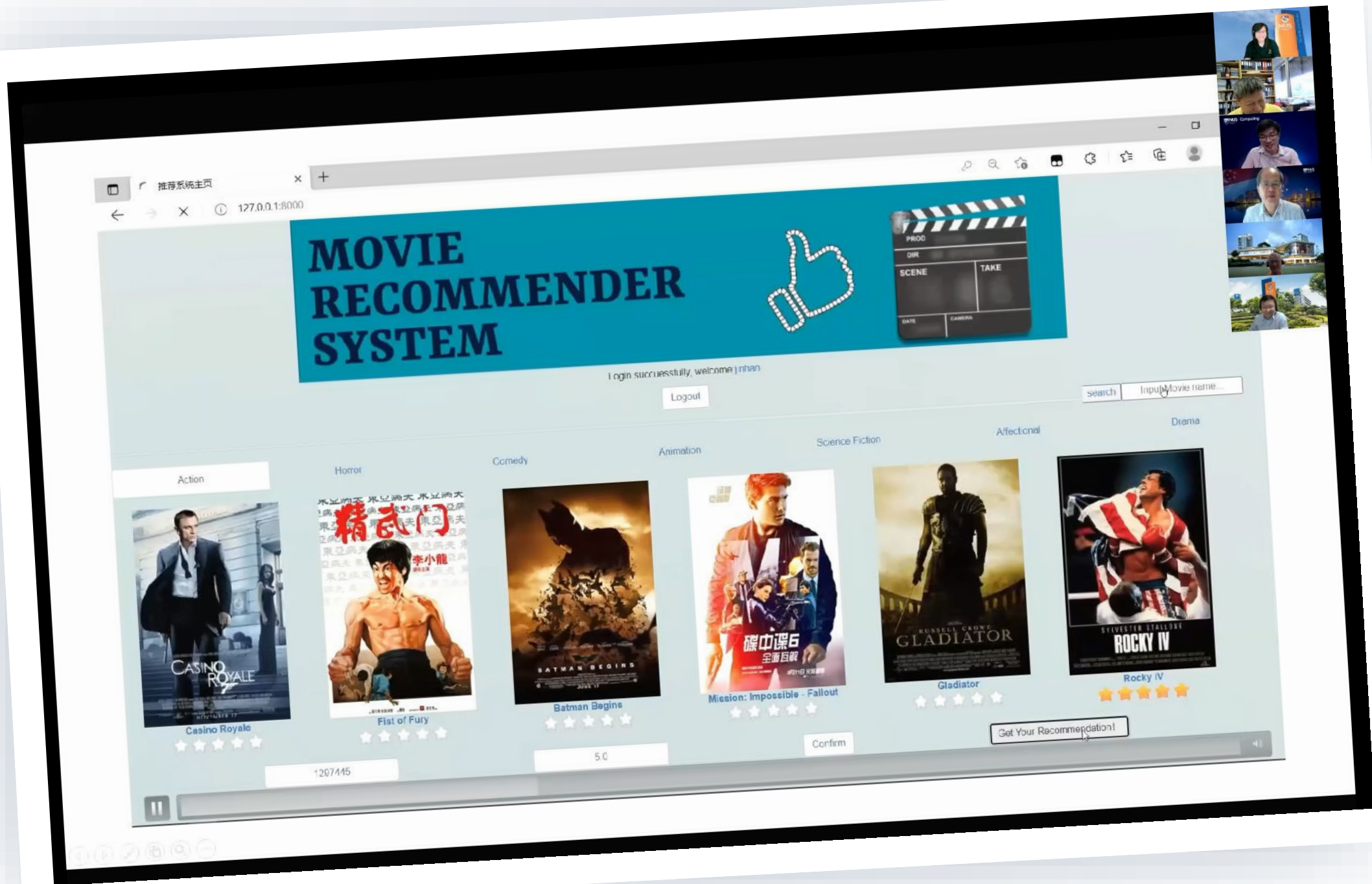
Word Cloud

We collect Twitter users' tweets and visualize how often certain words appear in tweets of Twitter bots and genuine users.

Genuine Users
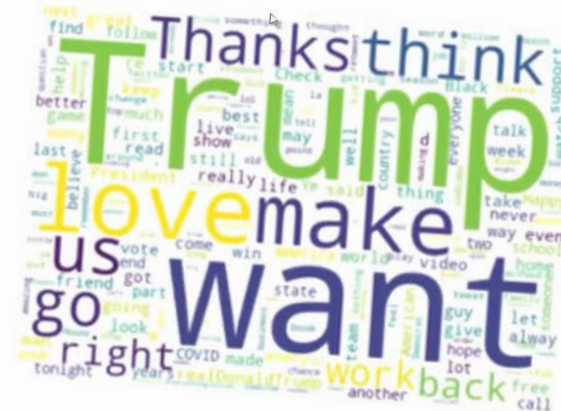
Twitter Bots

SWS3019 - Big Data Analytics and Visualization
Group Photo (13 July 2021)
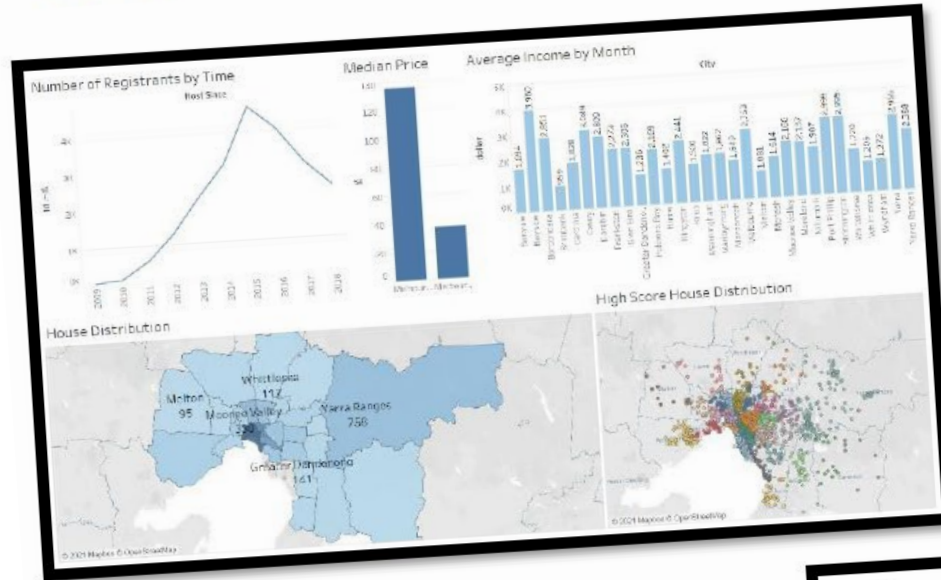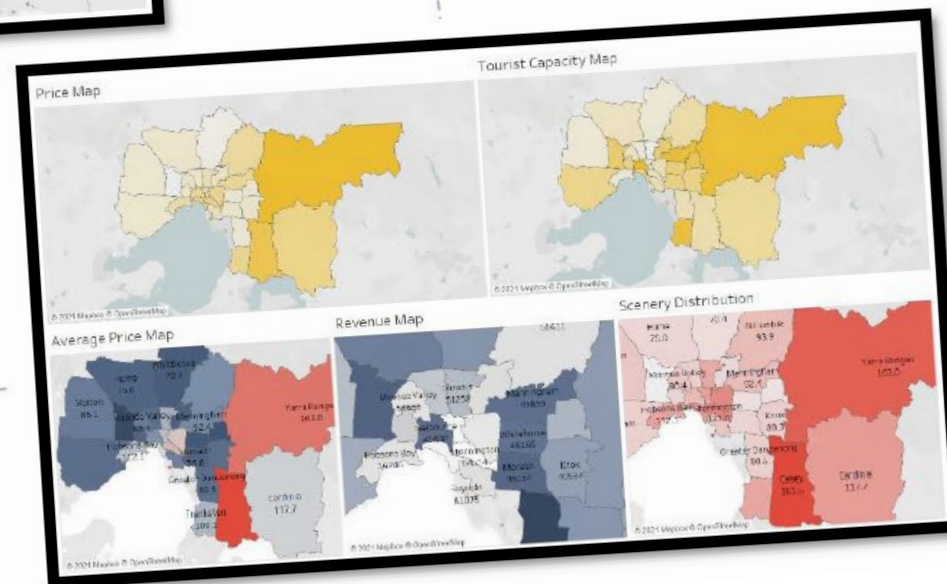
The Most Popular and Potential Time Period of Beijing Housing Market

Trend of Year

Trade Time

2010 2011 2012 2013 2014 2015 2016 2017

Trend of Season

2010 Q1 2011 Q3 2012 Q3 2013 Q1 2014 Q4 2015 Q2 2015 Q3 2015 Q1 2016 Q3 2016 Q4 2017 Q1 2017 Q2 2017 Q3

Quarter of Trade Time

Trend of Month

March 2010 June 2012 March 2013 November 2015 January 2015 June 2016 July 2016 August 2016 March 2017 May 2017

Month of Trade Time

Trend of Week

October 23, 2011 December 30, 2012 November 29, 2015 February 28, 2016 June 26, 2016 July 24, 2016 August 28, 2016 March 5, 2017

Week of Trade Time

In 2010-2017, the housing market in Beijing continues growing.
The most popular and most potential time period was Quarter 4 (October to December) and Quarter 1 (January to March) except 2016.
2016: The most popular and potential time period was Quarter 3.
For most of the months, the last 10 days are the most potential.

Customer Preference for Rooms

	Living Room	Bathroom	Bedroom	Kitchen
	20.39%	16.23%	21.64%	0.01%
	73.16%	83.77%	52.14%	98.65%
	6.45%		26.22%	1.10%

● 0 ● 1 ● 2 ● 3

The most popular combination of room type is
2 Bedrooms, 1 Living Room, 1 Bathroom and 1 Kitchen.

Customer Preference for Floor

26-29 6.87%
1-3 0.24%
4-5 5.73%
20-25 15.51%
6 36.23%
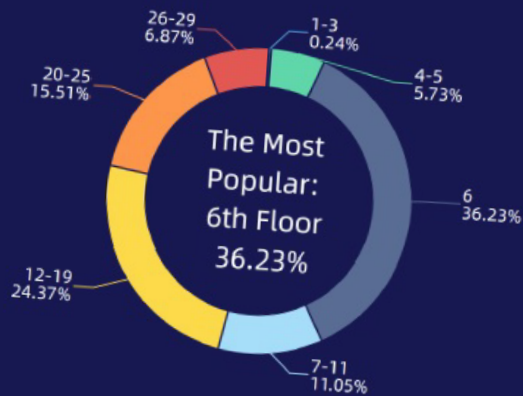
The Most Popular: 6th Floor 36.23%

12-19 24.37%
7-11 11.05%

Customers prefers 6th floor.
In all floors, the 6th floor accounts for 36.23%, which is the highest.

Customer Preference for Buidling Type and Structure

T plate
$mixed

T combination of plate and tower
$steel-concrete composite

$steel

$ brick and concrete

$ brick

T plate
$ steel-concrete composite

T
$ mixed

T

T tower
$ steel-concrete composite

It clearly shows the preference of Building Types and Structures,
the most popular combination is plate-built and mixed structure.

Customer Preference for Infrastructures

59% with subway

57% with elevator

0 10000 20000 30000 40000 50000 60000

without subway
with subway
without elevator
with elevator

● urban ● suburb
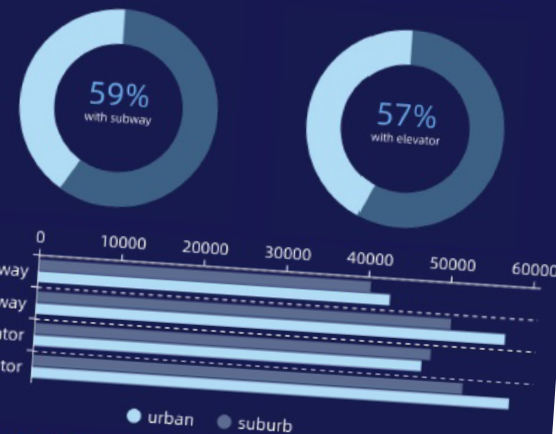
Overall, houses have better infrastructure conditions (subway, elevator, etc...)
are more competitive in the house market, especially in the urban area.

SWS3026 Visual Computing Group Photo (15 July 2021)

Accurate Predictions

Input images (first row) and output labels (second row, represented by corresponding unmasked images) plotted

SWS3022 AI/ML for Financial Services (16 July 2021)

NUS_proj back.py

SWS3022_02_Stock Trading Robot_demo (1).mp4

Project ▾

▾ NUS_proj E:\nus\github_proj\NUS_proj
  > .ipymb_checkpoints
  ▾ static
    > node_modules library root
    > resources
    ▾ src
        app.js
        app_row.js
        data.js
        export.js
        styles.css
        styles_row.css
        validation.js
      logs.log
      package.json
      package-lock.json
      systemjs.config.js
      tsconfig.json
  ▾ templates
      index.html
      test.html
  .gitattributes
  .gitignore
  all_stock.csv
  back.py
  backtest.py
  backtest_RSI.py
  backtest_sma(1).py
  backtest_sma.py
  backtest_turtle.py
  data_demo.json
  fun1.py
  fun2.py
  fun3.py
  learn.html

back.py

```python
import math
import sys
import tushare as ts
# sys.path.append(
import fun1
import numpy as np
import flask
import json
import backtest_sm
import random
import fun2


app = flask.Flask(


global code
global price


@app.route("/")
def index():
    return f
```

back ▾ Git:

OBS 27.0.1 (64-bit, windows) - 配置文件: test1 - 场景: 未命名

文件(F) 编辑(E) 视图(V) 配置文件(P) 场景集合(S) 工具(T) 帮助(H)

未选择源

⚙ 属性 🔲 滤镜

场景   来源   混音器   转场特效   控件
场景 2 📺 显示器捕获   麦克风/Aux   -inf dB   渐变   开始推流
拓展屏   ▬▬▬▬▬▬   时长 200 ms   开始录制
桌面   🔊 ⚙   启动虚拟摄像机
场景 3   桌面音频   0.0 dB   工作室模式
                                   🔊 ⚙   设置
                                                                  退出
(((•))) LIVE: 00:00:00 ● REC: 00:00:00 CPU: 1.2% 30.00 fps

00:00   01:03

⏭ Debug ⓘ Problems ◆ Jupyter ⌐ Git ▦ Terminal 🐍 Python Packages ≡ TODO 🐍 Python Console

Jupyter Server started at http://localhost:8888 // Open in Browser (today 17:21)

1:12 CRLF UTF-8 4 spaces Python 3.8 (base) (2) ⌐ main ① Event Log

THANK YOU!