

VIRTUAL SUMMER SCHOOL

Lighter Aircrafts . Electric Vertical Take-Off and Landing . Future Transport System . Industry 4.0

Where does the future take us?



26 July - 2 August 2021

- ◇ **e-Certificate** upon completion
- ◇ **50% off processing fee** when applying for one of our Master of Science programmes offered at TUM Asia
- ◇ **20% off Summer School fee** for TUM/TUM Asia alumni & students (including the incoming students for our AY21/22 intake)



WHO WE ARE

The Technical University of Munich (TUM) was founded in 1868 and is regularly placed among the best universities in Germany and worldwide. It is the only university to have won recognition as a German 'Excellence University' in every round since 2006. TUM has produced 17 Nobel Prize winners since 1927.

Technical University of Munich (TUM) Asia was set up in 2002 as the first academic venture abroad by a German university, blending German academic excellence with industry relevance in Asia. Its partnerships with top Asian universities and industry leaders combine German engineering with Asian relevance to equip talents for industry and research sectors in the world.



VIRTUAL SUMMER SCHOOL 2021

Experience an engaging and unforgettable time in a one-of-a-kind virtual learning experience during your school break this Summer. The TUM Asia Virtual Summer School 2021 is designed to be an enriching programme for international students from all walks of life, embracing a mix of academic topics alongside insights into Singapore culture.

The Third Revolution of Aerospace

Lighter aircrafts. Electric Vertical Take-Off and Landings. Gone are the times when aerospace progress was a privilege of government-funded multi-billion project monsters - the skies of tomorrow are shaped by start-ups, entrepreneurs with original visions and a brave heart.

The Fourth Industrial Revolution

As we increasingly embrace globalisation and digitalisation, manufacturing processes are becoming revolutionised by Industry 4.0 trends. In this Virtual Summer School, learn more about the evolution of the manufacturing paradigms and the changing roles of customers. We will also provide an overview of the characteristics of a fully networked cyber physical factory learning system. At the same time, get to know about Singapore's unique cultural heritage from a different lens and a little taste of the German language!

Future Transport System

How should the future transport system look like? Introducing a new public transport concept, the Dynamic Autonomous Road Transit (DART), we will share how the concept of a highly integrated public transport system is synchronised with the DART system.

ABOUT



PROGRAMME SCHEDULE (Subject to change)

Monday 26 July - 4 hours 15 minutes	Morning	Welcome to TUM Asia Virtual Summer School! LIVE! - An Immersive Tour of Singapore, the Smart City
	Afternoon	Introduction to the German Language
Tuesday 27 July - 4 hours	Morning	Paradigm Shift to Digitalisation
	Afternoon	Paradigm Shift to Digitalisation
Wednesday 28 July - 4 hours	Morning	Cyber Physical Systems
	Afternoon	Cyber Physical Systems
Thursday 29 July - 4 hours	Morning	Aerospace Engineering - Lightweight Structural Design
	Afternoon	Aerospace Engineering - VTOLs, drones (autonomous vehicles)
		Industry Expert Speaks : Aerospace Engineering
Friday 30 July - 4 hours	Morning	How Should the Transport System of the Future Look Like?
	Afternoon	
Monday 2 August - 2 hours	Morning	Student Presentation



TRANSPORT

HIGHLIGHTS



1

How Should the Transport System of the Future Look Like?

Dr. Andreas Rau
TUMCREATE

The transportation engineering part of the summer school will discuss two topics. In the first part, a new public transport concept, the Dynamic Autonomous Road Transit (DART) system will be introduced. This concept was developed in TUMCREATE, a research entity of TUM in Singapore. The DART system consists of autonomous vehicles which can be electronically coupled creating vehicle platoon. The second part will introduce the concept of a highly integrated public transport system and how to integrate the DART system into it.



VTOLs, Drones (autonomous vehicles)

Prof. Dr.-Ing. Florian Holzapfel
**Technical University of
Munich**



2

In spite of the current health crisis, aerospace research and development have currently embarked on a thrilling journey.

Step changes in many technologies like electric propulsion, power electronics and energy storage, miniaturized high performance sensors, rigged computing resources with unprecedented computational power for safety-critical real time computations and finally tremendous advances in modeling, simulation and system analysis enable what many call the **“Third Revolution of Aerospace”**.

Delivery drones, urban air mobility - utilizing the sky above us in a sustainable and automated manner for the good of all has just come in our reach.

But to make this happen, serious hurdles need to be overcome and challenges need to be met. Over the first century of aviation, almost all aircraft looked alike - fuselage, wing, empennage, engines. Now, a wealth of new configuration enters the stage. What are their dynamic challenges? What are their potentials and shortcomings? Where is the limit?

3



Lightweight Structural Design

Mr Andreas Hermanutz
TUM Asia

Increasing environmental awareness and expected growth in air traffic are driving the need for improved and innovative aircraft designs and technologies. Nowadays, modern composite designs show significant potential in wing development by tailoring the wing to a specific intended behaviour like passive load alleviation or aeroelastic stabilization by using anisotropic stiffness properties of the structural layout. The Summer School presents influences on the design of lightweight structures and discusses the use of typical aerospace materials and their application.



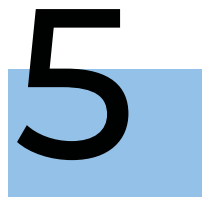
Paradigm Shift to Digitalisation

Dr. Jesmond Hong
TUM Asia

This workshop provides an overview of the four Industrial Revolutions. Students will also understand the evolution of the manufacturing paradigms and the changing roles of customers. The nine pillars of Industry 4.0 will be briefly discussed. Students will also learn about the synergies and contradictions between Lean Management and Industry 4.0.

Cyber Physical Systems

TUM Asia – FESTO Competence Centre for Digitalisation, Technology and Innovation (CDTI)



This workshop provides an overview of the characteristics of a fully networked cyber physical factory learning system. The cyber physical factory will be used to demonstrate the concepts of modularity and flexibility in manufacturing to increased productivity and adaptability of the production configurations to meet the changing needs of the market.

TESTIMONIALS



Rongxuan Ye
China

“Though the classes were not directly related to my university major, I can safely say that they were some of the best classes I have ever attended.”



Vijay R
India

“The classes were so interesting that I did not doze off during any of the sessions.”



REGISTRATION DETAILS



1. Register via the sign-up form: <https://bit.ly/TUMAsia-SS2021>
or scan QR code:



2. Complete your payment by following the instructions in the email that will be sent to you once you have completed your registration form.

3. Successfully enroll in Virtual Summer School 2021 - we are excited to have you join us!



Your registration will be completed and your place in the Virtual Summer School will be reserved when you have made the full payment of the Virtual Summer School Participant Fee of \$550* Singapore Dollars.

*This Fee is applicable to one participant per Fee, and the Fee is only inclusive of the virtual activity costs during the stipulated dates of the Virtual Summer School.

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26 JUL - 2 AUG 2021



TUM Asia

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