ESD Fall Newsletter 2024

WELCOME GREETINGS

Message by **Rakesh Nagi**
Professor, Head of Pillar ESD
and Director of Aviation Studies Institute (ASI), SUTD

Dear ESD Community,

Welcome to a new academic year where we are looking forward with great excitement to the new initiatives under SUTD LEAP, the renewed vision of creativity and impactful innovation. ESD espouses educational strategies to ensure our students' immediate and long-term career success, regardless of the focus area and choice of industries. We encourage our students to build on their academic foundations in course/project work and create novel ways of solving problems for intrapreneurial and entrepreneurial pursuits. Our unique blend of data analytics, optimisation, systems architecture, modelling and simulation, and various specialisation tracks prepare our students for excellence. It is no surprise that our industry partners routinely testify that their best employees come from ESD@SUTD!

Last year was an exceptional year with many eventful happenings. In the newsletter, you will see profiles of our new faculty. They come from the best institutions around the world and are passionate about sharing their expertise with students and colleagues alike.

We also saw some of our faculty move on to other destinations, and we wish them our best. Prof. Peter Jackson retired (for the second time) and is enjoying his golden years in South Carolina, USA.

We launched a new Master of Science in Technology and Design in Data Science (MTD-DS), a world-class programme, that expands our educational offerings to professionally oriented post-graduate students. We welcome alumni and working professionals to upskill themselves in competitive, highly skilled data science and technology careers.

The newsletter has a special focus on Term 4 core subjects and resources for ESD students. Our students lead a vibrant life at ESD. They celebrate their projects' success at different showcases, participate in internships, global exchange and external competitions! We are also proud and inspired by our alumni's successes!

I invite you to read and enjoy the newsletter as we build ESD's journey to new levels of excellence!

MARK THESE DATES

Ask ESD Booth
every Tuesday and Thursday
from 17 Sep 2024 to 18 Oct 2024
11.30am to 2pm
Outside Canteen

**ESD consultation
on GEXP-Minor**
9 Oct 2024
2.30pm to 3.30pm

ESD Welcome Event 2025
Feb 2025

Professor Peter Jackson, former Head of Pillar of ESD (2016-2022) has retired!
We wish Professor Jackson all the best for his future endeavours!

OUR NEW FACULTY

"My research interests lie in machine learning, communication networks, and innovative collection of mobility data. I am an instructor for 10.022 Modelling Uncertainty, 40.319 Statistical Machine Learning, and I am also a mentor for final year Capstone projects. With the support of our dedicated faculty and staff, I am confident that your journey at SUTD will be both fulfilling and enriching. Embrace the challenges, work hard, and enjoy the process!"

Zhao Fang
Senior Lecturer and Deputy Director of The SUTD Technology Entrepreneurship Programme (STEP)
PhD, Massachusetts Institute of Technology (MIT)

"My research interests lie in optimisation, discrete choice modelling, and the application of machine learning in sustainable mobility, active mobility, and maritime studies. I will be an instructor for the course 10.022 Modelling Uncertainty. Together, we will explore the fascinating world of engineering systems and innovative solutions to complex problems. I am confident that your journey here will be rewarding. Let's strive to achieve excellence and make a positive impact on the world."

Cai Yutong
Lecturer
PhD, National University of Singapore (NUS)

"My research interests focus on operations research in revenue management and discrete choice modelling. I teach 10.022 Modelling Uncertainty, 40.002 Optimisation, and 40.014 Engineering Systems Architecture. I'm confident that all of you will excel and thrive at SUTD. With your dedication and the support here, you'll not only do well academically but also grow as innovative thinkers. Keep pushing forward, and you'll achieve great things!"
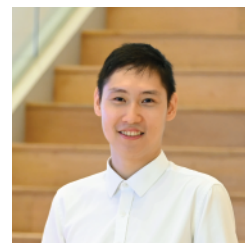
Sun Zeyu
Lecturer
PhD, Singapore University of Technology and Design (SUTD)

"I have more than fifteen years of experience dealing with the study, analysis, and design of dynamical and control systems for a diverse range of engineering applications - from robotic UAVs and manipulators for surgery to cooperative mobility, privacy in cloud-computing, and secure cyber-physical systems. My research revolves around control and information theory and physics-aware optimisation and machine learning for cyber-physical systems safety, security, and privacy."

Carlos Murguia
Associate Professor
PhD, Eindhoven University of Technology (TU/e)

NEW MTD-DS Programme

MASTER OF SCIENCE IN TECHNOLOGY AND DESIGN (MTD)

Be a game-changer in the digital age by mastering the art of integrating technology and design in SUTD's postgraduate programmes.

ELEVATE YOUR POTENTIAL TO THE NEXT LEVEL
A Unique Master's Degree Program That Offers Industry-Focused Specialisations to Meet Your Career Goals.

Data Science Programme
Embark on a transformative journey in the data-driven landscape

SCAN TO READ MORE

"ESD is proud to announce the launch of our new Master of Science in Technology and Design degree programme, with a specialisation in Data Science and Analytics (MTD-DS). Starting in September 2024, we are excited to welcome our inaugural cohort of MTD-DS students, who represent a diverse array of talents and backgrounds from across Asia.

This programme marks an expansion of SUTD's footprint within Singapore's dynamic analytics landscape, and we eagerly anticipate the opportunity to collaborate with our students and industry partners on this transformative journey."

Bikramjit Das
Associate Professor
and Associate Head of Pillar (Graduate Programme)

Undergraduate Term 4 Core Subjects

40.011 Data and Business Analytics

"The course stands out for its emphasis on hands-on experience, requiring all students to engage in a team-based, semester-long project for an external client. By connecting students with industrial clients and exposing them to consulting projects during their second year, the course offers valuable insights into real-world business scenarios.

In the course, students will focus on learning and applying data and business analytics skills to identify opportunities for business improvement and estimate their value to clients. Students also gain proficiency in applying data analysis techniques to practical challenges and develop essential soft skills, such as team coordination, time management, expectation management, and client-facing techniques. These skills play a crucial role in preparing students for their future studies, internships, and long-term careers, laying a strong foundation for their professional success."
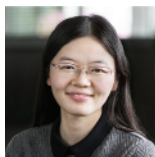
Dr. Ying Xu

40.002 Optimisation

"How can we find the ideal asset allocation to maximise future returns?

What is the most cost-efficient approach to deliver parcels while considering customer availability?

In this class, you will embark on an exciting journey to master the science of optimisation—a powerful toolbox that enables you to discover the best solutions within given constraints.

Whether your interests lie in finance, business operations, or any field involving informed decision-making, this course equips you with essential skills to tackle complex problems head-on.

Get ready to unlock the full potential of optimisation and elevate your decision-making capabilities to new heights!

Prof. Antonios Varvitsiotis

40.017 Probability and Statistics

"In this course, we will answer questions such as:

- Is GPA correlated with salary, and is salary correlated with job or life satisfaction?
- Is it likely that there are 3 students in the incoming ESD batch who share the same birthday?
- To conduct an opinion poll to accurately predict the US election results, how many respondents do you need?
- If vaccinated people can still get sick, then how can we conclusively know whether a vaccine is effective?
- By simply staring at a company's ledger, is it possible to detect accounting fraud?
- Are games of chance, such as lottery or random events in computer games, truly random?
- Is weather prediction for Singapore better than random guessing?

If you find any of the above questions interesting, then ESD is definitely the right pillar for you."

Dr. James Wan

Resources for ESD Students

Explore the ESD Curriculum

Core Subject Videos	Specialisation Tracks	ESD Games

View Facilities

ESD has renovated both the Data Analytics Lab and Systems Design Studio to provide more conducive learning facilities for our students.

The new Data Analytics Lab is now equipped with movable tables and PCs which can be easily reconfigured to meet different classroom teaching needs. The PCs can also be stored away to support talks and seminars.

For the Systems Design Studio, we have removed the wall panels and repainted the room to make it more spacious and brighter for undergraduate students to use this space for project discussions and self-study.

Dialogue Sessions with ESD Head of Pillar

In every pillar term, ESD students are engaged in closed-door dialogue sessions with our Head of Pillar to share their thoughts, and provide feedback about ESD curriculum, course instructors, and administrative support. They can also suggest innovative ideas to enhance their learning journey at ESD. So, do look out for email notifications and don't miss these opportunities!

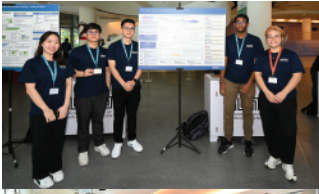**Data Analytics Lab (1.610)**

Systems Design Studio (1.615)

We invite you to use these facilities and let us have your feedback, if any.

40.011 Data and Business Analytics Project Showcase

Our Term 4 students worked on a total of 19 projects, sponsored by 15 distinct companies. In April 2024, we successfully hosted our DBA project showcase at the Campus Centre. The event drew a high turnout, with over 200 attendees, including industry partners, faculty, and current and prospective students.

Feedback from industry partners was overwhelmingly positive and we would like to extend our heartfelt gratitude to the companies for their invaluable support, especially to Infineon Technologies, the Health Promotion Board, International SOS, and Rockwell Collins Aerospace for their outstanding contributions for the past 3 to 5 consecutive years.
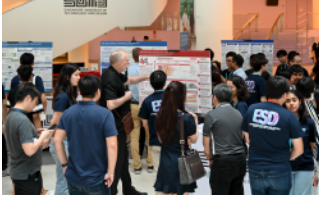
TERM 4

2D Project Showcase

TERM 5

Our Term 5 students were tasked with completing a 2D project that integrates the core concepts from our Manufacturing and Service Operations and Engineering Systems Architecture. We challenged them to design and develop subsystems for an Enterprise Resource Planning (ERP) system and then combine these subsystems into a cohesive whole.

The students delivered both front-end systems, featuring creative, user-friendly, and visually appealing interfaces, and back-end systems, incorporating efficient heuristics, optimisation models, and forecasting algorithms. They applied a formal design thinking process and honed their project management skills throughout the project. A total of 14 teams showcased their posters at the event, and it was thrilling to witness the creativity and innovation on display. Our students did an outstanding job.
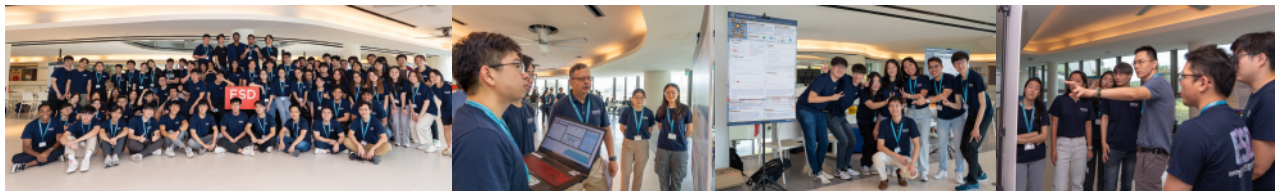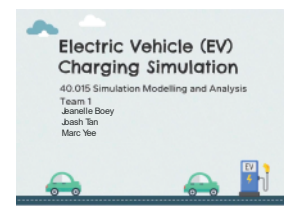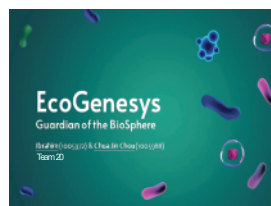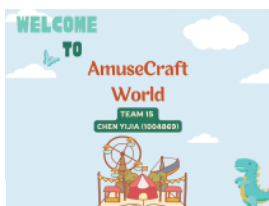

40.015 Simulation Modelling and Analysis Project Showcase

ESD Juniors (Term 6) are challenged to identify and analyse complex engineering systems using simulation models, and critically evaluate competing design alternatives using appropriate statistical techniques.

VIEW PROJECT SHOWCASE

TERM 6

INTERNSHIP

I worked at EV-Electric (EVe) Charging Pte. Ltd. during my Fall internship as a Data Analyst Intern. EVe is a subsidiary of LTA and oversees the deployment of public EV charging stations across Singapore. During my time there, I contributed to several projects that utilised some of the skills I had gained from ESD courses and built strong relationships with my colleagues.

Embarking on internships opens you up to many new opportunities and sometimes involves tasks that may be uncomfortable. Whether you overcome these challenges or not, the new knowledge you gain, whether technical or related to life skills, is what matters most.

Joash Tan
ESD Senior

I recently started an internship at the YMCA of Singapore under the Youth Leadership Development Department, driven by my passion for community service and youth development. I saw this role as a chance to explore these fields further and contribute with my skills.

In this role, I've been tasked with analysing social media data to improve outreach efforts. My background in analytics and coding are able to provide valuable insights to the department. Through this experience, I have learned the importance of building meaningful relationships with youth, a challenge that technology still struggles to address. Fostering genuine connections in a digital age is something I am still actively working on. I have also found a strong interest in strategic planning, particularly in managing youth and volunteers. This internship has been a valuable learning journey, showing me the importance of pursuing opportunities aligned with my interests, even if they don't seem directly related to my academic background. I encourage others to explore similar paths - you may find unexpected ways your skills can make a meaningful impact.

Luo Yingrou
ESD Senior

GLOBAL EXCHANGE PROGRAMMES

Spending a semester at Cardiff University was an unforgettable experience. This exchange program offered a unique opportunity to build lifelong friendships with people from all over the world. Working alongside a diverse group of students was enriching, and provided me with new perspectives and invaluable insights. Another highlight was picnicking at the beautiful parks in the city. There are many green spaces within and around campus to relax in. It's also at a great location to travel to other countries during breaks!

An important consideration you might have heard of before is to think about which modules you can take on exchange to meet your goals. But don't stress if things don't go exactly as planned – I took modules from three different courses and had to work around schedule conflicts with some interesting alternatives. Also prepare for unpredictable rain and weatherproof your belongings! Most importantly, being open to new experiences and people is the best way to learn and have fun on exchange.

Athena Tan
Cardiff University

Hej! My exchange at KTH Royal Institute of Technology was nothing short of remarkable. As one of Europe's leading technical universities, KTH provides a platform to dive deep into your chosen discipline with engaging lectures. From student-led clubs and societies to cultural festivals and outdoor adventures, there's something for everyone at KTH.

For me, moving abroad for the second time changed me as a person. Navigating a new country, adapting to different academic systems, and building relationships with people from diverse backgrounds might be daunting at first, but life's greatest adventures often come from stepping out of your comfort zone. Take the leap and live the academic experience of a lifetime. After all, "Att resa är att leva." ("To travel is to live.")

Tan Jun Onn
KTH Royal Institute of Technology

Going on exchange exposes you to life perspectives that you might not encounter in Singapore. It's a unique opportunity to learn about different cultures and step out of your comfort zone to experience a new way of living. Embrace the diversity and be open to adapting to new environments. I highly recommend traveling to scenic places or engage in activities that are not available in Singapore.

James Teo
National Taiwan University

Raise the Bär: BJB Global Student Innovation Program 2024

ESD senior, Anirudh Bharadwaj, together with CSD seniors, Akash Chandrasekar and Sarang Nirwan participated in the competition Raise the Bär: BJB Global Student Innovation Program from April - June 2024 and won SGD $30,000 as proof-of-concept to bring their project idea to life, with aims of potentially commercialising the solution.

Their solution, powered by machine learning algorithms, assists the fixed income team at Julius Baer to accurately match investment products with less active clients, thereby allowing Relationship Managers to pitch to clients faster, enhancing their productivity and saving hours of manual effort.
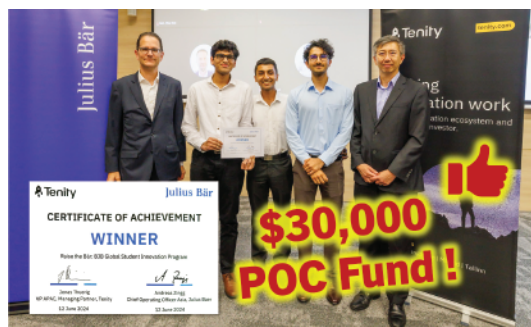
(Left 2nd to 4th) Akash Chandrasekar, Anirudh Bharadwaj, and Sarang Nirwan

(Left 1st to 4th) Jordan Tay, Jetanat Datephanyawat, Nutchanon Suvittawat and Liu Zhihao) (Photo by NSCC)

Manufacturing, Trade, & Connectivity from High Performance Computing AI Innovation Challenge (HPCIC 2023)

Jordan Tay (ESD Masters), Jetanat Datephanyawat (ESD PhD), Nutchanon Suvittawat (ESD PhD), Liu Zhihao (ESD PhD) and Christian Kurniawan (ISTD PhD) won the 2nd runner up award in Student (Senior) category for HPCIC 2023 held by National Supercomputing Centre (NSCC) Singapore.
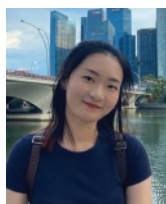
Their project uses artificial intelligence (AI) to identify surface defects on aircraft from images taken by drones. It aims to reduce human errors, minimize inspection time, and eliminate inspection blind spots in the maintenance, repair, and operation (MRO) of aircraft. Their AI model achieved the highest accuracy of 78.6% with YOLOv9 through progressive upgrading.

Student-led Team Bonding Activity 2024

The 2024 ESD Gathering Session brought together students from the Class of 2024, 2025, and 2026, creating a vibrant atmosphere of connection and community. It was an evening filled with mingling, networking, and fun, as attendees enjoyed delicious food and drinks, followed by an engaging trivia game session before dinner. ESD is not just an academic programme, but a strong community where students support and learn from each other. It's the perfect space for building friendships while pursuing our education goals together.

WHAT OUR ALUMNI SAY

"The mind is not a vessel to be filled but a fire to be kindled."

My experience at ESD has been a fascinating journey, witnessing the practical applications of the skills acquired across a diverse range of industries. The hands-on guidance provided by our faculty, along with frequent industry partnership projects, also equips us to step confidently into our careers.

Yu Wenling
Class of 2021
Snr Executive
DB Schenker

Zihan Sun
Class of 2019
Asst. Manager
PSA

ESD designed a very good curriculum for students with rigorous academic courses and projects to have hands on practices. It's a good place for students to learn practical skills, explore their interest and make industry connections. Know your goal, make good use of your time here and you will have a good preparation for your professional career.

SCAN TO READ ALUMNI TESTIMONALS

2022 ESD GRADUATE EMPLOYMENT STATISTICS

Source: https://sutd.edu.sg/Admissions/Undergraduate/Graduate-Employment-Results/2022

89.5 %
Overall Employment Rate

S$5,046
Average Gross Monthly Salary