

CUSE Newsletter

A semiannual newsletter of Regional Centre for Manufacturing Systems Engineering, Chulalongkorn University (Chula Systems Engineering - CUSE)

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A note from CUSE Director

Dear CUSE community,

Time flies! Together, we have managed to brave a year full of new challenges. Together, we have witnessed a once-in-a-century global pandemic that has changed our lifestyle and the way business and education are conducted.

Together, we have also seen how vulnerable the international trade and industry supply network could be.

In the years ahead, we - the 'Covid-19 survivors' - would see how engineering management and technology could be used to tame the enormous health threats to the world and see to it how these global challenges could be overcome. In the years ahead, we would look back with professional pride and appreciate how management theory and practices had adjusted and developed amid the struggles in the disrupted world.

Indeed, this is how advancement is made throughout human history. In the coming year, CUSE would see changes in its curriculum to suit the changing times. These would coincide with the move at the faculty level at Chulalongkorn University as well as recent developments being made at our long-time partner, Warwick Manufacturing Group. These exciting developments would be announced at the appropriate time.

Together, we look forward to welcoming the new year with great expectations.

Associate Professor Chuvej Chansa-ngavej, Ph.D.
CUSE Director



OPEN HOUSE

Open House Events

On April 28th – 30th, 2021, the Faculty of Engineering, Chulalongkorn University, has held an Open House event for prospective students who plan to enroll for one of its awarded degrees, including the Dual Master's degree in Engineering Management by CUSE and WMG. The detailed information of all sessions has been recorded and archived on <https://www.facebook.com/ChulaEngineering>

Please visit the link below for the recorded session of our program (from 1.48.09 onwards).
https://fb.watch/5H5W_CJnyR/

The Office of International Affairs and Global Network (OIA), Chulalongkorn University, also held another Open House event, on August 31th – September 3rd, 2021, in order to promote all International Postgraduate Programs, including our Dual Master's degree. Please visit the OIA website for the detailed information of such an event; and, following is a link to our recorded session (from 0.48.00 onwards)
<https://www.facebook.com/ChulaOIA/videos/365463931799687>

In conversation with Mr. Kittithat Vitavaskarnvej, an analyst at PTT Public Company Limited

Why do you apply for the dual degree program at WMG?

My background was manufacturing engineering and I have worked as a production engineer at an automotive company for several years. While working, I have found that engineering skills are crucially important; but, without good management skills, my future career seems limited. Fortunately, the dual degree program at WMG could equip me with both skills at the same time; and, that is the main reason why I have applied to the program.



What are the benefits of our program from both your perspectives?

There are many major benefits I gain from this program. Firstly, due to the flexibility of the program, I can earn two Master's degrees without affecting my full-time job at the PTT Public Company Limited. All modules are well organized and delivered by WMG module tutors, who have a lot of professional working experiences in various businesses. I really enjoy all of the enrolled modules, especially when we are asked to do group activity. When combined these practical aspects with those of academic provided by the CU thesis advisor, I can fully comprehend the theories learned in classes and better apply them on the real project. This program also offers an opportunity for students to enroll for some modules at other WMG partner centers. In my case, I have a chance to join modules at both WMG (the UK) and Hong Kong campuses. It is a great opportunity for me to study while making friend with a lot of international students with different cultures – honestly, it is indeed a fond memory of mine about the program.



Research Corner

by Asst.Prof. Pisit Jarumaneeroj, the Secretary of CUSE

According to the collaboration between CUSE and Wageningen University, an EU Project Partner in the EU-funded project, EC-Asia Research Network on Integration of Global and Local Agri-Food Supply Chains Towards Sustainable Food Security (GOLF), Asst.Prof. Pisit Jarumaneeroj, a project leader, has recently published two academic papers concerning harvest planning of sugarcane in Thailand in Computers and Industrial Engineering. While the abstracts of these papers are provided herein, those who are interested in these papers may download the full papers via the following link without charges,

<https://doi.org/10.1016/j.cie.2021.107129> and
<https://doi.org/10.1016/j.cie.2021.107694>.

A multi-objective approach to sugarcane harvest planning in Thailand: Balancing output maximization, grower equity, and supply chain efficiency

This paper addresses a multi-objective sugarcane harvesting problem in Thailand, where several conflicting objectives and local restrictions are regarded as major obstacles to a sustainable sugar production environment. A multi-objective modeling approach that balances three different objectives of different key supply chain actors, namely (i) maximizing output in terms of total sugar production volume, (ii) maximizing grower equity in terms of a fair harvesting time-slot distribution, and (iii) maximizing supply chain efficiency in terms of a lower variability in resource requirements across the harvesting season, is introduced and solved by a state-of-the-art multi-objective evolutionary genetic algorithm. To better help the algorithm generate efficient solutions forming the Pareto front, two local searches are also embedded and intermittently performed during algorithm execution. Based on the information of an operating mill in Kanchanaburi Province, Thailand, we have found that our approach produces solutions that are close to optimal in terms of production output. Nonetheless, by sacrificing a small amount of production output, these solutions provide significant improvements in terms of grower equity and supply chain resource efficiency, which are crucial for the survivability of involved actors.

A Multi-Objective Modeling Approach to Harvesting Resource Scheduling: Decision Support for a More Sustainable Thai Sugar Industry

This paper develops a multi-objective modeling approach for the scheduling of harvesting resources in the Thai sugar industry, in which different objectives stemming from different industry stakeholders are concurrently optimized with the overall goal to create a more sustainable sugar supply chain. In addition to traditional economic objectives, the environmental impact of sugarcane farm burning is included into the model to better reflect the current harvesting practice, where sugarcane growers often resort to burning their fields due to the lack of available harvesting resources during the season. An evolutionary algorithm based on a variant of Particle Swarm Optimization (PSO) is also devised to help solve the resulting Multi-Objective Harvesting Resource Scheduling Problem (MOHRSP), which normally becomes intractable for real-life problem instances. We find that the proposed PSO framework is notably efficient as it provides diverse sets of non-dominated solutions with markedly low coefficients of variation in a reasonable amount of time. We also find that, by sacrificing a slight amount of sugar production volume, the whole sugar supply chain could be largely improved, especially for the sugarcane growers, whose profitability turns out to be sensitive in the trade-offs with other objectives.



Chula
Chulalongkorn University

Chula Ranked No. 1 University in Thailand and Top 50 Universities in Asia by QS Asia University Rankings 2021

QS WORLD UNIVERSITY RANKINGS

Chula Communication Center (CCC)  Chula-Chulalongkorn University

In December 2020, Chulalongkorn University was ranked Thailand's top university and 43rd in Asia by the QS Asia University Rankings 2021. This is a ranking of the world's most popular universities, with Chula achieving high scores for Academic Reputation, ranked 22nd in Asia; International Research Network, based on the number of publications co-authored with foreign researchers in the Scopus database, ranked 26th; and Employer Reputation, ranked 29th. Notably, Chula's scores in the QS Asia University Rankings have been going up over the past four years (2018–2021).



Chula No.1 in ASIA for Global Impact (No. 23 in the World)

Chulalongkorn University proudly represents Thailand as the first Thai University ranked No.1 in ASIA (and No.23 in the world*) for global impact by THE Impact Rankings 2021.

*Among 1,115 universities

THE IMPACT RANKINGS
Innovations for Society

No.1 IN ASIA
-THE IMPACT RANKINGS 2021-



Furthermore, Chulalongkorn University was recently ranked first in Asia and 23rd in the world by the Times Higher Education (THE) Impact Ranking 2021. THE is an impactful world-class ranking of 1,115 universities worldwide, and THE Impact Rankings are the only global performance tables that assess universities against the Sustainable Development Goals (SDGs).

Source:

<https://www.chula.ac.th/en/news/36901/> and

<https://www.chula.ac.th/en/news/45806/>

Commencement Ceremony



According to Chulalongkorn University's prior announcement concerning the postponement of the commencement ceremony for the 2020 academic year, Her Royal Highness Princess Maha Chakri Sirindhorn has graciously determined the date for such a ceremony on Thursday 19th and Friday 20th of May, 2022. Further announcements relevant to this ceremony will be accordingly provided in due time.

	2020	2021
No. of students admitted	17	11
No. of students graduated	16	15
• No. of students receiving Msc with distinctions	2	2
• No. of students receiving Msc with merits	13	9
• No. of students receiving Msc	1	4

CUSE

Statistics during the 2020 - 2021 Academic Year

Motto

Those who could think would thrive over those who could do.
Engineers, though, had better strive for both, i.e. Think - and do - as well.

Professor Phra Charoen Wisawakam
Longest-serving Dean of Engineering, Chulalongkorn University
(from 11 June 1929 to 18 June 1961)