CUSE

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CUSE Newsletter

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

In This Issue

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Message from the Director

Dear CUSE Community,

As we continue our mission to educate the next generation of engineering and management leaders, it is critical that we engage with the transformative technologies that are shaping our world. None is more prevalent today than Artificial Intelligence.

The rise of AI presents both immense opportunities and great challenges, and we must align ourselves with this new frontier based on our core values—, of creativity, utility, synergy and ethics:

Creativity (C): We must view AI not as a replacement for human ingenuity, but as a powerful tool to augment it. Let us use AI to automate routine tasks, analyse complex datasets, and simulate intricate systems, thereby freeing our minds to focus on the truly creative aspects of engineering: innovative design, out-of-the-box problem-solving, and visionary thinking.

Utility (U): Our engagement with AI must be driven by the pursuit of tangible benefits. I encourage you to identify specific challenges where AI can deliver significant value—from optimizing operational efficiencies to enhancing decision-making. Let's focus on developing AI solutions that are not just technologically impressive, but are practical and create real-world impact.

Synergy (S): AI offers unprecedented opportunities for collaboration. These systems can serve as a common analytical foundation. By integrating AI, we can enhance the harmonious interaction between people, processes, and technology, achieving a level of synergy that was previously unattainable.

Ethics (E): We have a profound responsibility to ensure that the AI systems we design and implement are fair, transparent, and accountable. We must proactively address potential risks such as bias and privacy concerns, building trust and ensuring that our technological advancements serve society for the better. This commitment to ethical AI is not just a guideline; it is a necessity.

I urge every member of our community—students, faculty, and alumni—to foster an AI-literate culture. Let us be bold in our experimentation, rigorous in our application, and unwavering in our ethical considerations. By embracing AI through the spirit of our CUSE values, we will not only prepare our graduates for the future but also empower them to shape it.

Together, let us leverage the power of CUSE to build a brighter, more intelligent, and more ethical future for all.

Sincerely,

Associate Professor Chuvej Chansa-ngavej, PhD
Director
Chulalongkorn University's Regional Centre for Manufacturing Systems Engineering (CUSE)

In conversation with Mr. Andres Ricardo Solano Carrillo

Technical production supervisor
E. Molding international Co.

• Have you planned your career path after graduating from the dual master's degree?

After completing the dual master's degree, I have set a clear career path focusing on advancing technical leadership and operations management within the manufacturing industry. My goal is to leverage the business knowledge gained during the program across manager level roles.

• Why did you apply for the dual degree at WMG?

I applied for the dual degree at WMG-CUSE for three main reasons. Firstly, because of its unique integration of two of the finest programs in engineering management and applied business strategy available worldwide. Secondly, as a foreigner living in Thailand, earning a degree from Chulalongkorn University represented a significant milestone for advancing my professional career in the country. I believe there are few qualifications more professionally appealing than a master's degree from the most prestigious academic institution in Thailand. Finally, the program itself stands out for its focus on real-world problem-solving, supported by industrial case studies and project-based learning. As a result, what is taught in class is more practical than theoretical, making it easier to apply directly to my business context. Coming from a production environment, I see this as an opportunity to bridge technical engineering competencies with decision-making frameworks that are critical in leadership roles.

• What are the benefits of our program from both academic and practical perspectives?

I perceive two main benefits. Academically, the program provides a robust foundation in industrial engineering—including systems thinking, project management, and financial analysis—enhanced with advanced technological knowledge such as big data analytics and system support technologies. This combination is particularly valuable for professionals whose undergraduate degree was not business-related. From a practical perspective, a tangible advantage is the ability to apply the hands-on projects and case studies directly to my current job. I have significantly improved my performance thanks to the WMG-CUSE master's degree. The program's industry and business development frameworks have immediate relevance in my work environment, as they are proven methodologies that enhance operational effectiveness.

• What are your impressions regarding our program?

It is well-structured, intellectually rigorous, and globally oriented. The blend of modules, simulations, and industry engagement makes the learning process dynamic and impactful. I particularly appreciated the diversity of classmates—I was probably the only westerner in my generation, but there were certainly expats from other Asians countries and this fact enriched discussions, and exposed me to different management cultures and industrial practices.

For the Academic Year 2024

Chulalongkorn University will hold the Commencement Ceremony for graduates of the academic year 2024 on Monday, September 29; Tuesday, September 30; and Wednesday, October 1, 2025, at the Chulalongkorn University Auditorium. In this academic year, the CUSE had about 3 graduates and we would like to congratulate them on their success.

Chulalongkorn University has been ranked among the Top 10 universities in ASEAN, and it is the only university from Thailand to achieve this distinction in the QS World University Rankings (WUR) 2026, officially announced on June 19, 2025. The university also maintained its position as Thailand's No. 1 university for the 17th consecutive year and was ranked 221st globally. Notably, Chulalongkorn University placed in the Top 100 worldwide in two key areas:

- Academic Reputation: Ranked 89th in the world
- Employment Outcomes: Ranked 64th in the world

The QS WUR 2026 evaluated 1,501 higher education institutions worldwide, and Chulalongkorn University improved its scores across all ranking indicators. This achievement is a source of great pride for Chulalongkorn University, as it reflects its internationally recognized reputation, strong academic and research capabilities, and its commitment to producing high-quality graduates.

For more details on the university rankings, please visit: https://www.topuniversities.com/world-university-rankings
Source: https://www.chula.ac.th/en/news/245274/

Research Corner

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

Transportation is regarded as one of essential elements in managing an efficient supply. This is especially apparent for the transport of perishable products that requires special temperature during long-distance transportation, due to their relatively short shelf lives and rapid deterioration rates. While ensuring the freshness of these products upon reaching their destinations is of utmost importance from the customer's perspective, it is usually not the top priority in the planning phase, as transportation planners tend to focus more on total transportation cost incurred, rather than the trade-offs between freshness of products and transportation costs. This is especially an issue in the cold chain industry that adopts multi-compartment refrigerated vehicles (MCVs), as vehicle loading and scheduling decisions must be done taking into account fresh produce's unique characteristics and the MCV usage cost at the same time.

To better explore different aspects of fresh produce transportation—namely transportation cost, carbon emissions, and total food loss—the Multi-Compartment Vehicle Loading and Scheduling Problem (MCVLSP) has been thoroughly explored by Assoc.Prof. Pisit Jarumaneeroj. One key finding worth mentioning is that the environmental objective is the most sensitive, as slight variations in either vehicle loading or scheduling decisions can lead to solutions with differing carbon emissions. Furthermore, deploying larger MCV fleets could potentially yield solutions with lower total carbon emissions and weight loss, though at the cost of a slight increase in total transportation costs. This outcome largely reflects trade-offs between the underlying economic and environmental objectives.
Those who are interested in this research paper may download the full paper via the following link without charges: https://doi.org/10.1016/j.cie.2025.110934

Eco-friendly long-haul perishable product transportation with multi-compartment vehicles

Multi-compartment refrigerated vehicles (MCVs) have been recently utilized in long-haul perishable product transportation, thanks to their flexibility in storage capacity with different temperature settings. To better understand trade-offs between economic and environmental aspects of long-haul transportation of perishable products with refrigerated vehicles, a Multi-Compartment Vehicle Loading and Scheduling Problem (MCVLSP) that minimizes three objectives—transportation cost, carbon emissions, and total food loss—is herein explored and solved by mathematical modeling and genetic algorithm (GA) approaches. Based on our computational results, large MCVLSP instances cannot be solved by the mathematical model with an off-the-shelf optimization software package. Nonetheless, the proposed GA delivers strong computational performance for MCVLSP. We also find that, among three objectives, the environmental objective is the most sensitive one as slight differences in either vehicle loading or scheduling decisions could result in solutions with varying carbon emissions. Moreover, solutions with fewer MCVs are not necessarily environmentally sustainable. Rather, deploying larger MCV fleets could potentially result in lower carbon emissions and food weight loss—albeit a slight increase in total transportation cost—due to the impacts of vehicle loading and scheduling decisions.

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)