

Architecture Department Invited Tom Svilans to Talk on the Practical Applications of Digital Timber Construction

Campus focus

The Department of Architecture, College of Engineering invited Dr. Tom Svilans from the Centre for IT and Architecture (CITA) at the Schools of Architecture, Royal Danish Academy of Fine Arts to give a lecture on October 25. The lecture was titled "Digital Timber Construction Practice: Integrating Digital Design Across the Timber Value Chain." Dr. Svilans, with rich design experience and profound insights, presented the production of timber structures and the importance of digital design and manufacturing in future architecture. The Chair of the Department of Architecture, Dr. Ying-Chang Yu, emphasized that the application of new computer technology and material engineering to timber can significantly enhance the sustainability of buildings, which aligns with the school's focus on "AI+SDGs= ∞ " as it relates to several SDGs (4, 9, 11, 12, 13, and 15).

Dr. Svilans specializes in the digital and data-driven use of timber engineering. He first shared his perspectives on the significance of future architecture and what it should entail. Given the advancements in modern engineered timber, wood can now be used on a larger scale in construction. Engineered wood offers advantages over other materials like concrete and steel, as it is lightweight, has excellent carbon sequestration efficiency, and can be prefabricated and easily processed. Therefore, through digital technology, researching the potential of timber use can make it more efficiently integrated into future construction.

The presentation covered practical applications in the field of AI, integrating smart computing and instrument measurements to optimize the entire process of wood construction, from design, material selection, timber processing, to construction. This approach aligns with the principles of SDGs and sustainable development goals, particularly in the

context of sustainable land use. The objective is to use wood materials more accurately, reducing waste in the construction process and achieving stronger construction outcomes with less material. The speaker also introduced an expanded concept of sustainability for building materials. Sustainability shouldn't just extend the lifespan of building materials but should also consider how materials can be recycled and reused after the demolition of a building, contributing to a more sustainable ecosystem.

The significance of inviting Dr. Silvans to speak was explained by Associate Professor Chen-Cheng Chen, who organized the event. He emphasized that at a time when wood was gradually forgotten in the construction industry, the pressing issue of sustainable construction due to global warming has renewed attention to wood as it has carbon reduction and carbon sink capabilities. The development of materials technology, data engineering, and digital manufacturing combined with Cross-Laminated Timber (CLT) has produced a new generation of wood with enhanced fire resistance and structural strength, making wood construction highly persuasive in contemporary building. Taiwan possesses abundant forest resources, but during the processing, up to 70% of the original timber is wasted. Therefore, through the introduction of advanced Nordic wood industry combined with information technology, the audience was made aware that each tree carries unique data. Through data engineering and smart manufacturing, wood is expected to become an enduring and important organic building material in the 21st century.

The lecture was well-attended, and both students and faculty were deeply impressed. An architecture student, Guo Wen-Jia, commented, "Professor Silvans guided us in thinking about how to apply these new digital concepts to our designs. He shared how curved wood structures are designed, calculated, and manufactured. Techniques like increasing the number of wood pieces for greater flexibility and digital fabrication opened our eyes." He further stated, "This lecture made us realize that curved wood is not only found in nature but also a part of the challenge in the future of

architecture. Curved wood represents flexibility, stability, and aesthetics, and it is all worth learning and applying." After listening to Professor Silvans' lecture, he said, "It not only enriched our knowledge but also sparked new thoughts on wooden structures. This will have a profound impact on my future professional development and guide me into exploring the future of architectural design."





