



11th Feb 2025 | @facultyofcomputingUTM



Roso's Interdisciplinary Research Team...

Innovative robotic technology and computational design for intelligent construction processes and solutions.

Professor Wang:

Extreme architect and researcher specialising in design computing and robotic fabrication.

Director of Roso Coop, Academia and Robotic Lab Management.

Research Focus

New Ways of Materialized Architecture

Digital crafting for architectural production.

Solutions for Industrial Automation
Addressing labour shortages with material, AI computation, and machines.

Integrating Software and Hardware Robots

Visual Programming tool for simulation of robot arms.

Web-based tool for robot motion simulation without software installation.

Application of technology to the 3D printing process, enabling real-time interaction with robots.

Notable Projects

Complex Geometry Sculpture:

Produced via 3D printing with a robot arm, showcasing the ability to create intricate designs.

Large-Scale Sculpture:

Printed in two parts due to machine limitations, highlighting prefabrication solutions.

Pavilion Construction:

Using 3D-printed roof tiles and analysis of material performance for a small pavilion in Taiwan.

Dynamic Molding:

Bending metal sheets using robots to generate different moulds for 3D printing.

Interior Space Design:

3D printing customised components for interior design purposes, including furniture and art.

Glass 3D Printing:

Experimenting with glass material, focusing on small pieces due to high-temperature requirements.

Concrete Freeform Structure:

3D-printed formwork and rebar reinforcement are used to create complex concrete structures.

Bamboo Art Sculpture:

Using bamboo veneer and computational design to create intricate geometric forms.

Summary of the talk:

On 11 February 2025, the students from the Faculty of Computing, Section 9, participated the talk about the ROSO, which is Robotic Solution, that is lead by the professor, Mr. Wang Shi Yuan. In this talk, we learned that the company focus on the architecture robotics. Their researches focus on two directions: the new way for architectural materialization, and the transformation between the global construction industry. They showed that their robot can help design and architecture purpose to manage the mass production. As the all of the architecture design are different, ROSO develop some new design tools for the engineers. They can just open the web and simulate the robot motion with connect to the different software. ROSO has the tour that is widely use by the different university. Their technologies had been applied to the various of design projects. The talk on the architecture robotics gives us the deepest impression, and we get to know that how uniquely designed buildings are constructed.



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Roso is working on construction robotics and how the integration of sensors and intelligent software can allow robots to function in real-world environments rather than controlled factory conditions. They developed a mobile, compact robot with a lift assist for interior spaces.

Future Goals...

Roso's goal is construction powered by AI and robotics, with a focus on deploying their developed technologies.

AUTOMATED CONSTRUCTION POWERED BY AI ROBOTS...

Roso's objective is to use robotic technology and computational design to provide intelligent construction processes and solutions, exploring emerging technologies in architecture and construction. Professor Wang leads the Roso lab and company with a team of 10-12 researchers from diverse engineering and design backgrounds. Rosso's research focuses on new ways of materialising architecture through digital crafting. They also focus on solutions for industrial labour shortages and vacation consumption of bodies.

Recognising the need for customised design tools in architecture, Roso developed visual programming tools for simulating robot arm movements. A project in 3D printing with a robot arm was described as producing complex geometry using chemistry tools to create the art piece. Another project consisted of building a 3D-printed roof tile for a small pavilion on the east coast of Taiwan.



THE "REFLECTIONS"

We can say that the opportunity for the industrial visit to talk about the ROSO industry introduction gives the Faculty of Computing UTM graphics and multimedia software student. We have learned that the company focuses on the architecture of robotics and how robotics are revolutionizing the construction and architectural industries. The talk is ROSO to bridge innovation with practicality for addressing two critical challenges, like new ways for architectural materialization and transforming the global construction industry. The visit also learned about innovative robotic technology and computational design for intelligent construction processes and solutions such as complex geometry sculpture, glass 3D printing, and automated construction powered by AI robots. We know that how to plan to use artificial intelligence (AI), computing, and robotics has inspired us to augmented reality and virtual reality and address different design challenges for the future.

