

How Can Technological Innovation Fuel the Engine of "Smart Yangpu"?

By Mao Xinhui & Yan Shuwen

Intelligent construction is shaping the future of urban development. This shift will usher in the "Construction 4.0" era, allowing for personalized and smart building solutions.

Recently, an event with the theme "Exploring the Future of Industry: Delving into Intelligent Construction" took place at the Tongji Tech Park. Its purpose was to foster collaboration between government, enterprises, and universities. The aim is to pool resources, cutting-edge technologies, and advanced production techniques to boost technological innovation.

"The event significantly broadened our horizons," remarked Zhou Yuan, General Manager of Shanghai Tongzhu Engineering Consulting Co., Ltd. He appreciated the benefits of connecting academic research with market-oriented applications, offering businesses more growth opportunities.

Focusing on intelligent construction, major design firms in the Tongji circle, like the Shanghai Survey & Design Institute, Tongji University Architectural Design Institute, and China Construction Third Engineering Bureau East China Co., Ltd., brainstormed together. Led by Professor Lu Yujie of Tongji Uni-

versity's Civil Engineering Department, they explored how intelligent construction can enable greener, low-carbon cities of the future.

During his lecture, Professor Lu Yujie shared insights on the latest global applications of intelligent construction. Companies from various construction sectors attended, promoting deeper industry integration. Lu also answered questions and shared case studies for businesses to consider.

In the Tongji knowledge economy circle, many companies mainly focus on modern design. Their growth trajectories are closely linked to broader market trends, especially the cyclical fluctuations of the real estate industry. Now, with significant changes in the modern design sector, intelligent construction is heralding a transformative phase.

At the national level, in 2020, the Ministry of Housing and Urban-Rural Development, along with thirteen other departments, jointly issued the "Guidelines on Promoting the Collaborative Development of Smart Construction and Industrialized Building." The guidelines emphasized the need to vigorously develop smart construction and enhance its innovative applications across all stages of project construction. This year, the Housing

and Urban-Rural Development Bureau of Shanghai also released the "Shanghai Urban and Rural Construction Carbon Peak Implementation Plan," advocating for a green and low-carbon transformation and encouraging the integration of smart construction with green and low-carbon development.

How can technological innovation shape the future of industry and stimulate innovation at Tongji? How can we nurture new momentum for regional development and achieve the strategic goal of building a trillion-yuan modern design industry cluster around Tongji?

"At this stage, Tongji University Science Park is enhancing its innovative industry competitiveness," shared Qian Xuebiao, General Manager of Shanghai Yangpu Tongji Science Park Co., Ltd. "Relying on Tongji University's strengths in artificial intelligence and other fields, we are leveraging 'smart+' and 'internet+' technologies to upgrade traditional industries." The vision for the future is to create a smart city and intelligent construction industry circle around Tongji University's Siping Road campus, building the new "Smart Yangpu" engine.

It's worth mentioning that at the end of last year, a pioneering technology park called "Tongji Uni-

versity Autonomous Intelligent Future Industrial Science Park" was established. This project, a collaboration between Tongji University, the Yangpu District government, and the Jiading District government in Shanghai, was chosen as one of the first nationally recognized trial locations for future industrial science parks. This innovative park, built through cooperation between the university, local authorities, and businesses, focuses on cutting-edge tech industries. It uses advances in artificial intelligence to enhance fields like civil engineering and architecture, laying the foundation for "smart construction" and "intelligent transportation" systems for future cities. Specifically, the "smart construction" component of the park is a joint effort by Tongji University, the Yangpu District government, and leading tech companies like China Construction Group, working closely to drive progress and provide services through the park's facilities.

Building this future-focused industrial science park is a key part of the country's strategy to prepare for upcoming industrial trends. The park has already dedicated space for the development of smart construction technologies, creating a hub for transforming scientific achievements into practical, industrial applica-

tions. It's also working on supportive policies for top graduates, offering various incentives for students, faculty, industry leaders, and skilled professionals from the broader community. Moreover, the park is organizing competitions in smart construction to gather more resources for innovation and entrepreneurship. It's improving its system for evaluating technological achievements, establishing a special fund for proof-of-concept studies, and setting up a "Tongji Blue Sky" verification center to speed up the conversion of technological innovations into tangible economic benefits.

Qian Xuebiao outlined that moving forward, the park is set to deepen its commitment to the directives set by the district's committee. The focus will be on nurturing innovative and entrepreneurial talent and turning groundbreaking ideas into reality. The plan is to accelerate the gathering of innovative elements, establish a high ground for the incubation of future industries, and secure a commanding position in future development trends. By attracting leading talents, the initiative aims to lead small and medium-sized enterprises in collaborative innovation, striving to reignite the innovative development of Yangpu with renewed vigor.

Robotic Combat: A Portrayal of Innovative and Vigorous "Passionate Youth"



By Mao Xinhui

When it comes to fighting competitions, the term "hot-blooded" often comes to mind. In the case of robot fighting contests, we need to add the words "cool and thrilling" to that

description.

"Smash!" "Overturn!" Recently, amidst the tempered glass-enclosed arena at the University of Shanghai for Science and Technology, bursts of cheering and applause erupt sporadically. The fervent contenders are two

fighting robots, each boasting sleek armor. The 2023 Rui Resistance Robot Developer Competition's CAIM Engineering Maker Contest (Shanghai) National Finals are taking place here.

On the field, university teams

demonstrate their unique skills, manipulating robots to dismantle their opponents' armor. Amidst the sparks of metal clashing, an intense battle ensues for several rounds without a clear winner. Ultimately, the robot "Heavily-Armed Bunny" advances after triumphing over its rival with a devastating spinning blade. "Actually, the opponent was very strong, for instance, their armor was particularly well-made. We probably won because our robot was more agile," expressed contestant Li Jianuo from Harbin Institute of Technology after the match.

Tao Huanyao, head of the intelligent combat robot competition, explains that robot fighting, as a competitive sport, became popular in the United States in the 1980s. Currently, numerous domestic universities have incorporated related elective courses and established clubs. This competition focuses on students' abilities to apply interdisciplinary basic theoretical knowledge to solve practical design, manufacturing, and innovation problems. It emphasizes engineering thinking, innovation, ethics, and teamwork.

Universities are hubs for technological productivity, talent resources, and innovative momentum. Reportedly, since the competition began, it has served thousands of universities and over 80,000 partici-

pants, attracting tens of thousands of teams from hundreds of universities nationwide. The CAIM Engineering Maker track consists of four contests: intelligent robots, "digital tri-product," information technology, and innovative simulation in robot applications. The events fully utilize practical community platforms to quantitatively assess students' maker activities.

"To win the competition, it depends partly on the design concept and what it ends up looking like, and partly on the machining process and materials, which will affect the final strength of the machine," says Tao Huanyao.

Universities are not only cradles for systematic talent cultivation but also solidify the foundation for our country's technological self-reliance and independence. Yangpu has achieved a series of significant advancements in technological innovation in recent years, yielding many pioneering and experimental results.

In the future, Yangpu will start from the concept of full-process, full-chain innovation, clearing the sources of innovation, accelerating the process, and strengthening the innovation system. The goal is to form a regional scientific and technological innovation community with bi-directional, circulatory acceleration from "0 to 10" and "10 to 0."