China a Global Pacesetter in AI Simulation

Dialogue

By Staff Reporters

"The integration of AI and simulation is one of the most powerful trends of our time — it's transforming how we design, manage and live in cities," said Professor Mohammed S. Obaidat, a computer scientist and past president and chair of board of directors of the Society for Modeling and Simulation International (SCS).

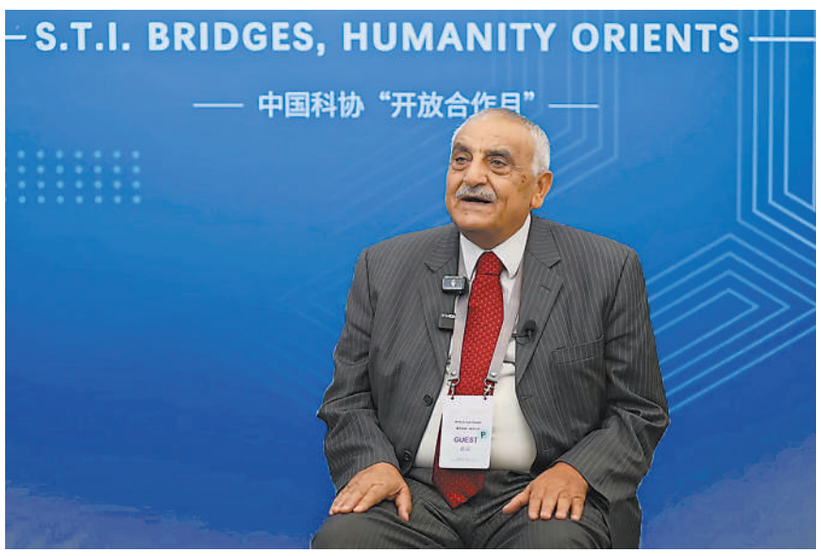
As a prominent expert in modeling and simulation since the 1980s, Obaidat has witnessed this field evolve from academic curiosity to urban necessity. In a recent interview, he noted that the convergence of AI, high-fidelity simulation, and digital twin technology is now reshaping megacities worldwide, with China emerging not just as a participant but as a global pacesetter.

Real-time intelligence for cities

In the past, simulation models were used to test scenarios pending decision making. Urban planners might simulate traffic flow using different road layouts, or energy engineers might model grid pressure during peak demand. But as Obaidat explained, AI has turned simulation into a living, responsive system.

Traditional simulation helped people make predictions. However, "AI-enhanced simulation helps us act. It creates dynamic, data-driven models that learn from real-time inputs — traffic cameras, IoT sensors, weather forecasts and continuously optimize outcomes," he said.

This shift is particularly vital in transportation. In a megacity like Beijing, where over 20 million people generate billions of mobility events daily, and static models quickly become obsolete.



Professor Mohammed S. Obaidat. (COURTESY PHOTO)

AI-simulation systems can now detect problems, such as a multi-vehicle collision on a ring road, and within seconds traffic can be rerouted, emergency services alerted and adjustments of signal timings made across adjacent districts.

The same logic applies to energy. As cities integrate solar, wind and battery storage into their grids, variability becomes a major challenge. AI-simulation platforms can forecast renewable output, anticipate spikes in demand, and simulate thousands of control strategies in milliseconds to maintain stability.

China's urban development, a global benchmark

Few places illustrate this transformation as dramatically as China. Obaidat credited China's success to a rare combination of top-down policy coherence, massive infrastructure investment, and bottom-up technological adoption.

But perhaps the most striking example is urban mobility. "Today, Beijing operates over 800 kilometers of metro, the longest network in the world, and integrates buses, ride hailing, bike sharing and high-speed rail into a single digital ecosystem," he said. This integrated transport layer provides the perfect data foundation for AI-simulation platforms to optimize everything from bus frequencies to last-mile delivery routes.

What makes China's approach globally relevant, he argues, is its scalability. "Cities like Jakarta and Lagos face similar pressures, rapid urbanization, limited public transit, and aging infrastructure. They don't need theory, [but] proven solutions. And China has them, and its experience is transferable."

Obaidat has another vision. "A smart city isn't just one with sensors and algorithms," he said. "It's one that learns from its citizens, adapts to crises, and distributes benefits equitably." In this vision, China's role is pivotal. Its ability to deploy technologies at scale, iterate rapidly, and align public and private sectors offers a template the world can study and adapt. "The future of urban life will be shaped by those who can turn data into dignity, efficiency into equity, and simulation into sustainability," he said. "And right now, China is writing some of the most important chapters of that future."

Shifting to a global ecosystem

As international scientific organizations increasingly establish offices in China, Obaidat sees both opportunity and responsibility.

"The geographic center of science is shifting toward Asia," he said. "With 1.4 billion people, world-class universities, and leadership in 5G, electric vehicles and fintech, China is a natural hub for international sci-tech cooperation."

In terms of the rapid development of AI, he cautioned that technical excellence must be matched by ethical discipline.

"One of my biggest concerns is data bias," he explained. "If an AI traffic model is trained only on data from wealthy districts, it may ignore congestion in informal settlements. If facial recognition systems lack diversity in their training data, they fail to serve marginalized groups. We need inclusive, transparent datasets and global standards to ensure them."

He therefore called for deeper institutional collaboration, praising China's growing participation in international bodies but urged reciprocal openness.

Obaidat's own collaborations reflect this vision. Over the past two decades, he has collaborated with researchers at Beihang University, Beijing University of Posts and Telecommunications, Chongqing University of Posts and Telecommunications, and other Chinese universities, publishing papers in top journals such as *IEEE Transactions*, co-editing books, and organizing joint workshops on cybersecurity, smart grids and digital twins.

Mapping the Sky: Dunhuang Star Chart

Traditional Eastern Wisdom

By BI Weizi

Dating back to the Tang dynasty (618-907), the Dunhuang Star Chart is one of the earliest known graphical depictions of the night sky in ancient Chinese astronomy. It visually corroborates star-related information recorded in early Chinese texts, and is part of a scroll that includes a series of illustrations found among the Dunhuang manuscripts.

The chart itself is the second part of a longer scroll measuring more than 300 cm by 24.4 cm, made of 13 panels of fine paper. Read from right to left, the first part of the scroll is a divination manual based on cloud shapes, a practice known as uranomancy. Just as ancient Chinese astrologers used the stars to predict future events, they also observed atmospheric phenomena.

The chart divides the sky into 12 sections representing the months of the Chinese year, beginning with December. These sections are spaced at 30° intervals, moving from east to west. Each section is accompanied by text describing the sky and providing astrological predictions for events in different parts of the Chinese Empire.

This detailed star atlas shows more than 1,300 stars. The positioning is remarkably accurate for a hand-drawn document and compares favorably with modern charts.

The 13th and final chart depicts the north circumpolar region. This is the area of the sky towards which the Earth is tilted on its axis. As the Earth remains tilted in the same direction throughout its orbit around the Sun, these stars remain visible in the night sky all year round. Other stars are only visible seasonally.

In ancient China, the celestial north pole was considered to be the center of the sky. According to Chinese astrology, this is the most important part of the cosmos, housing the "three enclosures."

As well as its historical significance, the atlas is important for modern astronomers because of its accuracy and graphic quality. Like the Earth, the sky is spherical and appears to us as a dome. The process of converting points from a spherical object onto a flat piece of paper is known as "projection" in map making and involves complicated mathematics.

Are Low GI Foods Always Healthy?

Science Outreach

By BI Weizi & SUN Yue

In many supermarkets, low glycemic index (GI) foods are prominently displayed, occupying almost half of the shelves. However, *Science and Technology Daily* reporters' investigation found that these low GI foods are generally priced 30 percent to 50 percent higher than similar products.

As the concept of healthy eating is now more widely accepted, low GI has gone from a professional nutritional term to a popular consumer buzzword. However, many consumers have unanswered questions about the health benefits of low GI foods and its masquerading as a marketing gimmick. To address these questions and demystify these food groups, the reporters sought answers from experts in the field.

The GI ranks carbohydrate-containing foods from 0 to 100, based on how quickly they raise blood sugar. According to China's national standards, foods with a GI of and below 55 can be labelled as low GI. These foods are characterized by a slow rise in blood sugar after consumption and a strong feeling of satiety, which theoretically helps stabilize blood sugar levels after a meal. Examples of low GI foods include legumes, non-starchy vegetables, fruits, whole grains and dairy.

"GI is a voluntary labelling item for food products. The initial purpose of labelling is to protect consumers' right to know and facilitate food choices for specific groups," explained Fan Zhihong, a professor at the College of Food Science and Nutritional Engineering at China Agricultural University.

Businesses cannot simply implement low-GI labelling at will. According to the Technical Specifications for Low GI Product Certification, businesses must submit their products to a qualified national certification body for testing. Consequently, an increasing number of consumers believe that foods labelled low GI are necessarily low-sugar, low-fat and low-calorie health foods.

Is this really the case? "Low GI does not equal low calorie, Fan explained further. The GI value primarily describes foods high in carbohydrates. If a food contains a high proportion of fat or protein and a low proportion of carbohydrates, blood sugar levels may rise slowly after consumption, but the total calorie content may be high.

In other words, a low GI cake that is high in oil and sugar may contain far more calories than a banana with a slightly higher GI that is rich in dietary fiber.

Experts warn that the health value of a food is not solely dependent on its GI value, and that it is essential to consider its fat, sodium, dietary fiber, vitamin and mineral content too. Determining a food's health value based solely on its low GI label is neither comprehensive nor scientifically sound.

Sun Yu, director of the Department of Endocrinology at Xuanwu Hospital of Capital Medical University, advises consumers to carefully check the ingredient list and nutrition facts label when purchasing food, as well as paying attention to whether it has a low GI label.

"If a low GI food has butter, cream and white sugar high on its ingredient list and its nutrition facts label shows high levels of fat and sodium, this means its calorie content is likely to be excessive. Therefore, even if it has a low GI value, it cannot be considered a healthy food," Sun added.

Tech+Culture

Tech Shines Light on Ancient Mysteries

By Staff Reporters

The Chinese Academy of Social Sciences (CASS) has announced its first batch of major research achievements in 2026, demonstrating how modern scientific methods are fundamentally reshaping the understanding of early Chinese civilization.

Animal bones tell stories of coexistence

The construction of China's national animal specimen library has made substantial progress since its launch in 2025, and is now home to over 100,000 specimens collected from 121 archaeological sites across 26 provinces. Including both ancient animal bones and modern reference samples, the library forms precious resource for unearthing the co-evolution of humans and animals.

Among its most significant items are the oldest known domestic dog remains in China, dating back to approximately 10,000 years ago, whose carbon and nitrogen isotope ratios reveal that early humans shared their food with their canines. The earliest domestic cattle bones were found in central China, dating back to approximately 4,500 years ago, showing a move toward the use of livestock in daily life. The skeletal remains of the extinct sacred buffalo (Bubalus mephistopheles) from 8,000 years ago, helps to understand the role of biodiversity and ecological change.

Silk whispers rewrite textile origins

A tiny silk fragment from the Xuewei No.1 Tomb, part of the Reshui Tomb Cluster in Dulan county, northwest China's Qinghai province, has rewritten global textile history. Through radiocarbon dating calibrated with dendrochronological data, researchers confirmed the fabric was woven no later than 750 CE, making it the world's earliest scientifically verified resist-dyed textile.

Further analysis identified the presence of Phellodendron chinense, a dye plant native to Sichuan, linking the fragment to historical records of "banbu" (spotted cloth), a luxury textile listed as a regional tribute during the Tang dynasty. This discovery definitively proves that Sichuan and its surrounds were the origin of this resist-dyeing technique and not India as some have thought.

Millet maps the rise of farming society

Multi-disciplinary research has also clarified the timeline of dryland agriculture in northern China. Excavations at the Sitai site in Hebei province revealed semi-sedentary settlements dating back to around 10,000 years ago, coinciding with early evidence of millet use at the nearby Donghulin site. This supports the hypothesis that the mountainous zone near 40° N in north China may have served as a cradle of Chinese agriculture.

Isotopic analysis of human remains from Xinglongwa and Xinglonggou in Inner Mongolia autonomous region, dating back to 7,800-7,500 years ago, shows that foxtail and broomcorn millet made up about 70 percent of the diet, proving the establishment of an agricultural society. Data from later sites, such as Ma'anqiaoshan in Liaoning province and Zhengjiagou in Hebei province, indicate that 6,200-5,000 years ago, during the Hongshan culture period, millet consumption had risen to approximately 80 percent, showing how farming had become part of daily life and social order.

Scientific validation for the 'hometown of bayberries'

At the Shiao site in Yuyao, Zhejiang province, a key Liangzhu culture settlement dating back to 5,000 years ago, archaeologists uncovered two parallel tree trunks from 2520 BCE. Through comparative wood anatomy and chemical profiling, the specimens were identified as Chinese bayberry (Myrica rubra). The ancient samples shared 12 out of 13 major organic compounds with modern bayberry wood, confirming they belong to the same species.

Wang Shuzhi, a researcher at the Institute of Archaeology, CASS, said that this constitutes the earliest proof of bayberry use in China and provides scientific validation for Yuyao's enduring identity as the "hometown of bayberries," suggesting that this fruit was already part of the human diet during the Liangzhu era.

Ripe Chinese bayberries in an orchard in Kuangyan town, Cixi county, Zhejiang province. (PHOTO: XINHUA)

Wind Power Aids Africa's Green Transformation

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For example, during the construction and commissioning of the Aysha II Wind Power Plant, local technicians gradually mastered wind turbine installation and system operation skills through participation in the technical training.

Professional personnel are vital to the green transformation of Africa, and technical training is an important part of China-Africa cooperation.

The De Aar Wind Farm in Northern Cape, South Africa, is the first wind power project financed, constructed and operated by a Chinese company in Africa. It has a technical team comprising of over 80 percent local technicians, and the project has trained over a hundred young locals, many of whom can now independently handle operation and maintenance tasks.

Apart from technical training, the company also provides educational and medical support to nearby schools and residents through scholarship programs and community projects, gradually transforming the wind farm into a comprehensive platform for social development.

Meanwhile, the Amunet Wind Power Plant in Egypt has been included in the country's medium- and long-term energy development plan, closely aligning with its port economy and industrial system. Wind power projects provide not only electricity but also the fundamental conditions that support manufacturing, logistics systems and urbanization processes.

The accelerated transition of global energy has seen cooperation between China and Africa on clean energy like wind power, which is driving deeper industrial restructuring and the transformation of development models.