

Master of Algorithms, a Humble Pioneer

Dialogue

By Staff Reporters

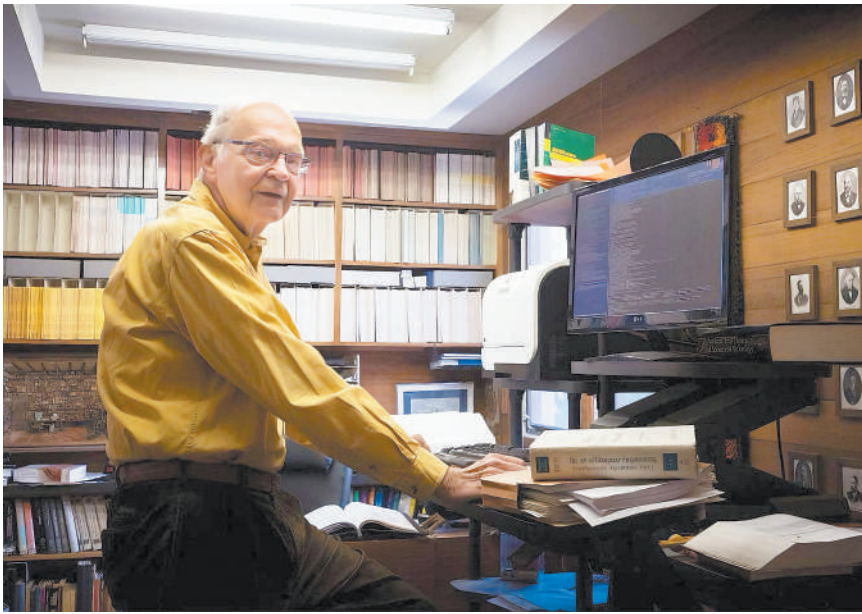
In the world of computer sciences, few books are held in as high esteem as *The Art of Computer Programming (TAOCP)*, a multivolume masterpiece by Stanford professor emeritus Donald Knuth. It's the kind of book that prompted Bill Gates to say, "If you think you're a really good programmer, read [Knuth's] *The Art of Computer Programming*. You should definitely send me a résumé if you can read the whole thing."

But despite his contributions to computer science, Knuth, now 87 years old, still stays humble and down-to-earth and remains passionate about writing and sharing knowledge.

Origins of a legend

Born in the U.S., Knuth is often referred to as a "pioneer of modern computer science." His work introduced two core concepts that are fundamental to the field: algorithms and data structures. Beyond that, he invented TeX, the typesetting system that became a standard in academia, and Metafont, a font design system. His groundbreaking research and innovations have shaped the direction of theoretical computer science in profound ways.

Knuth's crowning achievement is undoubtedly the *TAOCP*, a series of volumes first published in 1968. Today, the books are considered a touchstone for anyone serious about understanding algorithms and programming languages. In fact, by the end of the 20th century, the *TAOCP* was named one of the "best 12 physical-science monographs of the century," alongside *Principles of Quantum Mechanics* by Dirac and *Theory of Relativity* by Einstein and other world-



Professor Donald Knuth. (COURTESY PHOTO)

renowned masterpieces.

The work's impact was so profound, that it earned Knuth the prestigious Turing Award in 1974, making him the youngest recipient at just 36 years old, a record that still stands. However, he downplays his status as a pioneer. Reflecting on his journey, he said, "I have never thought of myself as a trailblazer. I prefer to see myself as a recorder of the development of algorithms."

Roots of TAOCP

The story behind the *TAOCP* is as fascinating as the work itself. Back in 1962, when Knuth was a young mathematics PhD student at Caltech, he was approached by a publisher to write a book on compilers. But as he began his research, Knuth quickly realized that computer science was still in its infancy, and the literature on the topic was sparse and of uneven quality.

Despite these challenges, Knuth was determined to create a comprehensive resource that would systematize

the understanding of algorithms. His initial manuscript for *TAOCP* grew to an astounding 3,000 handwritten pages by 1965, and Knuth began to rethink the scope of the work, ultimately planning it as a seven-volume series.

Currently, three of those volumes have been published, with the fourth volume's first part "A," already available in Chinese. The English version of the fourth volume, part C, was published in 2024. However, Knuth admits that finishing the entire series may take longer than he anticipates. "This field is so exciting, and there's always something new happening. I don't know how long I'll live, but I'll write as much as I can."

Symphony to be continued

For Knuth, writing the book series has been a lifelong pursuit. Despite his fame and the vast recognition he's received, he remains dedicated to advancing the field.

Knuth's curiosity and critical thinking remain sharp. He is interested in the present state of AI and in the future

scenarios it might bring.

In 2022, when OpenAI released its ChatGPT model, Knuth, ever curious about emerging technologies, tested the system with a series of tricky questions to see how it would handle them. His questions included "Will the Nasdaq index rise on Saturday?" (a question about a stock market that's closed on Saturdays) and "Write a sentence using exactly five letters." While impressed by the system's eloquent responses, Knuth noted, "ChatGPT is much better than 99 percent of the writing out there. But it also makes some surprising errors."

A lifetime of honors, and a humble heart

Throughout his illustrious career, Knuth has received numerous accolades, including the Grace Hopper Award, the National Medal of Science, and over 100 other prestigious honors. Despite all the recognition, he remains grounded. "I'm very grateful for all the honors, but I'm also a bit uneasy. I worry that people might start to think I'm an all-knowing figure, and that when I express an opinion, it might be taken as more authoritative than it really is," he explained.

He also shared an interesting anecdote: after receiving the Turing Award, Knuth didn't place the silver trophy on a pedestal like most recipients would. Instead, he used it as a bowl for strawberries and ice cream.

Knuth's approach to life is a reminder that even those with the greatest minds remain humble, always learning and always questioning. His relentless pursuit of knowledge reflects the very essence of what it means to be a lifelong learner.

This article was edited based on the original version written by ZHANG Xinxin from Cover News based in Chengdu, Sichuan province.

My China Story

My Bond with China Through Spring Festival

By Kashan Khan

When I first stepped foot in China in 2016, I was a young graduate eager to pursue my master's degree in civil engineering at Tianjin University. Little did I know that this country, with its 5,000 years of history and culture, would not only become my second home but weave itself into the fabric of my identity.

Now, after nine years, countless memories, and a journey that has taken me from student to university teacher, the Spring Festival stands out as the heartbeat of my connection with China — a festival that weaves together nostalgia, joy, and hope in a way that no other celebration does.

Red. That is the color of the Spring Festival, and the color of my memories. It is the color of lanterns glowing in the crisp winter air, the color of couplets neatly hung on doors, and the color of the fireworks across the night sky. It is also the color of warmth and togetherness, of new beginnings and the shared joy of a nation.

It is not just about tradition; it is about how China masterfully combines its ancient customs with modern innovation. I am inspired by how China incorporates modern science and technology into everyday life — even during its most traditional festivals.

For example, the transformation of the traditional red envelopes containing "gift money" into "digital red envelopes", which enables people across the country to share them instantly through mobile apps. Livestreamed galas and online celebrations have made the festival more accessible, bridging distances for millions of families. These innovations reflect the core of China's development: preserving tradition while embracing the future.

During my years as a student in China, I celebrated the Spring Festival not only with my family back home, but with my new family here — friends, both local and international. We would transform our dormitory rooms with decorations: "Fu" characters written on red paper pasted upside down for good luck, red lanterns dangling from windows, and simple fairy lights adding a cozy glow.

Dumpling-making was an art we never quite mastered — our dumplings were often misshapen, and occasionally split open while being cooked, which made us laugh, and that was the real magic.

I remember one year, we attempted to sing traditional Spring Festival songs. None of us sang well, and most of us stumbled over the words, but it didn't matter. In those moments, it felt like the boundaries of language, culture, and nationality dissolved, and we became one.



Kashan Khan. (COURTESY PHOTO)

I will never forget last year's Spring Festival Gala, hosted by the Tianjin Municipal Foreign Affairs Office. I watched performances that brought Chinese culture to life in the most mesmerizing way. There were acrobatics, traditional dances, and music that carried the stories of the past centuries. That night, I realized just how much China values inclusivity and talent.

Later, as the city erupted in a symphony of fireworks, I stood under the dazzling sky and felt the pulse of a nation that has worked tirelessly to honor its traditions while embracing the future.

Last year marked a significant turning point in my life. I completed my PhD and began my journey as a lecturer. The Spring Festival remains a cherished constant — a time for reflection, celebration, and connection.

This year, I celebrated it in Zhejiang province, where I was invited to another gala event. It was a reminder that no matter where I am in China, I am not an outsider. I often tell my friends "I've never been treated as an outsider; I've already become half-Chinese." The invitation was not just an acknowledgment of my work in China, it was a testament to the bonds I've built over the years.

For me, the Spring Festival is more than a celebration. It's a bridge between the past and the present, between my home country Pakistan and China, between tradition and progress. I've embraced the mission of understanding China's spirit, telling its stories, and sharing its voice with the world. The Spring Festival is the perfect opportunity to do just that — to show how China's rich history, modern achievements, and the warmth of its people come together in harmony.

The author is a Pakistani teacher from Tianjin University's School of Civil Engineering.

Experiencing the Charm of Spring Festival

Expats Activity

By Staff Reporters

The Spring Festival, brimming with tradition and festivities, showcases the unique charm and rich diversity of Chinese culture. In recent years, various regions across China have been organizing events for foreign experts to introduce them to Chinese traditions. These activities not only highlight the beauty of Chinese culture but also foster deeper understanding and appreciation in international guests.

Recently, over 80 experts from more than 30 countries, including the U.S., the UK, Germany, Italy, Japan and

Bolivia, attended the Beijing-Tianjin-Hebei Foreign Experts Spring Festival Gathering in Beijing.

American sociologist, writer and musician Mark Levine, a recipient of the Chinese Government Friendship Award in 2014, shared his story of singing about China's rapid development to the world.

At the event, he sang "Where Is the Road?" and "Only Here Is My Heart's Destination," both reflecting his deep affection for China. The gathering also saw the participants engage in traditional Chinese crafts such as calligraphy, seal carving, lantern making, face painting and other traditional cultural activities.

They were also given a tour of Beijing's "Two Zones" Exhibition Hall, the

Beijing Grand Canal Museum, and Mengniu Dairy Co. Hun Kim, acting vice president of the Asian Infrastructure Investment Bank (AIIB), applauded Beijing's improving environment and spoke of AIIB's commitment to investing in clean energy, sustainable cities, and urban highways, hoping to contribute to Beijing's urban development.

Franz Michael Dolg, a German professor from Beijing Normal University, highlighted China's scenic beauty, profound cultural heritage, rapid technological advancement, and warm-hearted people. He said events like the Spring Festival meeting strengthen friendship and academic exchanges between Chinese and foreign researchers.

Hosam Farouk Ahmed Hohamed Elmaghrabi, an Egyptian journalist with

the online media organization China.org.cn, spoke about not only experiencing the charm of traditional Chinese culture but also witnessing modern China's development achievements.

Similar events were held in other cities as well, like "My Spring Festival in Anhui" in Hefei city, capital of Anhui province, and the Spring Festival celebration for foreign experts in Guangxi Zhuang autonomous region. Such events offer a window to Chinese culture and traditions, fostering mutual understanding and friendship.

Through these enriching experiences, foreign experts are encouraged to integrate more deeply into Chinese society, contributing their skills and knowledge while discovering new opportunities in this land of possibilities.

How Guibiao Tells Time

Traditional Eastern Wisdom

By BI Weizi

The guibiao or gnomon is an astronomical instrument used to measure the length of the sun's shadow. It consists of two parts. The straight rod placed perpendicular to the ground is called "biao," and the ruler or dial placed horizontally on the ground with a scale engraved on it to measure the length of the sun's shadow is "gui."

In different seasons, the sun rises and sets in different directions and its altitudes at noon are different too, governed by the law of periodic changes.

According to the shadow cast by

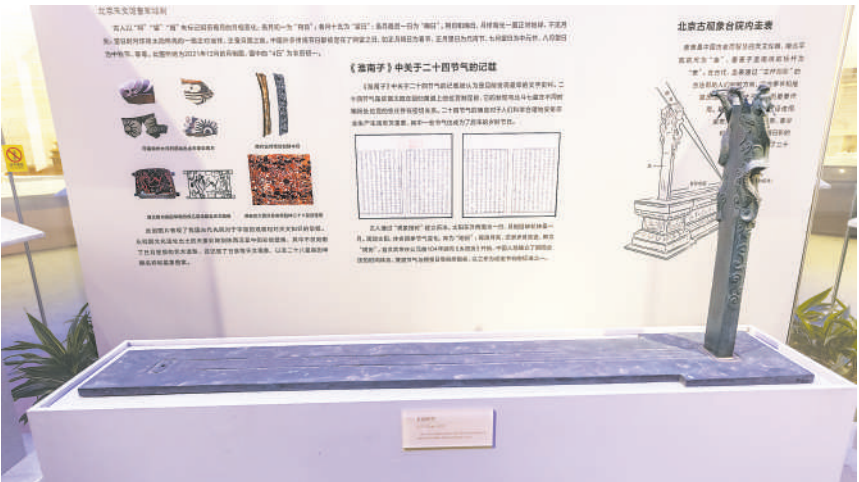
the sun on the guibiao, the daily and annual changes in the sun's position can be measured, compared and calibrated. In this way, time is measured, the seasons are divided, and the calendar is formulated. Guibiao shadow measurement is one of the most important observation methods in ancient Chinese astronomy.

The ancient Chinese learned to set up a biao to measure the shadow after observing their own shadows under the sun.

As early as the 20th century BC, the guibiao shadow measurement method was used in the central plains of China. In the Han Dynasty, scholars used the length of the sun's shadow on a guibiao to determine the "24 solar terms."

The guibiao is also used to determine the dates of the future solar year,

which is an important basis for planning agricultural activities.



A model guibiao at the Capital Museum in Beijing. (PHOTO: VCG)

China-built Hydropower Project Energizes Zambia

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In addition, the project has created about 15,000 jobs for locals and empowered the development of industries, including building materials, commerce, transport and mining sectors.

Boosted by the KGL, the local government plans to build a new town with a population of about 5,000. PowerChina

has also built schools and roads for the surrounding villagers.

In recent years, China and Zambia have carried out cooperation in many fields, at various levels, such as the new Simon Mwansa Kapwepwe International Airport and Kafue Bulk Water Supply Project, under the framework of BRI and the Forum on China-Africa Cooperation.

Key Initiatives Advance Digital Transformation

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Alibaba's ModelScope platform has made over 900 pre-trained models available, fostering innovation across fields such as natural language processing and computer vision. This open approach has lowered the barriers for developers and accelerated the application of AI technologies.

Supported by robust policies and investments, China's digital transformation journey is steadily progressing. By aligning innovation with sustainability and focusing on cutting-edge technologies, the country is shaping a path toward a resilient digital economy, and a vibrant and tech-enabled society.