“Shu Zuo Yu Cheng” System Launched: Smart e-Pen Enables Automated Layout for Creative Works

Campus focus

Tamkang University’s self-developed Smart e-Pen System has achieved another innovative milestone with the recent launch of “Shu Zuo Yu Cheng—An Automatic Layout System for Calligraphy Works” (「書作玉成——書法作品自動編排系統」). By integrating AI technologies, the system assists e-pen calligraphy creators in rapidly completing composition design and signature placement, thereby significantly enhancing the overall quality of e-pen calligraphy in pre-print production. The launch press conference was hosted by Secretary-General Dr. Yu-Pei Ma, with Dr. Tzung-Hang Lee, Dean of the Colleges of Engineering and Artificial Innovative Intelligence, leading the Smart e-Pen research and development team. Renowned calligraphy master and Director of the Carrie Chang Fine Arts Center, Ben-Hang Chang, provided a live system demonstration. Hands-on writing sessions were also arranged, showcasing the system’s practical applications.

Dean Lee explained that the “Shu Zuo Yu Cheng” system was led by Professor Wen-Bing Horng of the Department of Computer Science and Information Engineering, with continued optimization by Professor Chi-Yi Lin and his Research Assistant Hung-Di Wang. Built upon the Smart e-Pen framework, the research team incorporated extensive data analysis and AI technologies to help calligraphy creators progressively refine their works to an ideal state. Calligraphy master Chang noted, “Even learners with a solid foundation often find it difficult to produce the calligraphy they envision, which can be frustrating. This system enables e-pen calligraphers to achieve satisfying arrangements—from layout to signature placement.” Completed works can be saved digitally or printed as valuable references for learning and practice.

In terms of functionality, “Shu Zuo Yu Cheng” emphasizes a high degree of personalization. The system features a comprehensive database of multiple calligraphy styles, including seal, clerical, regular, running, and cursive

scripts. Users can freely import selected or custom poetry and text, set signature content, and allow the system to automatically complete layout and formatting, with further adjustments available as needed.

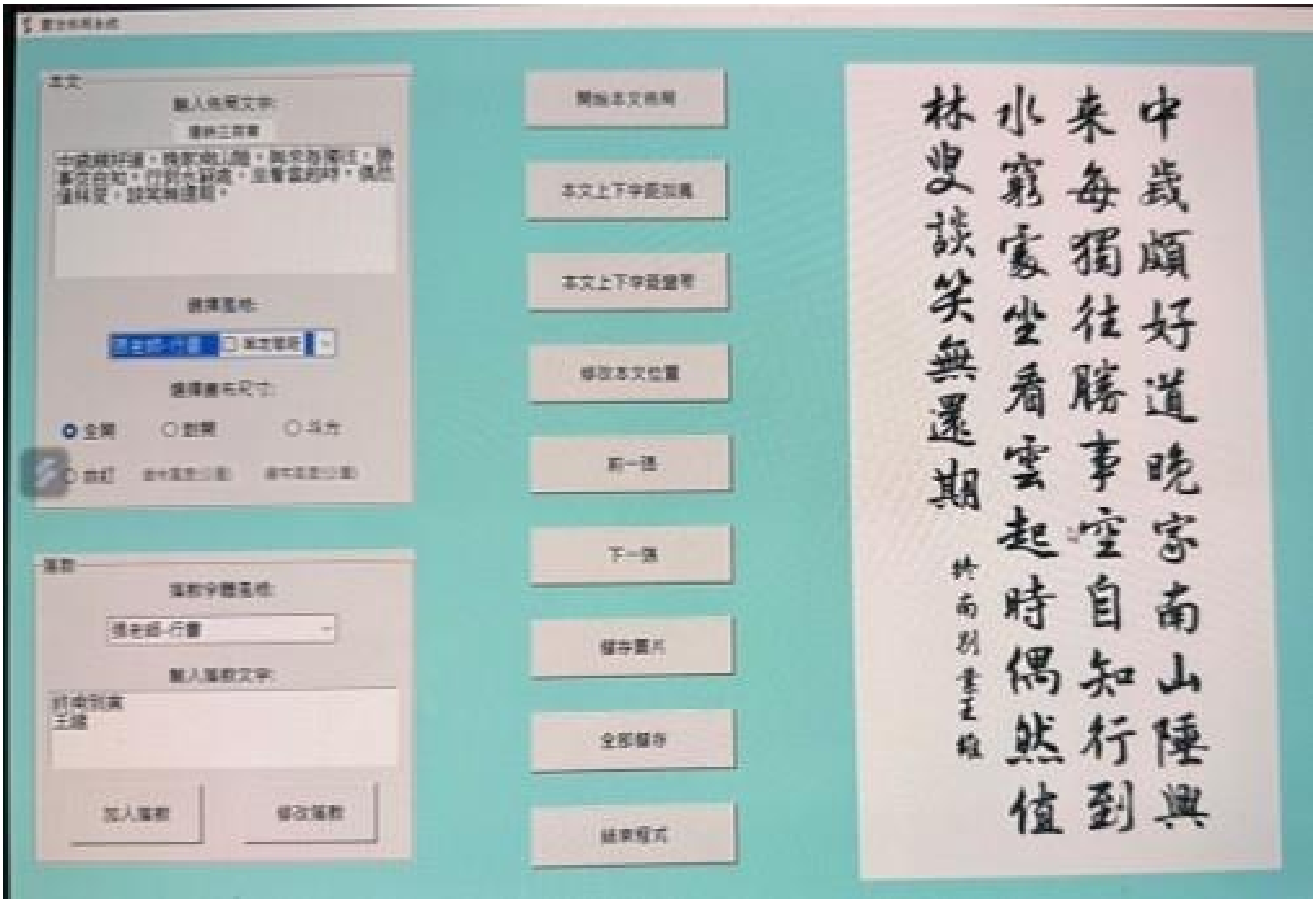
Currently, the system incorporates Youren Yu's Standard Cursive Script, with missing characters generated through AI technology and seamlessly integrated with various e-pen writing styles. Once a work is completed, the system dynamically displays the entire stroke sequence in real time. This feature provides intuitive and concrete learning support, particularly for scripts with complex stroke orders such as cursive and seal scripts. Users may also directly input text or select poetry from a Tang-dynasty database, enabling the system to automatically generate layout and signature placement, thereby significantly reducing the time traditionally required for calligraphy learning and creation.

To enhance accessibility, "Shu Zuo Yu Cheng" has been deployed as an online platform, freely available to interested learners. Prof. Lin noted that the web-based design eliminates the need to download large image files previously required, allowing users to enter the system directly for writing and learning, significantly improving operational smoothness and user experience.

Tamkang University's Dual-Track Smart e-Pen Development Project is co-directed by Master Chang and Dean Lee, featuring two major development tracks: Track A: Digital Optimization, focusing on enhancing and applying traditional handwriting through digital means Track B: Digital Transformation, supported by funding from alumnus and Win Semiconductor Chairman Chin-Tsai Chen, which introduces AI technologies to drive innovation toward personalized typography. Key achievements include systems for standard cursive script retrieval and generation, aesthetic handwriting analysis, expressive free-flow calligraphy, eye-tracking experiments, cloud-based networking systems, and the automatic calligraphy layout system "Shu Zuo Yu Cheng."

Dean Lee further emphasized that "The research outcomes of Track B are not only independently functional, but will ultimately be integrated into a unique, comprehensive personalized typography system." The

interdisciplinary research team is led by Dean Lee. It includes Professors Wen-Bin Horng, Chen Chien-Chang, Chi-Yi Lin, Assistant Professor Meng-Luen Wu of the Department of Computer Science and Information Engineering, and Assistant Professor Chieh-Ying Chang of the Department of English, collectively advancing cross-disciplinary innovation in calligraphy and technology.



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