CHEN TIANQIAO & CHRISSY INSTITUTE

Chen Institute Science Writers Fellowship

Name Inaugural Chen Scholars Retreat
Date October 17, 2024
Location Boston

Meeting Report

Inaugural Chen Scholars Retreat Successfully Held in October 2024: A new era for AI and the Brain

On October 17th, during Autumn on the East Coast, The Tianqiao and Chrissy Chen Institute (TCCI) held its first ever Chen Scholars Retreat at the Boston Public Library.

The Boston Public Library was the first library in the world to be open to all citizens for free borrowing and is known as the "People's Palace." Similarly, Tianqiao and Chrissy Chen Institute has always advocated openness, and sharing that benefits mankind. Over the years, TCCI has been committed to promoting the integration and development of brain science and artificial intelligence, and has contributed to the progress of this field through a series of measures such as developing programs and initiatives that support early-career scientists, technology development, cornerstone partnerships and interdisciplinary research.

Looking back on the development process, **Ms. Luo Qianqian, TCCI cofounder**, said at the beginning of her speech:

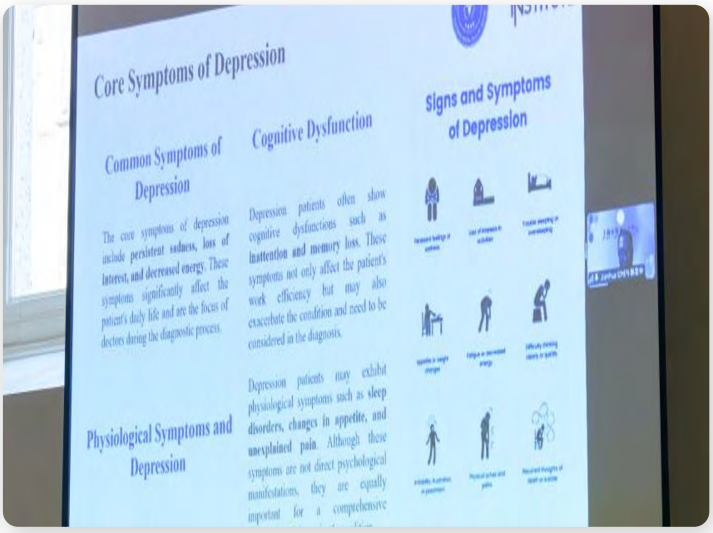
> *"Since the establishment of the Tianqiao Brain Science Institute in 2016, we have had a dream – to build an ecosystem that empowers outstanding scientists to create breakthroughs that will change the history of mankind. We know that exploring the brain is challenging, but it's the challenge that motivates us to keep moving forward."*

In-depth dialogue, enlightening new knowledge

At the Chen Scholars Retreat, Chen scholars from Mayo Clinic, Mass General Hospital, UCSF and Stanford who are studying using AI in medicine to improve patient care and outcomes gathered together to explore the future of brain science and artificial intelligence.

Professor Chen Liang from **Huashan Hospital, Professor Chen Jianhua from Shanghai Mental Health Center, and Dr. Geng Haiyang from Tianqiao Institute of Brain Science** represented The Frontier

Laboratory of Applied Neurotechnology and the Frontier Laboratory of Artificial Intelligence and Mental Health, two cutting-edge laboratories established by Tianqiao Institute of Brain Science in China. They introduced the important achievements made in BCI technology research and development and a new generation of AI models to Chen Scholars in attendance.



Report on the results of the Chen Frontier Laboratories of the Tianqiao Brain Science Research Institute (Zoom presenter, slide display).

- Professor Liang Chen introduced the innovative work of the Chen Frontier Laboratory of Applied Neurotechnology in the research paradigm of deep brain stimulation (DBS), which is implanted into both NAc and aIC brain regions to improve emotional regulation and cognitive function. In addition, a clinical study jointly conducted by Chen and the Shanghai Mental Health Center implanted DBS in 28 patients with severe mental illness within two years, and the follow-up observation showed that the patients who had received DBS experienced obvious improvement of disease symptoms. The Chen Scholars expressed their expectation that DBS would be used in the treatment of severe mental illness.
- Professor Jianhua Chen shared the progress of the Chen Frontier Lab for Artificial Intelligence and Mental Health in the application of large language models (LLMs) in the study of mental disorders.

Based on real-world clinical consultation data from the Shanghai Mental Health Center, they are building a large model to help improve the accuracy of the diagnosis of depression and anxiety, and the project has now collected 4,500 sets of high-quality raw data. During the discussion session, Professor Chen Jianhua and Chen Scholars discussed the research potential of "using LLM to evaluate the therapeutic effect of antidepressants and guide personalized medicine".

In the Chen Scholars Academic Report session, Chen scholars from Massachusetts General Hospital, Mayo Clinic, University of California, San Francisco, and Stanford University reported their latest research results in the field of neurology and artificial intelligence, and shared their views on future development trends, challenges and opportunities. From basic theoretical research to clinical application practice, from algorithm optimization to data analysis, there were some groundbreaking research results, which not only promote the in-depth development of neuroscience research, but also expand new boundaries for the application of AI technology.

Pietro Perona, Allen E. Puckett Professor of Electrical Engineering, Caltech

Sham Kakade, Ph, Co-director of the Kempner Institute, Gordon McKay Professor of Computer Science and Statistics, Harvard

Bernardo Sabatini, MD, PhD, Co-director of the Kempner Institute. Alice and Rodman W. Moorhead III Professor of Neurobiology, Investigator, Howard Hughes Medical Institute, Harvard Medical School

David Anderson, Seymour Benzer Professor of Biology; Tianqiao and Chrissy Chen Institute for Neuroscience Leadership Chair; Investigator, Howard Hughes Medical Institute; Director, Tianqiao and Chrissy Chen Institute for Neuroscience

In addition to the presentations by the Chen Scholars, two guest speakers from Harvard University, Sham Kakade, Professor of Computer Science and Statistics, and Bernardo Sabatini, Professor of the Department of Neurobiology at Harvard Medical School, alternately shared their academic research and cutting-edge thinking in the fields of artificial intelligence and neuroscience.

- Sabatini said, "Neuronal communication in the brain takes place in a very complex and noisy way, in contrast to the inter-node connections that we can specify when training artificial systems. This suggests that the way the brain functions may be fundamentally different from our conventional understanding."
- Sham Kakade, on the other hand, points out that "when it comes to training large base models, it often takes months. As the amount of data increases, we don't want the time it takes to train the algorithm to also increase exponentially. Therefore, how to improve the operational efficiency of the optimization algorithm is a key issue."

Poster exhibition of TCCI's innovative projects

Hand-in-hand to create brilliance

Looking forward to the future, the Tianqiao and Chrissy Chen Institute will uphold its original aspiration and is committed to promoting the integrated development of neuroscience and AI; Strengthening cooperation and exchanges with top international academic institutions to build a broader academic platform; Intensifying talent training efforts to cultivate more outstanding young talent in the field of neuroscience and AI integration; continuing to deepen scientific research and innovation, and encouraging the transformation of innovation achievements. In terms of data sharing, ethics, privacy protection, etc., we also continue to explore solutions to support the healthy development neuroscience and AI.

We have always wanted to enhance people's life experiences through our understanding of how the brain perceives, understands and communicates with the outside world. Over the years, the Chen Institute has been making a lot of continuous efforts to promote the development of brain science and artificial intelligence for the benefit of mankind. "In the temple of knowledge at the Boston Public Library, the inaugural Chen Scholars Retreat came to a successful conclusion, inspiring attendees to continue moving forward yp create a brighter future together.

A mix of the Chen scholars, speakers and TCCI attendees at the Chen Scholars 2024 Retreat.

Mo Wang is the TCCI NextQuestion media editor. She wrote this meeting report as part of the Tianqiao and Chrissy Chen Institute Science Writers Fellowship which aims to extend the conversation Beyond the meeting with the hopes of sparking new ideas and collaborations.