





# SHUANG-HO HOSPITAL ELEVATES RESEARCH WITH ADVANCED GPU SYSTEMS FROM SUPERMICRO

Supermicro, Micron, and AMD Collaborate to Open a New Chapter in AI Healthcare



Supermicro AS-5014A-TT Workstation

## Introduction

The AI application in developing smart healthcare has become an established global trend and is critically important to the medical industry in Taiwan. Shuang-Ho Hospital has made significant progress in the field of AI brain imaging interpretation, assisting physicians in making more accurate diagnoses. Therefore, the Shuang-Ho Hospital is an ideal model for developing AI healthcare for regional hospitals in Taiwan.

To provide patients with better quality healthcare, many hospitals are actively investing in smart healthcare and promoting the application of AI technology to analyze medical images in hopes of discovering hidden lesions in advance and attaining the purpose of early detection and treatment. However, patients' privacy is the precondition for the development of smart healthcare and must be protected at every stage, from data acquisition, exploration, modeling, and actual deployment.

However, the expenditure on developing AI healthcare is usually relatively high, as it costs tens of thousands of dollars (TWD) to build an AI server, which most regional hospitals can't afford. Shuang-Ho Hospital of the Ministry of Health and Welfare has selected the Supermicro AS-5014A-TT workstation from Supermicro, which includes AMD CPUs and Micron memory modules. The workstation has shown significant capabilities in the field of AI brain imaging interpretation. The workstations can help doctors detect subtle cerebral thrombosis lesions for better subsequent treatment and as a reference in AI healthcare development for regional hospitals in Taiwan.

#### INDUSTRY

AI in Healthcare

#### CHALLENGES

- Al Training System at an Affordable Price
- Fast System Response

## Challenges

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## SOLUTION

Supermicro AS -5014A-TT Workstation

#### AS -5014A-TT

- AMD Ryzen<sup>™</sup> Threadripper<sup>™</sup> PRO 3995WX processor (64 cores, 128 threads)2X AMD Radeon<sup>™</sup> PRO W6800 graphics card<u>s</u>
- Max memory Capacity 2TB

Shuang-Ho Hospital, built and operated by Taipei Medical University, is the first Build-Operate-Transfer hospital in Taiwan. The hospital is committed to providing patientcentered medical services and has become an indispensable regional hospital in the densely populated Zhonghe and Yonghe Districts of New Taipei City. The hospital always adheres to its five main principles, "service, teaching, research, community, and quality." It has been gradually accomplishing its goals in phases to build a comprehensive medical service and provide better service quality. Additionally, in cooperation with the government and the university to promote international medical policies, Shuang-Ho Hospital actively presses various international medical services ahead in terms of education and training, research and development, etc. Furthermore, such actions enhance the training of the hospital staff on the international standardization of procedures and help proactively apply for various international certifications.

As more and more hospitals invest in integrating AI and healthcare, Shuang-Ho Hospital is also getting with the times by setting up an AI team to assist in interpreting medical images with AI. At the early stage of this AI project, consumer graphics cards were chosen to install on desktop computers. Nevertheless, due to the poor performance of the graphics cards and insufficient memory capacity, degrading the resolution of medical images was required; therefore, the overall performance was not good enough. Under such circumstances, procuring a new generation of AI workstations was crucial.

## Solution

"We were unfamiliar with various brands of Information Technology, so we chose to look for a suitable solution at the medical exhibition and found that the super workstation AS-5014A-TT presented by Supermicro was just right to meet our needs," said Dr. Yen-Ting Chen, an attending physician in the Medical Imaging Department at Shuang-Ho Hospital, Ministry of Health and Welfare. "After inviting the manufacturer to the hospital for an in-depth introduction, we learned that the workstation adopts such components as AMD Ryzen<sup>™</sup> Threadripper<sup>™</sup> PRO 3995WX processor, AMD Radeon<sup>™</sup> PRO W6800 graphics card, Micron ECC server memory, Micron 7400 PRO enterprise SSD, etc., all of which are sufficient to fulfill the requirements for the initial development of AI medical care. Furthermore, during the joint discussion, the Supermicro, Micron, and AMD teams provided the prototypes supporting AI medical technology for testing. The test results exceeded our expectations, and we finally decided to adopt this solution."

Shuang-Ho Hospital selected the Supermicro AS-5014A-TT workstation due to its excellent performance, high scalability, and high reliability. Since its launch, this Supermicro workstation has received critical acclaim from users worldwide. This product uses a 64-core and 128-thread AMD Ryzen™ Threadripper™ PRO 3995WX processor and can be scaled up to four PCIe 4.0 dual-slot width graphics cards, offering powerful graphics computing capacity. Moreover, the product also features a server-class BMC management chip, supports CPU air/water cooling, and is specially equipped with a quiet fan to ensure stable operation.

One of the main features of the AMD Ryzen<sup>™</sup> Threadripper<sup>™</sup> PRO 3995WX processor is that it has 64 cores and 128 threads and supports 128 PCIe 4.0 lanes, able to meet the needs of large-scale GPU and NVMe SSDs, improving the speed of computer simulation and shortening the simulation time for AI projects. The processor is built with a high capacity of 288 MB of cache for fast access to large datasets. At the same time, the 8channel DDR4 supports ECC specifications to ensure the reliable transmission of mass data. Furthermore, the Supermicro AS-5014A-TT workstation is equipped with two AMD Radeon PRO W6800 workstation graphics cards, helping to process larger datasets and significantly shorten rendering time. Still, it can also accelerate highly complex models and simulations by incorporating the groundbreaking 7nm RDNA<sup>™</sup> 2 architecture.

"When looking for the right AI workstation, our first selection criterion was to find a multi-core processor that could be used with multiple GPU cards in a single server for large amounts of medical image analyses." Yen-Ting Chen further explained, "After we contacted the team jointly formed by Micron, Supermicro, and AMD, they started with understanding our actual needs and future plans and recommended the Supermicro AS-5014A-TT workstation, proving to meet the requirements of the AI project at the POC stage. The price was very reasonable, so it naturally became our best choice."

The Supermicro AS-5014A-TT workstation features Micron ECC UDIMM memory and Micron 7400 PRO 1.92TB enterprise SSD exclusively designed for workstations and servers, offering a variety of capacities and configurations to meet the needs of diverse enterprises. At the same time, the requirements for cost and computing are also taken into account. According to the predictions at Micron's investors' conference, AI training workloads will significantly drive the demand for memory and SSD by approximately six times and two times compared to that of traditional cloud servers, demonstrating the importance of outstanding memory and SSD in this partnership.

The Micron 7400 PRO is designed for servers with power loss protection. It is available in various capacities ranging from 400GB to 7.68TB to meet the diverse needs of high-capacity storage and data analysis applications. The Micron 7400 PRO also complies with the most advanced security standards in the industry, such as TCG-OPAL 2.01 and IEEE-1667, to protect patients' privacy from breaches. In addition, it features various form factors, including M.2, E1.S, and U.3, and delivers read speed up to 6,600MB/s and superior IOPS performance to fulfill the requirements of AI deployment for different scales and from edge to workstation and finally to the data center.

With the AMD Ryzen Threadripper PRO 3995WX processors, Micron's premium memory products can satisfy the throughput of a large number of cores and provide the data required for AI training with ECC memory featuring industry-leading high-speed and large capacity. In addition, Micron offers specialty products with high stability and reliability in memory, SSDs, etc. From wafer and packaging to memory modules, every part of the process undergoes rigorous testing and validation and is further provided with a variety of memory modules required for workstations and servers, such as ECC, Registered, Load-Reduced, etc., with high quality and efficiency to meet the needs of customers today and in the future. Furthermore, Micron's continuous efforts in the Taiwan market have been instrumental in consolidating its leading position in the DRAM field and led to the successful establishment of Micron's DRAM Center of Excellence.

#### AMD

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#### BENEFITS

- Faster and More Complete AI Workloads
- Low Cost and Able to be Easily Replicated



Front and Rear View of Supermicro AS05914TT Workstation

#### **Benefits**

Chia-Chuan Liu, a medical physicist in the Department of Radiology at Shuang-Ho Hospital of the Ministry of Health and Welfare, pointed out that although this was the first time the hospital came across this AI workstation, the AMD Radeon PRO W6000 series workstation graphics cards have already been supporting the mainstream AI frameworks in the market. So, when we conduct AI algorithm training, it is consistently much better than the consumer GPU cards used in the past. Moreover, when it comes to price, computing performance, and other overall indicators, it is a very cost-effective AI workstation that allows us to invest in the AI medical field with a limited budget.

Yen-Ting Chen had previously stated that they were forced to degrade the resolution of brain tomography images due to the lack of computing power when they conducted AI module training. The results were of little help to physicians in practice. Now, with the help of the AS-5014A-TT workstation, medical images can be analyzed in their original resolution, and the results of AI examination are much better than before, which can be of great help to doctors in clinical surgery.

Since the AI project has presented promising results in interpreting cerebral thrombosis images, Shuang-Ho Hospital will continue to promote the optimization of AI modules in the future. In the meantime, the hospital will also share the relevant experience with other departments to fully use AI healthcare to create better medical quality for patients.

For more information, please visit:

https://www.supermicro.com/en/products/superworkstation

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