

Press Release

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World-Leading, Innovative A Novel Non-Invasive Risk Assessment Device for Rapid Screening of Stroke

Sponsored by the Ministry of Science and Technology (MOST) in Taiwan, the Advanced Medical Device Lab (AMDL), led by Professor Hao-Ming Hsiao at National Taiwan University (NTU), has successfully developed the world-first rapid screening device for the risk assessment of stroke using motion analysis, image decomposition and reconstruction, feature extraction, and AI algorithm. This product is quick, accurate, inexpensive and can be done anywhere, anytime, without experienced operators. In less than five minutes, the user receives an evaluation report for stroke assessments including carotid artery stenosis and arrhythmia information. This product allows general public to first assess their own stroke risk at home (or local communities) and then go to hospital for further diagnosis or treatments, if necessary.

World-Frist Rapid Screening Device for Stroke

Professor Hao-Ming Hsiao at National Taiwan University (NTU) has successfully developed the world-first rapid screening device for the stroke risk assessment. Carotid artery stenosis is a leading indicator for stroke. Its degree of narrowing changes the hemodynamics of the blood flow, which reflects on the pulses of the body surface. This product is a revolutionary digital healthcare technology using motion analysis to extract invisible but useful information from our pulses for quantification of risk assessments. The entire process is completed by taking a short video clip aimed at the neck with only one simple click, anywhere, anytime. The video clip is automatically transmitted to cloud for computation and analysis. In less than five minutes, the user receives an evaluation report indicating low to high risk for stroke assessments (carotid artery stenosis and arrhythmia combined). This

product allows general public to assess their own stroke risk at home and take necessary actions as early as possible.

First-Line Screening Prior to Carotid Ultrasound

One of the current clinical gold standards for stroke diagnosis is carotid ultrasound. However, it relies heavily on medical professionals to perform diagnosis and interpret results, which could put constraints on medical resources. Professor Hsiao's team has collaborated with Professor Hsien-Li Kao from the Cardiovascular Center, National Taiwan University Hospital (NTUH) for years. Over the past five years, more than 500 clinical cases have been recruited and tested for comparison. The accuracy of this product stands higher than 90% when compared to the carotid ultrasound data. This product is quick, accurate, inexpensive and can be done anywhere, anytime, without experienced operators. In the future, it could serve as the first-line screening tool prior to carotid ultrasound at hospital or for personal assessment at home or local communities. The potential indications of this technology can be further extended to various types of disease such as arrhythmia, arteriovenous fistula, Parkinson disease, peripheral artery disease.

Future Tech Award, National Innovation Awards, and IDA Silver Award

The mission of Professor Hsiao's lab is to develop novel technologies to help reshape the future medical industry, with the goals of translating the research work into clinical solutions and commercial products. Since 2014, significant efforts have been dedicated by Professor Hsiao's lab on this novel imaging technology for rapid screening. This technology received Taiwan patent and U.S. patent in 2016 and 2019, respectively. Sponsored by the "TRUST-U" program of the Ministry of Science and Technology (MOST) in Taiwan, a startup company "Pulxion" was spun off from Professor Hsiao's lab in June 2020 to commercialize this technology into a product. Currently, there have been huge interests drawn from investors and company executives in Taiwan and from the globe.

This technology has also earned many awards, including 2020 Future Tech Award (FUTEX award), 2016 and 2019 National Innovation Awards, with its top honor "Best Industry Benefit Award" in 2016. It also won the Silver award in 2016 International Design Award (IDA) from U.S.

Great Market Potential in Guarding Health for General Public

Stroke is the top leading cause of death or serious long-term disability in the world. Based on statistics, an estimated 14.6 billion TWD each year, is spent on the stroke treatments by the national healthcare. It is estimated by Allied Market Research that the global market of stroke management will amount to 36.76 billion USD in 2023, with the compound annual growth rate (CAGR) of 7.1%. The world health organization (WHO) reported that there are about 17.7 million died each year due to heart diseases, which is 31% of the death toll worldwide.

Available technologies for diagnosing stroke are magnetic resonance angiography (MRA), computed tomography (CT), and carotid ultrasound. MRA and CT are invasive, while carotid ultrasound, though non-invasive, requires a larger-sized facility to accommodate its equipment, not to mention its higher cost and the needs of medical professionals. The rapid screening device for stroke developed by Professor Hsiao serves as a small-sized, and low-cost device for general public to measure at local communities or at home with high accuracy. Compared to the carotid ultrasound, this product can achieve an accuracy of higher than 90%, and capable of effective diagnosis to minimize the stroke risk at much earlier ages.

This product is expected to receive TFDA approval in 2021~2022, benefiting greatly the general public. It is planned to cooperate with major chain pharmacies, clinics, and healthcare centers, putting this product at key locations for providing service to local communities. It is also expected to launch this product to medical institutions, enterprise, insurance companies, etc., and tailor this product to their specific needs. In the future, it is hoped to bring this product to the general public and every household to achieve the dream of “personalized mobile hospital”.

References:

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Media Contact

Hao-Ming (Herbert) Hsiao

Professor

Department of Mechanical engineering

National Taiwan University
Phone : (02) 3366-9429
E-mail : hmhsiao@ntu.edu.tw

Ching Chun Tu
Program Manager
Department of Engineering and Technologies
Ministry of Science and Technology
Phone : (02) 2737 7527
E-mail : cctu@most.gov.tw