International Journal of DEEPTECH IN MEDICAL SCIENCE & TECHNOLOGY

What the Peers Say!

Prof. Dr. Jackrit Suthakorn
Editor-in-Chief, IJDMST | Director, Center for Biomedical and Robotics Technology (BART LAB),
Faculty of Engineering, Mahidol University, Thailand

Dr. Jackrit Suthakorn is a distinguished leader in biomedical engineering and robotics, currently serving as Dean of the Faculty of Engineering at Mahidol University, Thailand in addition he is also the Director of the Center for Biomedical and Robotics Technology (BART LAB), a cutting-edge hub driving translational research in surgical robotics, rehabilitation systems, and healthcare automation. Dr. Jackrit also serves as the Founding Editor-in-Chief of the International Journal of DeepTech in Medical Science and Technology, a platform to present the state of the research in advancing interdisciplinary innovation at the convergence of medical science with engineering. I am deeply honoured to have the opportunity to interview him and gain insights from his remarkable journey.

1. Origin & Vision

RJ: Greetings from IJDMST. It indeed is a pleasure to interact with you on behalf of all the readers. Could you briefly walk us through your journey in biomedical engineering and robotics—what initially sparked your interest, and how has your vision evolved over time?

JS: In 1995, I graduated with a Bachelor's degree in Mechanical Engineering from Mahidol University, Thailand. At that time, robotics research and education had not yet been established in Thailand, and it was my dream to pursue studies in the field of robotics. I was subsequently awarded the Royal Thai Government Scholarship to pursue my Master's and Ph.D. degrees in the United States, with a clear plan to return to Mahidol University as my academic workplace after completing my doctoral studies.

Mahidol University is Thailand's leading medical-oriented university, with a unique structure that includes two separate Faculties of Medicine: Siriraj Hospital and Ramathibodi Hospital. Both are the oldest hospitals and medical schools in Thailand. Aligning my long-standing dream with the university's strong medical focus, I aimed to develop my expertise in engineering disciplines related to medicine and robotics within an institution that shared this vision.

I therefore chose to pursue my Ph.D. at The Johns Hopkins University, a world-leading institution renowned for excellence in healthcare, medical education, biomedical engineering, and medical robotics. After achieving my goal of earning a Ph.D. in Robotics, with experience and knowledge strongly focused on biomedical engineering, I returned to Mahidol University and began my academic career as a faculty member in the Faculty of Engineering.

There, I established Thailand's first Research Hub for Medical Robotics and the country's first Department of Biomedical Engineering in 2004 and 2005, respectively. The Biomedical Engineering program at Mahidol University quickly gained popularity, attracted many top-performing students, and soon achieved the highest national admission scores among all engineering disciplines and institutions in Thailand within a very short period.

2. Bridging Engineering and Medicine

RJ: Your work at the Centre for Biomedical and Robotics Technology (BART LAB) has led to several practical innovations. What, in your view, are the most promising deep technologies reshaping modern medical science?

JS: The key advantage of BART LAB, located at Mahidol University, lies in our access to extensive resources, personnel, and opportunities for real-world medical applications. Accordingly, our primary research direction is to focus exclusively on real clinical problems identified by the medical community. These problems serve as the foundation of our research topics, with the aim of developing practical solutions to genuine medical challenges.

This approach necessitates close collaboration with medical doctors, surgeons, and healthcare professionals, providing abundant opportunities to work directly with real clinical applications, cases, and patients. As most of our collaborators are faculty members from the Faculties of Medicine and recognized experts in their respective fields, strong mutual learning naturally emerges. Robotics, by its nature, is an inherently interdisciplinary field that integrates Mechanical Engineering (design and mechanics), Electrical Engineering (electronics, control, and power), and Computer Science (artificial intelligence and programming). This environment fosters a high level of ambition among all collaborators to pursue truly novel research and deep-technology innovations.

3. AI-Robotics Integration

RJ: How do you see artificial intelligence enhancing robotic solutions in the medical domain? Could you highlight a case where AI played a pivotal role in your recent research or clinical applications?

JS: Artificial Intelligence (AI) has become a major driving force across many domains, including healthcare and medicine. As one of the three core pillars of robotics—alongside Mechanical Engineering (ME) and Electrical Engineering (EE)—AI plays a critical role in the advancement of medical robotics.

For example, in surgical robotics, many complex procedures rely heavily on medical imaging for diagnosis, surgical planning, and intraoperative guidance. AI can significantly enhance image recognition and interpretation, thereby improving surgical precision in tasks such as anatomical localization, image registration, and real-time navigation. These capabilities enable more accurate coordination among the surgical robot, instruments, and surgeon, ultimately leading to safer and more effective surgical outcomes.

4. Translational Impact

RJ: Many research and technologies remain confined to the labs. What have been the key success factors in ensuring that your prototypes transits into field-ready or commercially viable healthcare systems?

JS: The key to successful translational research leading to real products lies in careful planning and a balanced integration of novel scientific research with real-world application needs. However, many critical factors are involved, particularly in medical-related fields. These include regulatory compliance and standards, as well as user acceptance by medical doctors, healthcare professionals, and patients, all of which play essential roles in determining clinical relevance and market adoption.

5. Thailand's Role in Global MedTech

RJ: What are Thailand's unique strengths in becoming a regional or global hub for Deep Tech-enabled healthcare innovation?

JS: Thailand is a medium-sized country with a population of approximately 67 million people. The country also has a strong healthcare policy that ensures broad access to healthcare services, with citizens able to receive treatment through public hospitals nationwide. As a result, Thailand has a large volume of patients and diverse clinical cases, enabling medical professionals to gain extensive experience and develop high levels of expertise in their respective specialties.

Consequently, clinical studies and medical research represent one of Thailand's unique strengths, positioning the country as a potential global hub for clinical research. Furthermore, Thailand's geographic location at the center of Southeast Asia, a region with a combined population of over 660 million, makes it an ideal hub for the dissemination of research outcomes and medical technologies throughout the region.

In addition, Thailand is a world-renowned tourism destination, and its medical tourism industry is well established and highly successful, further strengthening the country's role in global healthcare and medical innovation.

6. Policy for Future-Ready Medical Systems

RJ: In your opinion, how can robotic systems and AI solutions be integrated into national health systems, especially in Thailand?

JS: The integration of Artificial Intelligence (AI) into medicine has already begun within Thailand's healthcare policy framework. In particular, the Thai Food and Drug Administration (Thai FDA) has adopted this technological breakthrough by recently establishing new regulations to facilitate the approval of medical products classified as Software as a Medical Device (SaMD).

Furthermore, policies and regulatory frameworks for medical robotics are currently under development and are expected to be released within the next six months. These forthcoming regulations aim to support and accelerate the adoption of new procedures in areas such as surgery, rehabilitation, and hospital automation.

7. Interdisciplinary Collaboration

RJ: How important is cross-disciplinary collaboration between clinicians, engineers, and data scientists in realizing the full potential of biomedical robotics?

JS: Based on the level of regulatory complexity and approval requirements—which are largely determined by the degree of invasiveness to humans or patients—the deployment of AI and medical robotics can be strategically phased from diagnosis to therapy and surgery.

Clear examples include AI- and large-data–based medical image diagnostics at the initial stage, followed by rehabilitation robotics, and ultimately surgical robotics with advanced AI integration. This stepwise approach helps balance innovation with patient safety and regulatory compliance while enabling progressive clinical adoption.

9. Relevance to DMST's Mission

RJ: What role do you believe journals like DMST can play in accelerating translational research and fostering global dialogue in Deep Tech for medicine?

JS: Of course, DMST can serve as a platform for sharing research on global healthcare challenges, translational research outcomes and experiences, and reports of clinical studies in AI and robotics for medicine, particularly those directed toward medical device development. In addition, DMST can facilitate collaboration among research institutes, clinical partners, and industry stakeholders.

10. Research Areas for next 5 years

RJ: What will be the future research focus of BART LAB under your esteemed and visionary leadership in the next five years?

JS: BART LAB will continue to work closely with medical doctors, surgeons, and healthcare professionals on fundamental research in medical robotics, including surgical applications, rehabilitation, and hospital services and automation. We currently host not only researchers from engineering backgrounds but also medical doctors and healthcare professionals, fostering a truly interdisciplinary research environment.

In parallel, our strategic direction clearly emphasizes translational research toward medical product development, along with studies related to medical device regulation and compliance.

11. Message as Editor in Chief to Researchers

RJ: What message or advice would you like to give to young researchers and potential authors in the International Journal of DMST for contributing research articles in deeptech and medical science integration for transforming patient care and disease diagnostic and treatment?

JS: Based on my more than 20 years of experience, research in medical devices and medical engineering is certainly challenging, but it is achievable when there is an open-minded approach between the medical and engineering communities. Interdisciplinary collaboration is therefore a key element of success.

Resilience, flexibility, and adaptability are essential qualities in this field. Equally important is the ability to listen carefully and consider problems from multiple perspectives in order to identify true pain points and address real-world clinical needs.