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Thailand designs exoskeleton wheelchair to aid mobility

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A wearable robotic device that supports users by combining a wheelchair and exoskeleton into a hybrid system



Thailand's Chulalongkorn University has introduced the Exoskeleton Wheelchair, an innovative robotic suit designed to help people with disabilities stand, walk, and move more independently. The breakthrough was developed by Assoc. Prof. Dr Ronnapee Chaichaowarat from the Faculty of Engineering, aiming to improve mobility beyond traditional wheelchairs.

Nicknamed Thai Iron Man, this innovation is the first exoskeleton wheelchair built by Thai researchers. Unlike conventional wheelchairs, it can transform to help users stand and walk, making it easier to navigate stairs or public transport. The project received funding from Thailand's National Research Council (NRCT) in 2021–2022 and was a finalist in the 2024 Young Technologists Award.

The Exoskeleton Wheelchair is a wearable robotic device that supports users by combining a wheelchair and exoskeleton into a hybrid system. Made with lightweight carbon fiber, and equipped with foldable wheels, the robot allows users to switch between sitting and walking modes with ease. A motorised system controls hip and knee joints, while the ankle joint remains flexible to ensure natural motion.

The prototype cost 130,000 baht and was funded by research grants. However, Assoc. Prof. Dr Ronnapee believes Thailand's aging population will drive demand for wearable robots. The team is currently developing a second prototype with improved stability for standing and walking. Clinical trials with patients are planned, based on Research Ethics Committee approval. If successful, this Thai-made exoskeleton wheelchair could revolutionise mobility assistance and position Thailand among global leaders in robotics.