Comfort-Centered Design of Lightweight Hip Exoskeleton with Real-Time Machine Learning Capability

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Hip-assistance exoskeletons have shown the potential to improve human mobility, but they are still preventing their widespread adoption. Comfort is a current challenge: unattractive, cumbersome wearable robots will not make an impact. This includes excessive human-exoskeleton interaction forces leading to undesired movements (wobbling) and likely hindering their assistive benefits. In this talk, we introduce our comfort-centered mechatronic design for portable hip exoskeletons, which significantly improves comfort: the exoskeleton, with neural network capabilities, reduced wobbling by 68%, while the metabolic cost of walking was reduced by 20% and got an excellent System Usability Scale (SUS) score of 77.

Video link: https://youtu.be/6X-qzr_diEA