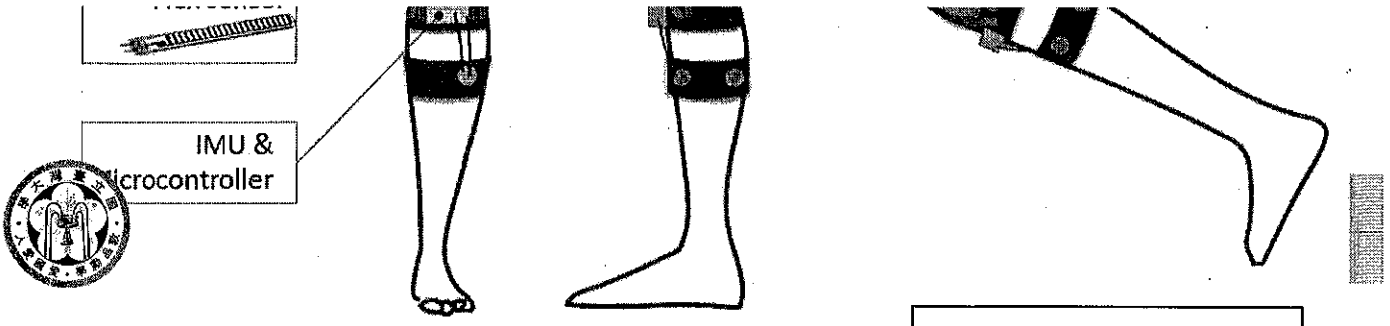

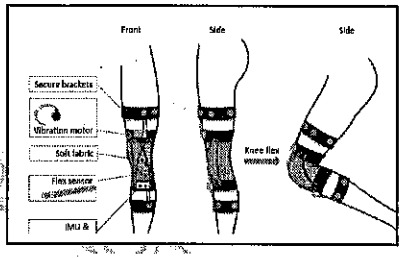

提案人：徐瑋勵教授

單　位： 國立臺灣大學 物理治療學系暨研究所

簡　歷：(可列出相關連結，例如系所、研究室網頁)

徐瑋勵教授為國立臺灣大學物理治療學系教授，研究專長涵蓋脊椎退化性關節的復健訓練與輔具研發。徐教授的研究成果包括與工業技術研究院合作開發復健用外骨骼機器人，以及與中科院合作開發軍用搬運砲彈外骨骼機器人。其團隊的研究多次發表於復健及生物力學領域的頂尖期刊，並獲得多項國內外獎項，如「科技部吳大猷先生紀念獎」、「科技部優秀年輕學者研究獎勵」及「國衛院年輕學者研究獎勵」。**相關連結：** 徐瑋勵教授研究室

市場及需求: 退化性膝關節炎為年長者常見關節疾病，然而市面上尚無提供日常用震動治療與關節角度變化評估的穿戴裝置，這導致患者需頻繁前往醫院進行高頻率的治療，對行動不便者造成不便；若能有居家使用的護膝穿戴裝置，將能提升患者在家進行運動訓練的意願與頻率，從而提供更有效率的治療方式。

技術摘要(含成果): 本技術結合數個慣性感測元件來測量膝關節的角度，並使用震動馬達調節頻率與震幅，以便進行有效的治療評估。此外，透過機器學習技術，該系統能識別使用者的姿態並預測膝關節的動作，進一步提高治療成效的精確度。

優勢: 現有市場上的產品大多只能提供震動治療（如震動筋膜槍）或關節角度測量，但尚無將這兩項功能整合且結合機器學習進行智慧醫療解決方案的產品。本技術創新之處在於整合了關節角度的監測與震動刺激功能，並加入機器學習技術，以提供更加精確的治療效果評估。

競爭產品:無

專利現況:

本研究團隊皆具有生醫背景，且提案人有多項與動作感測相關專利。

聯絡方式(請不用填):

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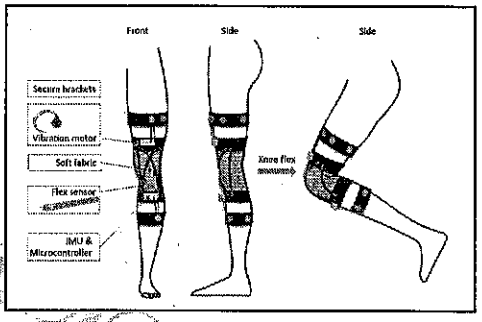
Smart Knee Brace for Joint Motion Assessment and Muscle



PI： Professor Wei-Li Hsu is a professor in the Department of Physical Therapy at National Taiwan University. His research expertise includes rehabilitation training and the development of assistive devices for degenerative spinal joints. Professor Hsu's research achievements include collaborations with the Industrial Technology Research Institute (ITRI) to develop an exoskeleton robot for rehabilitation and with the National Chung-Shan Institute of Science and Technology to develop a military exoskeleton robot for ammunition transportation. His team's research has been widely published in top journals in the fields of rehabilitation and biomechanics. Professor Hsu has received numerous awards, including the "Wu Ta-You Memorial Award" from the Ministry of Science and Technology, the "Outstanding Young Scholar Research Award" from the Ministry of Science and Technology, and the "Young Scholar Research Award" from the National Health Research Institutes.

Related Link: Professor Wei-Li Hsu's Research Lab

Market Needs: Degenerative knee osteoarthritis is a common joint disease among older adults, yet there are no wearable devices on the market that provide daily vibration therapy and evaluate changes in joint angles. This forces patients to frequently visit hospitals for high-frequency treatments, which is inconvenient for those with limited mobility. A wearable knee brace for home use could increase patients' willingness and frequency to exercise at home, thereby providing more efficient treatment.

Our Technology: This technology integrates multiple inertial measurement units to measure knee joint angles and uses vibration motors to adjust frequency and amplitude for effective treatment evaluation. Additionally, through machine learning, the system can recognize the user's posture and predict knee joint movements, further improving the accuracy of treatment assessments.

Strength: Current market products primarily offer vibration therapy (e.g., fascia guns) or joint angle measurement but lack a system that integrates both functions with machine learning for intelligent healthcare solutions. The innovation of this technology lies in its combination of joint angle monitoring and vibration stimulation, with the added use of machine learning to provide more precise treatment evaluations.

Competing Products: NA

Intellectual Properties: The research team has a biomedical background, and the proposer holds multiple patents related to motion detection.

Contact (do not need to fill out):

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