Upper Limb Rehabilitation System Based on Adjustable Resistance of FOC Motor and VR Rhythm Interaction

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Middle-aged and elderly people are prone to frozen shoulder, which causes shoulder pain and restricted arm movement, significantly affecting their daily lives. Doctors usually recommend rehabilitation training, but conventional exercises are repetitive and boring, and it is difficult to ensure standard movements, making it hard for many patients to persist. Therefore, this project designs a rehabilitation training device combining VR immersive experience with rhythm games. The device can accurately measure the user's stretching range and maximum pain-free pulling force. Based on an FOC motor, it provides safe, personalized adjustable resistance, guiding and standardizing the patient's rehabilitation movements through rhythm games. While patients enjoy the immersive game, the system provides real-time feedback on movement status and dynamically adjusts the resistance, ensuring training is completed on time and up to standard, thereby effectively improving rehabilitation outcomes.

Awards Won: