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(57) Abstract :
SENSOR-BASED SMART SHOE SYSTEM FOR MONITORING AND TRAINING WEIGHT-BEARING ASYMMETRY IN POST-STROKE REHABILITATION
A sensor-based smart shoe system for monitoring affected-limb loading during post-stroke rehabilitation is disclosed. The system comprises a footwear or shoe-sole arrangement having at least one force or pressure sensor positioned at a plantar loading region, a programmable controller, signal-conditioning circuitry, and a visual feedback arrangement. The controller processes the sensed affected-limb loading in real time with reference to patient-specific therapeutic loading threshold ranges and classifies the loading into insufficient, intermediate approaching-target, target-range, and excessive or incorrect loading states. Corresponding blue, orange, green, and red visual indications are generated to provide graded feedback of the detected loading condition. The sensor may be calibrated against known reference loads, and the therapeutic thresholds may be programmed as a proportion of patient body weight. An optional data-storage and analysis module may record rehabilitation-session information for subsequent review and progress analysis. [FIG. 1]

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