



Envisioning a Camera-Based Future for Remote Physical Therapy: A Technical Feasibility and Design Analysis

Muskaan Jain

San Francisco State University, California

Abstract:

The expansion of telehealth necessitates robust solutions for monitoring patient adherence and movement quality in remote rehabilitation settings. This paper explores the feasibility of implementing non-invasive, camera-based computer vision systems as a core component of tele-physiotherapy platforms. We present a comparative analysis of existing monitoring technologies, arguing that vision-based systems offer unique advantages for direct, non-intrusive assessment of therapeutic exercises by replicating the clinician's visual perspective. A proof-of-concept application for automated fall detection is detailed to demonstrate current technical capabilities. The discussion extends to critical design considerations for clinical deployment, including environmental setup, lighting, user training, and data integration for automated quality assessment. We conclude that while significant technical and practical hurdles remain, computer vision represents a promising pathway to enhance the fidelity, safety, and accessibility of remote physical therapy services.

Keywords:

Tele-physiotherapy, Computer Vision, Remote Monitoring, Fall Detection, Rehabilitation Technology, Camera-Based Systems.