

Re-SWOLE

Nathaniel Agharese
Alex Gruebele
Camille Townshend

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Design and Control
of Haptic Systems

Rehabilitation Skin-stretch Wearable Operating on Lower Extremity

To recover from physical injury, a consistent rehabilitation exercise regime is necessary. Physical therapists are crucial in formulating specific exercise routines for patients. In addition to sessions with physical therapists, patients often do many of the exercises on their own time. Rehabilitation exercises often require precise movements to function as intended, and without the live guidance of a therapist, form can suffer. **Our goal is to use skin-stretch and vibration haptic feedback to guide rehabilitation form in patients with knee injuries, to improve recovery outcome.**

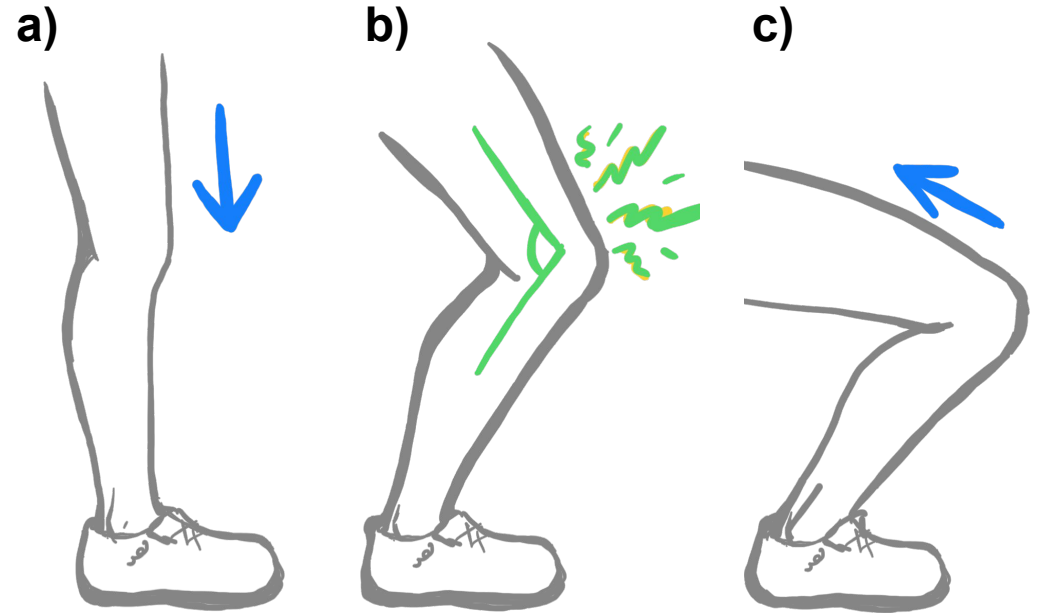


Figure: a) Beginning b) End of intended motion c) Overshooting

Skin-stretch (in **blue**) is used to guide the user's knee angle throughout a squat. At the beginning of the squat, (**figure: a**) when the knee is extended, the user feels a downward pull on their skin, urging them to bend their knee and initiate a squat. If the user overshoots the final optimal knee angle (**figure: c**), the user feels an upward pull on their skin. This urges them to extend their knee and move upward intuitively following the stretch direction. Also, the extra stretch provided by our device simulates the proprioceptive feedback for a deeper squat. Finally, vibration feedback (in **green**) is used to cue the user when they have reached the full range of intended motion (**figure: b**).