



H-Man: A Novel, Portable & Inexpensive Planar Robot for Arm Rehabilitation after Stroke

Project Motivation & Objectives

The primary objective of the project is to investigate, design and develop a low cost solution for neuro-rehabilitation of sensorimotor functions. The project aims to assess whether H-Man can be used (semi-) autonomously in decentralised environments such as small community centres and homes where specialised care is not readily available.

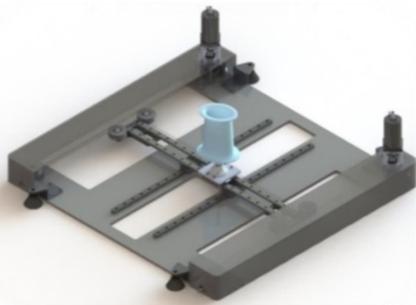


Fig 1: A stroke participant using H-Man (left) and model of first H-Man prototype (right).

Overview

H-Man is a compact planar robot that can provide forces of up to 30 N at the end-effector (handle) in any specified direction within its workspace to assist or resist the motion of the user. Furthermore with integrated sensors, it offers the possibility to continuously assess performance during regular robotic therapy.

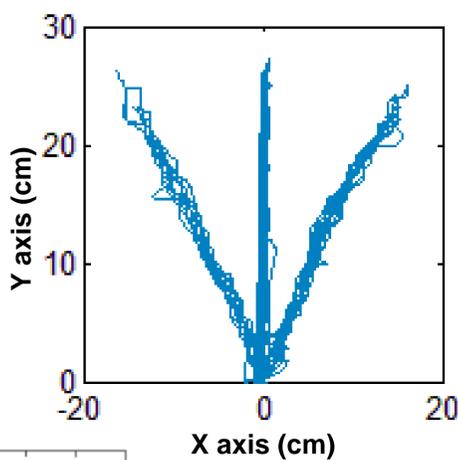
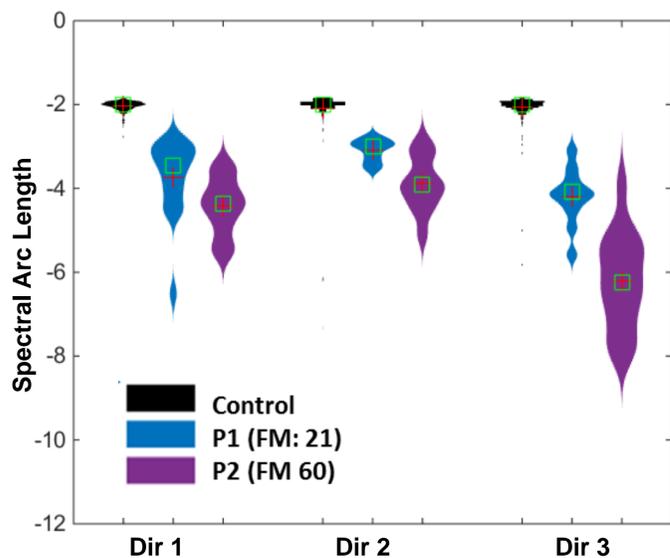


Fig 2: Reaching trajectories of 1 stroke participant (right). Comparison between smoothness of control between two stroke participants (below). Higher values indicate smoother movement.



Future Plans

Currently, the efficacy of H-Man as a neuro-rehabilitation tool is being validated. It is expected that stroke patients will exhibit a significant decrease of impairment when training with the H-Man. Furthermore, researchers aim to develop multiple different therapeutic regimes to help decrease the work load of therapists and increase the amount of training for patients.



Fig 3: H-Man version 2, design in progress

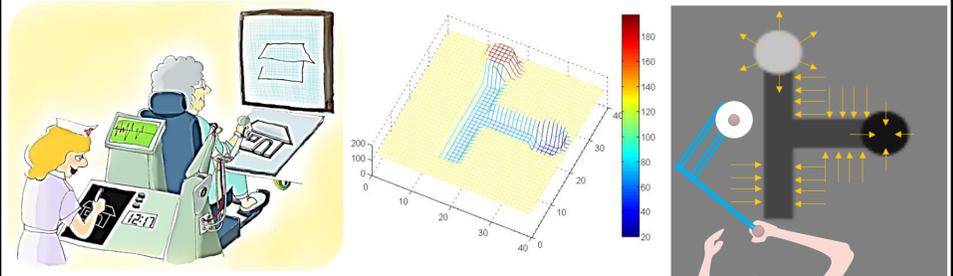
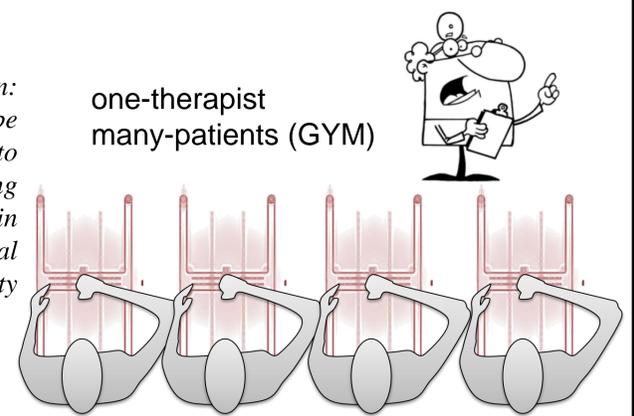


Fig 4: Painting the force fields (see ref.). Designing therapist friendly approach for implementing force fields on H-Man.

Advantage of H-Man: Multiple stations can be deployed in hospitals due to its low-cost, thus allowing patients to train independently with minimal supervision in community centres.

one-therapist many-patients (GYM)



References

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