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**AI’s Role in the Modern World-**

**F.A.I.R. Chance©**

**Fine motor Artificial Intelligence-assisted Rehabilitation Chance**

**Problem-** As I continue to recover from paralysis, I aim to address the *social problem* of rehabilitation of individuals with *fine motor disability*.

While restoring gross motor functions is important, these patients often *struggle to perform activities of daily living* like, picking up objects, buttoning clothes, or eating, which require fine motor control.

Lack of fine motor control is a *major barrier to social integration and independence* of such individuals.

The recovery of fine motor skills requires intensive and consistent occupational therapy. However, these sessions are typically time limited and require constant supervision and subjective feedback by *occupational therapists*.

Drawing from *my own experience of recovering from paralysis*, I believe an AI-powered solution can be used to track fine motor movements of patients and give *objective feedback for monitoring progress* by occupational therapists and provide *reinforcement to the patient* to work towards a specific goal.

**Solution-** F.A.I.R. Chance© is a computer vision (A.I.) application which can *detect, track, extract data related to range and speed* of the patient’s fine motor movements, estimate their movements, and appropriately provide feedback to the patient, all in real-time (or offline), through a single camera. This application is able to precisely classify and locate *21 hand-knuckle joints*. It is able to correctly measure the coordinates of joints [in 3D space (X, Y, Z)], and the angle made by a joint, relative to the 2 joints adjacent to it. It can also detect the speed of these movements. The application is capable of comprehending change in orientation of the hand(s), extension-flexion at joints, adduction-abduction of fingers, opposition of thumb(s) etc. and adapting its measurements accordingly.

Thus, based upon such measurements, it is able to estimate the overall movement with high accuracy, subsequently providing them feedback about how well the target movement is being achieved. The advantage of the application is that it will be able to run with a single camera input, and does not require a stereo-vision input.

**Conclusion-** This application provides *a quantitative and tangible feedback* on the improvement in patient’s fine motor movements, thus giving them reinforcement and motivation to complete their rehabilitation therapy. The data thus generated can be utilised by the patient’s occupational therapist for further analysis, who will then be able to provide more goal-oriented input regarding the exercise protocols. Overall, this application will act as a catalyst in the patient’s rehabilitation journey, hence *aiding their social integration*.

**[Here is a link to a video demo of my application tracking key hand/finger movements.](https://youtu.be/0IOledubKY4)**

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