Motion Capture Research

## FreeMoCap – freemocap.org

FreeMoCap, or The Free Motion Capture Project is an open-source project that aims to provide research-grade markerless motion capture software to everyone for free. Built using a user-friendly framework to achieve the goal of creating a system that serves the needs of professionals while remaining intuitive to a child with no technical training or outside assistance.

## Rokoko Studio

Rokoko Studio is a versatile mocap software that works both using a proprietary Smartsuit as well as basic tracking with iOS devices. This software is very beginner friendly and accessible for basic motion capture, however it is limited on its free plan. The limited plan also limits length of video to just 15 seconds

## DeepMotion Animate 3D (Free and Paid Options)

Animate 3D by DeepMotion is a cloud-based AI motion capture solution that turns video footage into 3D animations. No hardware needed, only an internet connection and a video clip. It is very easy to use, upload video, and get 3D motion data output. It’s highly accessible, as you don’t need special hardware. Results can be exported to FBX for use in VR engines. Free version limits the length of animation, and the processing is cloud-based so requires internet and has some delay. Paid plans for higher quality and longer animations.

## Kinect-based Solutions (Kinect v2 or Azure Kinect)

Useful if you have a Kinect sensor, software like **iPi Soft** (which has a trial) or **Brekel** offers robust full-body tracking with these older devices. Requires some setup but is straightforward once you have Kinect installed and set up. Kinect offers decent full-body tracking at a low cost, making it a good choice for VR. The community provides support and advice for optimizing results. Limited accuracy compared to higher-end systems, though adequate for simple projects.

## Comparison

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| **Feature** | **FreeMoCap** | **Rokoko Studio** | **DeepMotion Animate** | **Kinect-Based** |
| **Cost** | Free | Free - $50/m | Free - $83/m | Trial |
| **Hardware Needed** | Cameras | iPhone/Smartsuit | Video | Kinect |
| **Ease of Setup** | Moderate – High | Easy | Easy | Moderate |
| **Accuracy** | Good (camera dependent) | High | Moderate | Moderate-High |
| **Performance** | Not optimized for real-time | Real-time | Post-processing | Real-time |
| **Customization** | High (open-source) | Low | Low | Moderate |

## Conclusion

Based on my own personal research I believe that the best solution for me is FreeMoCap. This is due to its free cost, ease of access in terms of hardware, as well as its open-source nature. While it may not be optimised for real time performance, that is not a feature that I will need.