

# FreeMoCap: Professional 3D Motion Capture Using Only Webcams

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The image is a promotional graphic for FreeMoCap. It features a dark blue background with a grid pattern. The title 'FreeMoCap: Professional 3D Motion Capture Using Only Webcams' is prominently displayed in white and light blue. Below the title, it says 'Open-source markerless tracking for everyone'. Three key features are highlighted in separate boxes: '\$0 vs \$10k-\$500k for commercial motion capture', '553 Body, hand, and face landmarks tracked per frame', and 'CPU No GPU required, runs on any laptop'. The date 'May 28, 2026' is at the bottom left, and 'ToKnow.ai' is at the bottom right. A small diagram of a person's head and neck with tracking points is visible in the upper right corner.

## FreeMoCap: Professional 3D Motion Capture Using Only Webcams

Open-source markerless tracking for everyone

- \$0**  
vs \$10k-\$500k for commercial motion capture
- 553**  
Body, hand, and face landmarks tracked per frame
- CPU**  
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[FreeMoCap](#) is an open-source system that turns ordinary webcams into a research-grade markerless motion capture rig. Point two or more cameras at a scene, wave a printed calibration board, and the software uses [Google MediaPipe](#) to track 553 landmarks per frame: 33 body joints, 42 hand points, and 478 facial features. Multi-camera triangulation converts those 2D

detections into full 3D coordinates. [Version 1.8.2](#) (April 2026) adds reprojection outlier rejection, solving a problem where one bad camera angle could corrupt the entire reconstruction by identifying and dropping bad views on a per-point basis. Outputs include CSV for analysis, FBX for game engines, and native Blender files. It runs on CPU, installs via `pip install freemocap`, and processes everything locally.

Professional motion capture from Vicon or OptiTrack costs \$10,000 to over \$500,000. FreeMoCap does the same fundamental job with hardware people already own. An indie game developer can animate characters from their living room. A biomechanics researcher without a lab budget can collect publication-quality gait data with two USB cameras. A physical therapist can record patient movement for remote analysis. All processing stays on-device, so sensitive footage never leaves the machine. The project is partially [funded by the NIH](#).

The pattern holds across computer vision: expensive specialized hardware gives way to software on consumer devices. Webcams replacing motion capture suits follows the same path as smartphones replacing barcode scanners. The bottleneck has shifted from equipment cost to awareness.

Sources:

- [FreeMoCap GitHub Repository](#)
- [FreeMoCap v1.8.2 Release Notes](#)
- [FreeMoCap Official Website](#)
- [FreeMoCap on Zenodo \(DOI: 10.5281/zenodo.7233714\)](#)

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