

AMASS (ADTech Motion Analysis Software System) is a software package for deriving the three-dimensional (3D) locations of passive targets (unidentified markers) imaged by any number of video cameras, and writing the identified data to file using the C3D file format. Input data are the marker centroids expressed in each camera's image coordinate system, and a small number of parameters.

The original AMASS was released in 1988 and presented novel solutions to issues such as camera lens distortions, camera system calibration, image data reduction, and integrated 2D and 3D marker tracking. It also introduced the C3D file format for identified 3D marker data that has become a standard for biomechanical applications, see c3d.org. In 1995 AMASS introduced the first wand calibration that has now become the standard for passive marker systems. Since that time, computer, camera, and software technology has grown at a rapid pace to the point where an inexpensive desktop computer and off-the-shelf cameras can easily collect and process data from many cameras and create extremely large data files.

Unfortunately the ease-of-use of 3D measurement systems has not kept pace with hardware improvements, with the consequence that many commercial systems still have a steep learning curve and often require dedicated professionals for their effective operation. The reason for this is twofold:

1. The systems are inherently complex, involving camera and computer technology, optics, 3D geometry, and individual application requirements, and it is very difficult provide an integrated system that has the intelligence to reduce this complexity down to a point where the system can be easily operated by a novice user.
2. Many currently available software implementations are based on legacy software that is very difficult to modify without starting from scratch. An additional factor is that most modern software techniques (e.g. wand calibrations) are not in the public domain because they have been developed for proprietary use in commercial packages.

This new version of AMASS aims to provide the easiest-to-use software package that is theoretically possible, and much effort has gone into reducing the need for detailed user input, and into guiding the user throughout the process. An equal emphasis has been placed on the accuracy of the camera and system calibrations by use of a new type of wand which ensures optimal accuracy and facilitates reliable 3D reconstruction and tracking of markers. As such, it is expected that the package will find wide applications in research laboratories, clinics, animation studios, and many educational settings.

[AMASS Overview](#)

[AMASS Documentation](#)

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