

## Motion Capture

### Overview

Participants are fitted with small circular markers that are coated to reflect infrared light. Each Qualisys camera emits infrared strobe pulses that capture the marker locations in 2D space. Using multiple cameras and 3D reconstruction algorithms, the system creates and records a model of real movement. For maximum success, each marker must be visible to at least 3 cameras at all times, the capture space should encompass all movement origins, and the cameras should be set up in a manner that compliments the type of movement you wish to observe.

Our staff will assist in reviewing a research design to ensure you get the most out of your LIVELab experience.

All research conducted in the LIVELab is subject to appropriate ethics guidelines and secure data handling procedures.

### Frequently Asked Questions

*What is the limit of the capture space?*

The capture space depends on the camera set up, but can be as large as the entire theatre (2000 sq. ft.).

*What implications are there in marker placement or type of movement observed?*

Markers lose their location validity if attached to loose clothing, and there are some constraints on body parts and movements that can be captured (e.g. rolling on the floor could unfasten markers). Objects that are highly reflective can be difficult to capture and may need to be covered.

*What is the average set-up time?*

Set-up time depends on the research design, but is typically 2-4 hours.

*Can movement act as a real time trigger?*

Yes, a protocol exists for real-time streaming of location data to other technology systems in the LIVELab.



### Technical Specifications and Software Output

- Make/Model: Qualisys Oqus 5+, Oqus 7
- Quantity: 28 infrared cameras, 1 video
- QTM, Visual 3D, 3DSMax software
- Motion Builder, Unity3d plugins
- Resultant files: .tsv, .c3d, .avi, .mat.

### Technical Synchronization

All technologies included in the LIVELab are built to interact with each other.

### Research Examples

- Analyzing dancer movements
- Analyzing musical performances and conductor movements
- Investigating interactions between performers and audience members
- Studying dramatic performance, presentations
- Investigating audience participation/engagement
- Studying clinical movement disorders (e.g., Parkinson's disease, Developmental Coordination Disorder)
- Movement tracking for graphic/game design