



Phoenix Technologies Incorporated

High Performance Real-Time

3D Motion Capture Systems For Professionals

www.ptiphoenix.com

Multimedia Advantages

Fully Automatic Calibration

By using the recently released VZAutoCal™, even a multi-tracker Visualeyez™ system is now fully automatically calibrated. No manual user calibration effort is required at all. Should any tracker gets bumped or moved during a capture, just wait for a second or two, and the system will recover the accurate calibration by itself!



Continuous Adaptive Calibration

VZAutoCal™ will also update the system calibration continuously if the user so chooses. It will make use of the data captured during a session and optimize the system calibration at intervals chosen by the user. The updating can be stopped at any time by the user if desired.

Easy Operation

It's very easy to operate a Visualeyez™ system for most motion capture applications:

1. Turn on the system.
2. Click on 'Auto Configure' (to connect the trackers to the computer).
3. Start 'Auto Detect Targets' (to identify which markers are being used).
4. Set desired capture frame rate and sampling period.
5. Press 'Record' to start motion capture. (The system will calibrate automatically!)

Highly Portable & Easy To Set Up

Lightweight yet rugged design makes a Visualeyez™ system the most portable motion capture system available. A 4-tracker system can be transported or checked in as baggage on flights by two people to anywhere, then set up and start to operate within about 30 minutes!

Scalable To Meet Capture Requirements

The size of a Visualeyez™ system, hence the capture area and complexity, can be easily scaled up or down to fit a specific motion capture application. A 1-tracker system is good enough for capturing 3D facial expressions and any other motions that do not contain much rotation. A 3-tracker system can capture full-body, facial and even finger motions all at the same time! A 4-tracker system is good for capturing any types of motions and multiple actors simultaneously. Even larger system can extend the capture area indefinitely.

Setup In Anyway You Like

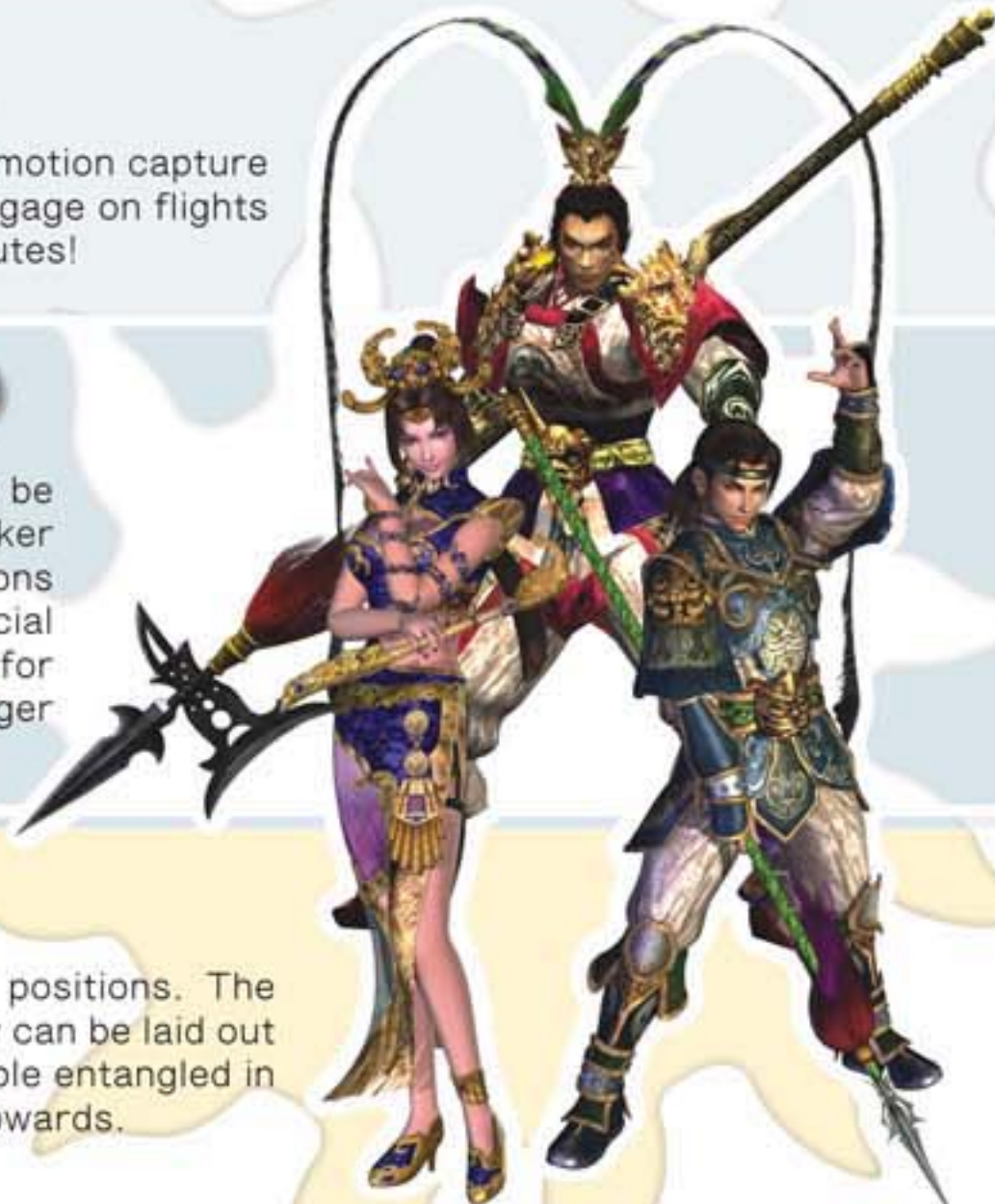
Visualeyez™ systems do not require any illuminators to sense the marker positions. The trackers can face each other without causing any blinding problem. Hence they can be laid out and oriented in any way to capture the desired motions. For example, two people entangled in mid-air may be better captured with some trackers lying on the ground aiming upwards.

Huge Capture Space

Each Visualeyez™ system tracker can capture over a huge 3D space. This is due to its exceedingly wide (90 degrees) sensing angles. A 4-tracker system can be easily setup to yield almost 6m x 6m capture area.

High Accuracy & Resolution

Every individual Visualeyez™ tracker is factory-calibrated by instruments with 3D accuracies traceable to international standards. The resolution is so high that while capturing the full-body motions of a person at a distance, his facial expressions can be captured at the same time.



Dynasty Warriors 3 characters
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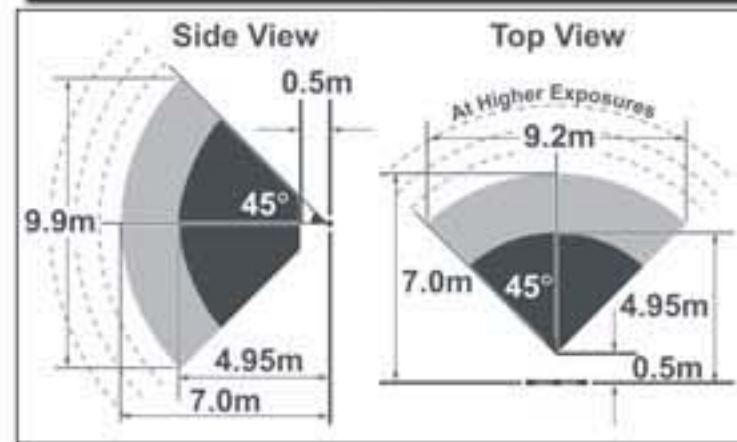
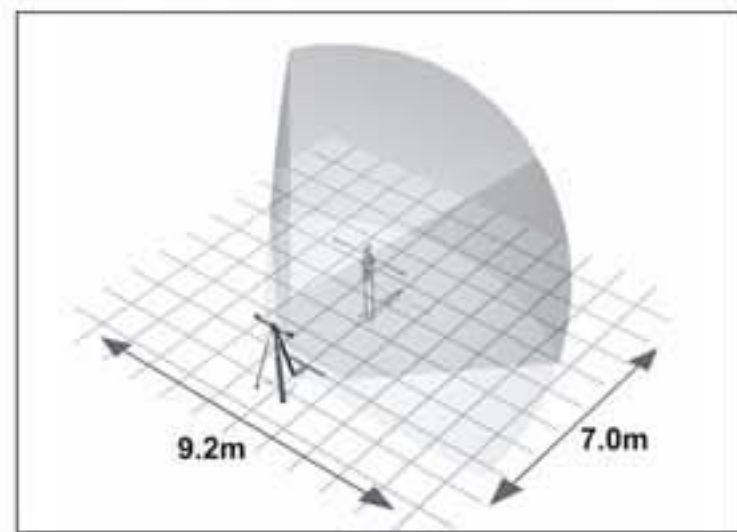
Multimedia Advantages

Reliable Real-Time Operation

Visualeyez™ system can output the captured data within 0.5 milliseconds (< 0.0005s) from the time the marker light reaches the tracker. Since no marker identification problem will ever occur, the user can depend on receiving a correct marker's data within this timing for implementing autonomous real-time applications reliably.

Technical Specifications

Sensing Volume:	~ 190 m ³ of useful space, over 7m radius (at min. exposure)
Minimum Sensing Distance:	0.5 m
Position Resolution:	0.015 mm at 1.2m distance
Number of Markers:	512 max (no 'swapping' problems)
Number of Subjects:	512 maximum
Calibration:	Not required for an individual tracker Not required for multi-tracker systems either, if VZAutoCal™ is applied
Scalability:	Unlimited, 1~24 trackers tested
Accuracy (3D combined, nominal):	<0.5mm rms (H-series) 0.5~0.7mm rms (E-series) Calibration data range: 0.6~2.5m distance, +/-40° yaw, +/- 30° pitch
Operation Angle:	90° (+/- 45°) in both pitch and yaw; 107° diagonally
Sensing Rate:	4348 3D data points per second (single sampling) 4167 3D data points per second (double sampling)
Data Latency:	< 0.0005s at maximum sample rate
Computer Communication:	Serial RS232/RS422 (921.6kbps)
Mounting Orientation:	Any (no 'blinding' problems)
Ruggedness:	Can operate with up to 15G acceleration applied to the tracker (optional)
Tracker Bar Weight:	3 Kg



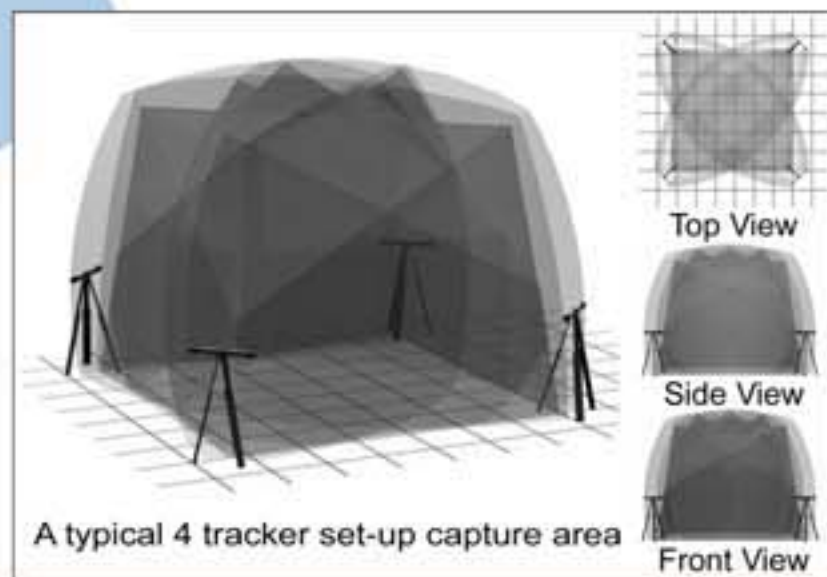
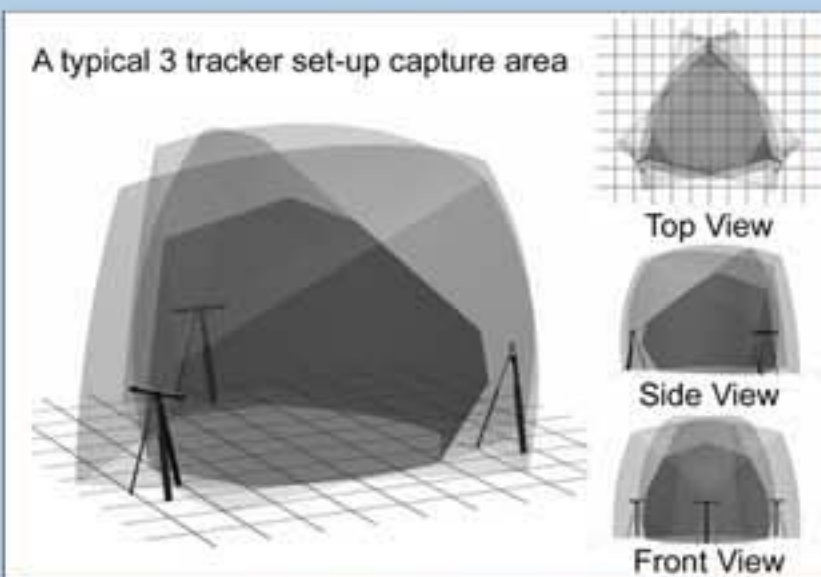
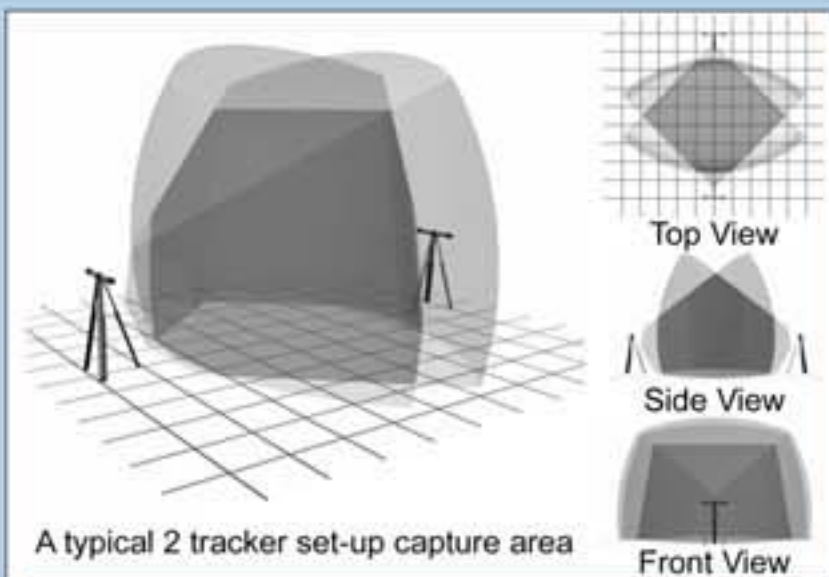
Single Tracker System

Consisting one single tracker, this simplest Visualeyez™ system is good for tracking 3D object motions with little rotational components (which are the main causes of occlusion). Example applications include walk studies, gait analysis, facial motion capture, machine vibration research, 3D digitization, etc.

Multi-Tracker System

For large range and/or complex motions with large rotation components, you may require a multi-tracker system to capture from different directions. An extra software, the VZAutoCal™, is now provided for operating such a system without requiring the user to do any manual calibration. VZAutoCal™ makes the multi-tracker system appear as if it were a more sophisticated single-tracker system. The advantages of a multi-tracker system include:

- Increased capture space
- Multi-directional capture of the markers to reduce occlusion and improve data quality
- Flexible capture space design as only one tracker needs to sense a marker to determine its 3D position



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