

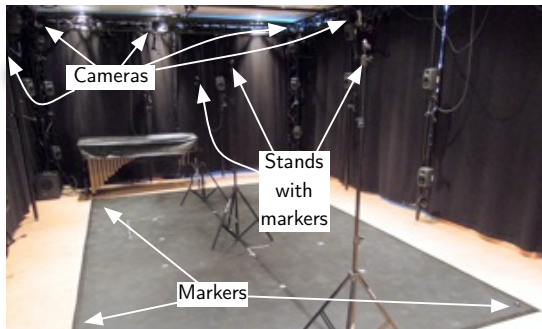
A Study of the Noise-Level in Two Infrared Marker-Based Motion Capture Systems

Alexander Refsum Jensenius, Kristian Nymoen, Ståle A. Skogstad, Arve Voldsund
University of Oslo, Department of Musicology & Informatics, fourMs lab

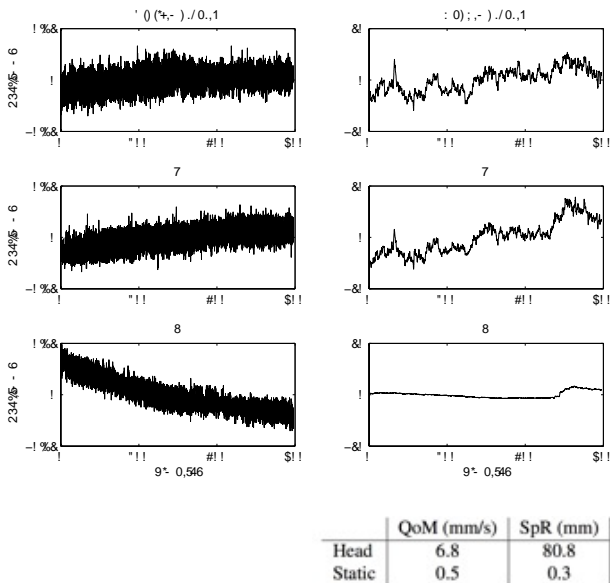
Abstract

With musical applications in mind, this paper reports on the level of noise observed in two commercial infrared marker-based motion capture systems: one high-end (Qualisys) and one affordable (OptiTrack). We have tested how various features (calibration volume, marker size, sampling frequency, etc.) influence the noise level of markers lying still, and fixed to subjects standing still. The conclusion is that the motion observed in humans standing still is usually considerably higher than the noise level of the systems. Dependent on the system and its calibration, however, the signal-to-noise-ratio may in some cases be problematic.

Setup



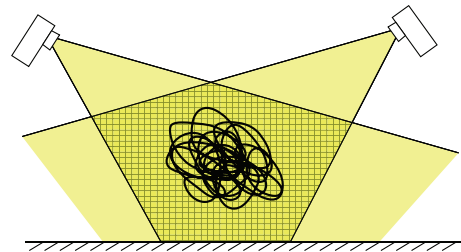
Static vs. human noise



Sampling frequency

SR (Hz)	QoM (mm/s)	SpR (mm)
500	0.43	0.11
200	0.30	0.08
100	0.32	0.11
50	0.29	0.07
20	0.33	0.10

Calibration volume



	QoM (mm/s)	SpR (mm)
inside	1.5	0.1
hole	2.7	0.4
outside	10.5	0.9

Other factors

- marker size
- lighting
- occlusion

Qualisys vs. OptiTrack

	OptiTrack		Qualisys	
	QoM (mm/s)	SpR (mm)	QoM (mm/s)	SpR (mm)
Floor	12.5	3.8	3.2	0.68
Stand	7.8	3.9	3.6	0.57

