motion capture
in
music analysis and performance

Alexander Refsum Jensenius
fourMs labs, Dept. Musicology, University of Oslo
09:30-10:15. Lecture: MoCap in music
10:15-10:30. Demo: Musical Gestures Toolbox
10:30-11:00. Demo: Xsens
11:00-12:00. Workshop: misc. controllers
motion capture
optical infrared marker-based motion capture
optical  marker-based motion capture
motion capture
infrared
optical

optical infrared
motion capture
inertial sensor-based motion capture
sensor-based motion capture

mechanical
electromagnetic sensor-based motion capture
physiological sensor-based motion capture
Electromagnetic
Optical (infrared)
Inertial
Optical (visual)
Mechanical
Physiological

Motion capture
<table>
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<tr>
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<th>Inertial/magnetic</th>
<th>Mechanical</th>
<th>Electro-magnetic</th>
<th>Optical (visual)</th>
<th>Optical (infrared)</th>
<th>Physiological</th>
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<td><strong>+</strong></td>
<td>- flexible</td>
<td>- flexible</td>
<td>- resolution</td>
<td>- flexible</td>
<td>- speed</td>
<td>- indirect motion sensing</td>
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<td></td>
<td>- small</td>
<td>- small</td>
<td>- identification</td>
<td>- no cables</td>
<td>- resolution</td>
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<td></td>
<td>- absolute</td>
<td>- no markers</td>
<td>- # markers</td>
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<td>- accessible</td>
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<td><strong>-</strong></td>
<td>- relative</td>
<td>- relative</td>
<td>- cable</td>
<td>- 2D</td>
<td>- markers</td>
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<td>- short range</td>
<td>- speed</td>
<td>- calibration</td>
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<td>- resolution</td>
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motion capture in music analysis and performance
practical challenges

conceptual challenges
practical challenges

setup
calibration
streaming
recording
storing
analysing
mapping
setup
calibration
streaming
recording
storing
analysing
mapping
Jensenius, Kvifte, Godøy: Towards a gesture description interchange format. NIME 2006

Pre-process → Feature extraction → Realtime synthesis

G/SDIF storage

GDIF OSC
motion \rightarrow \text{mapping} \rightarrow \text{sound}
conceptual challenges
motion? action? gesture? sound
functional relationships
sound-producing: modification
excitation

communicative: performer-performer

ancillary:
phrasing
support
entrained

Sound-accompanying mimicking, sound-tracing, emotive, dance, ...

performer-perceiver
action-sound relationships
Semantic mapping
examples
simple motion capture
Laser dance (2001)
performing in the air
Dance Jockey (2010)
musician =? dancer
motion capture instrument?
micromovements