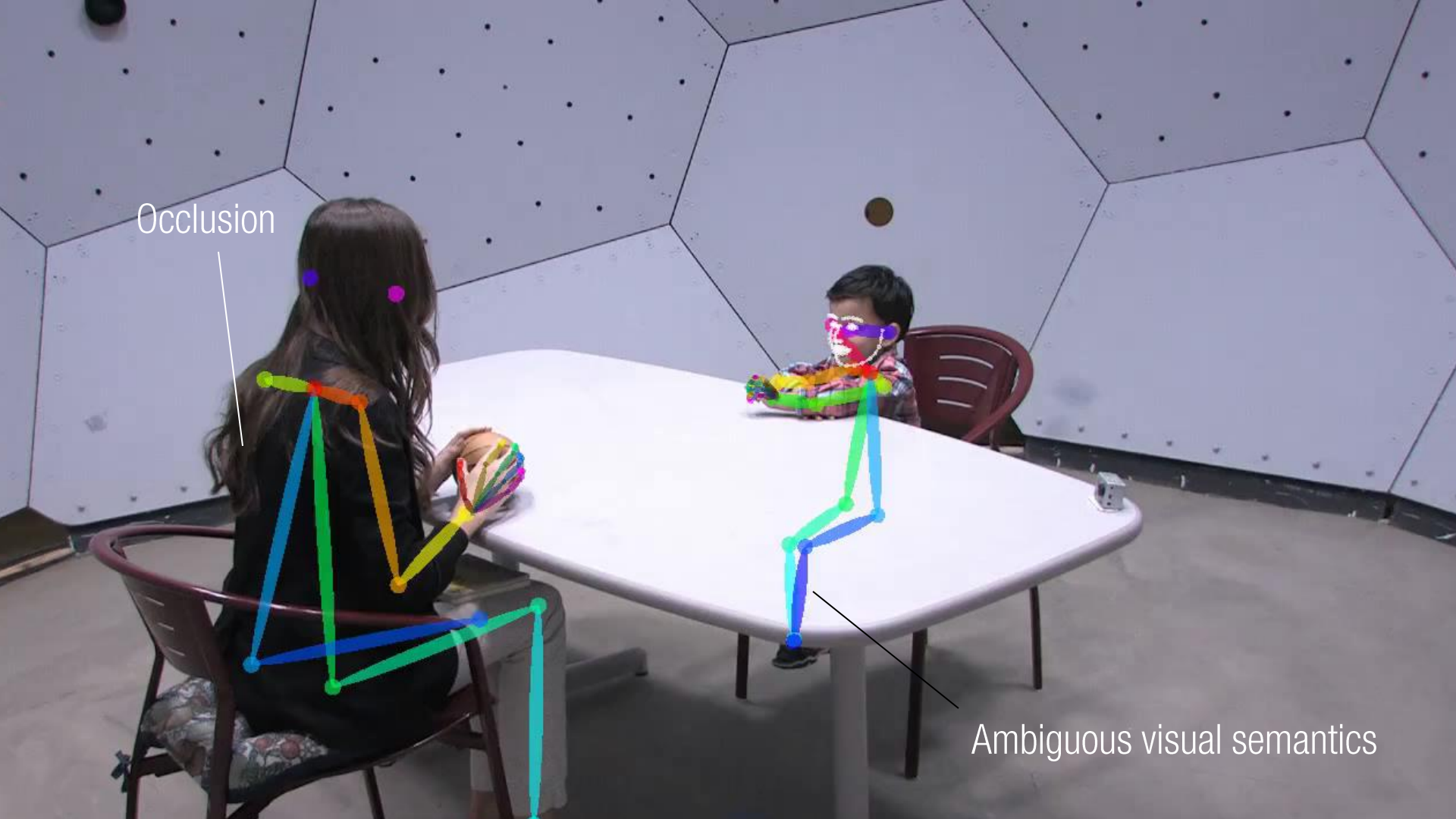
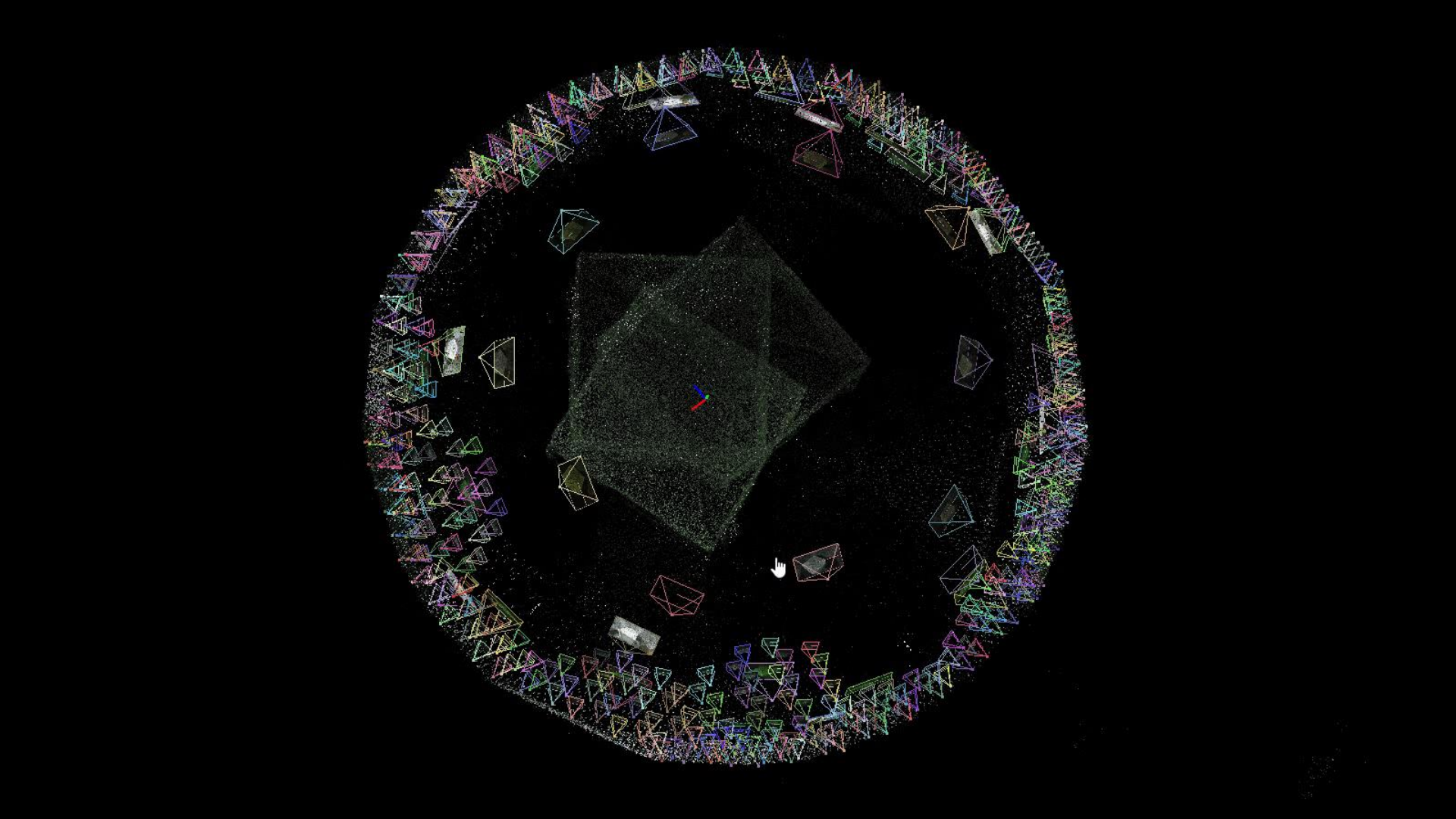
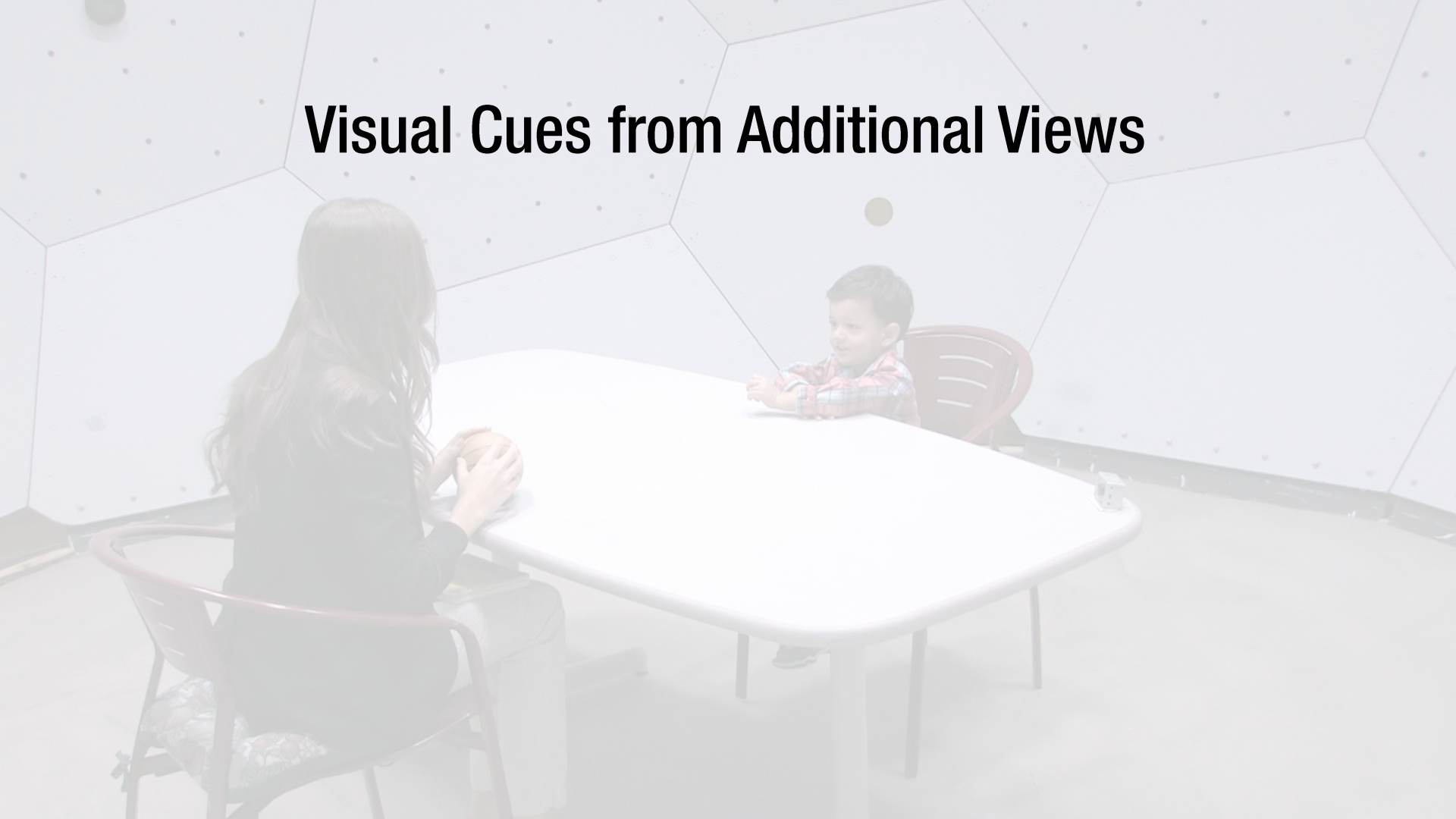
DIY: A Multiview Camera System
Fast forwad


Occlusion
Ambiguous visual semantics



Visual Cues from Additional Views



Disparity

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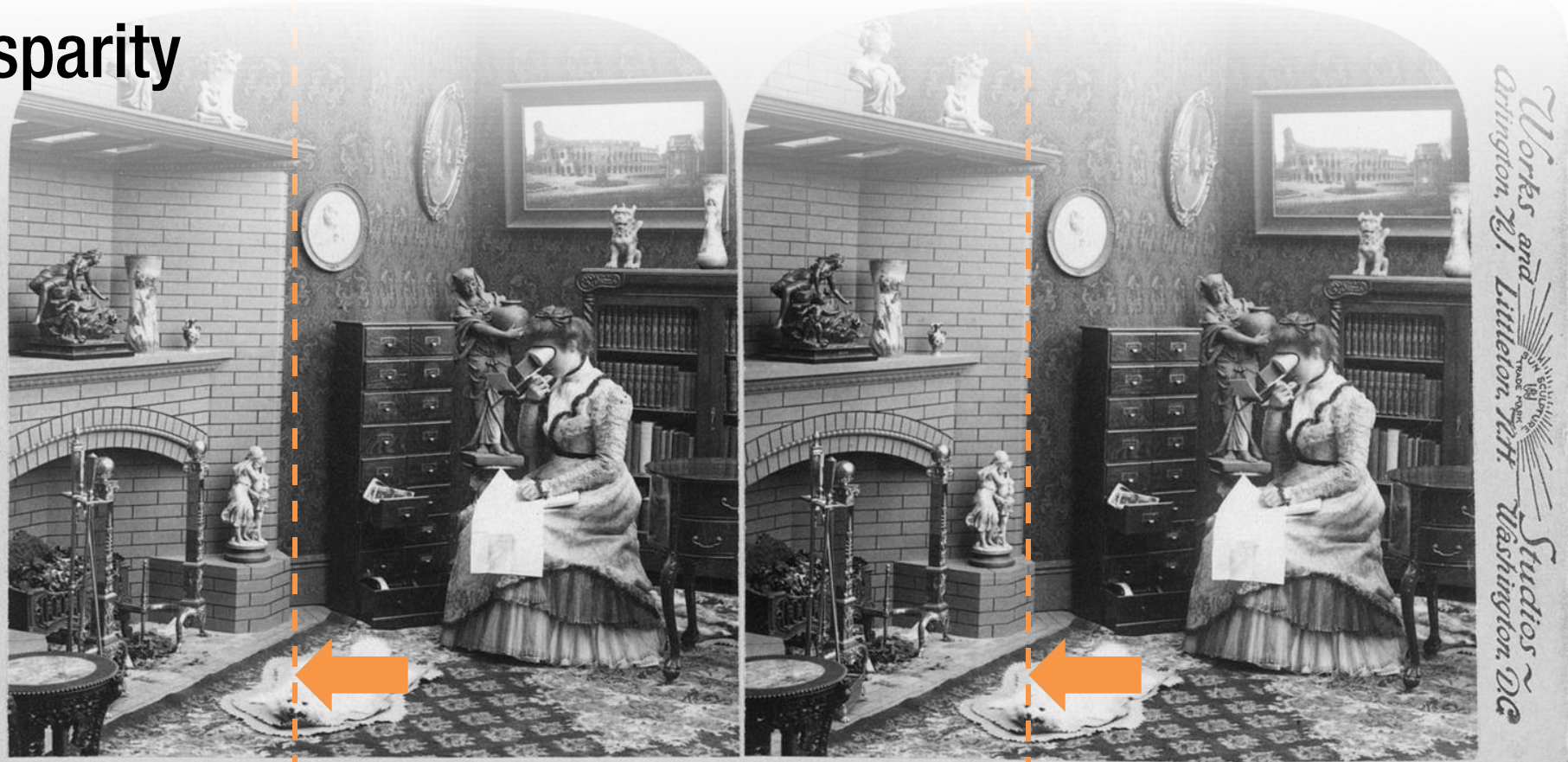
(2)

Disparity



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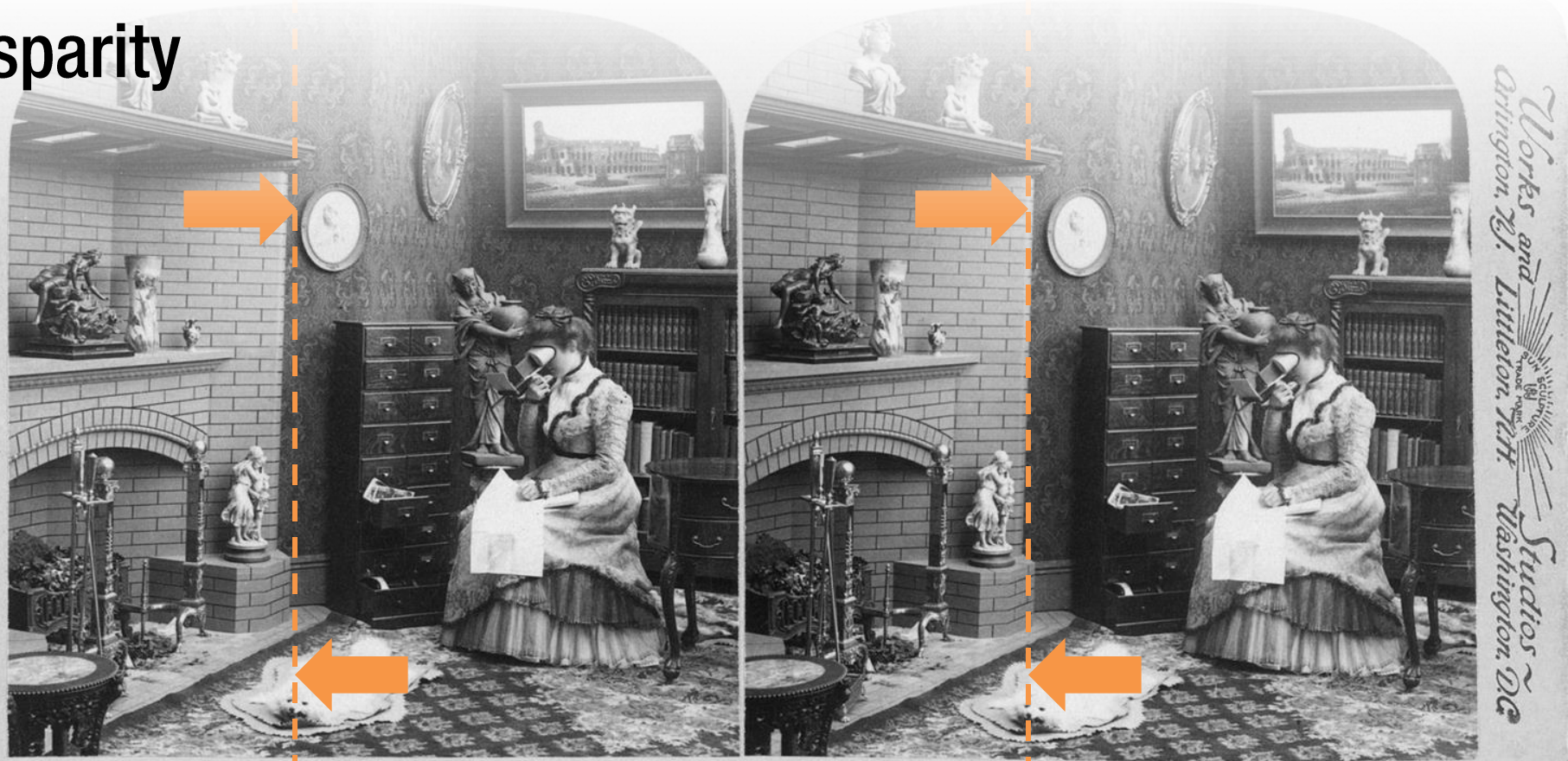

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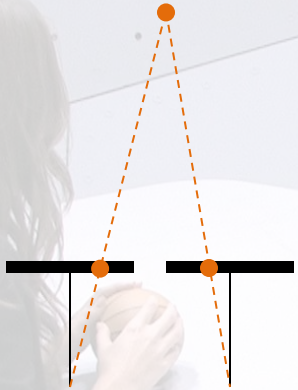
Visual Cues from Additional Views

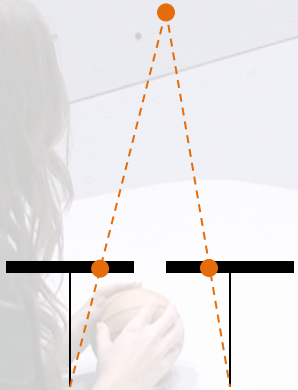
Disparity

Visual Cues from Additional Views



Disparity

Visual Cues from Additional Views



Disparity

Light field

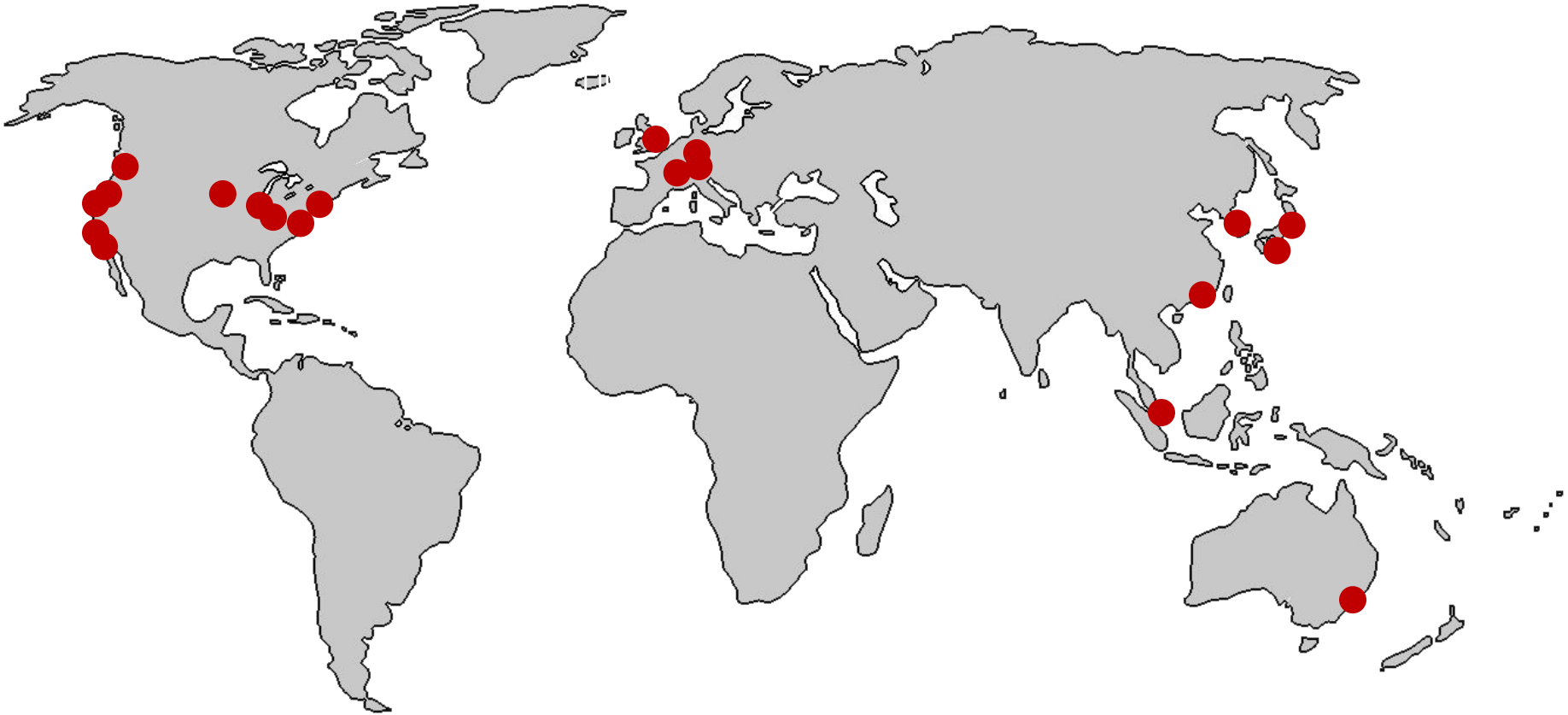
Hole Filling

One camera

Two cameras

Multicamera system is useful.

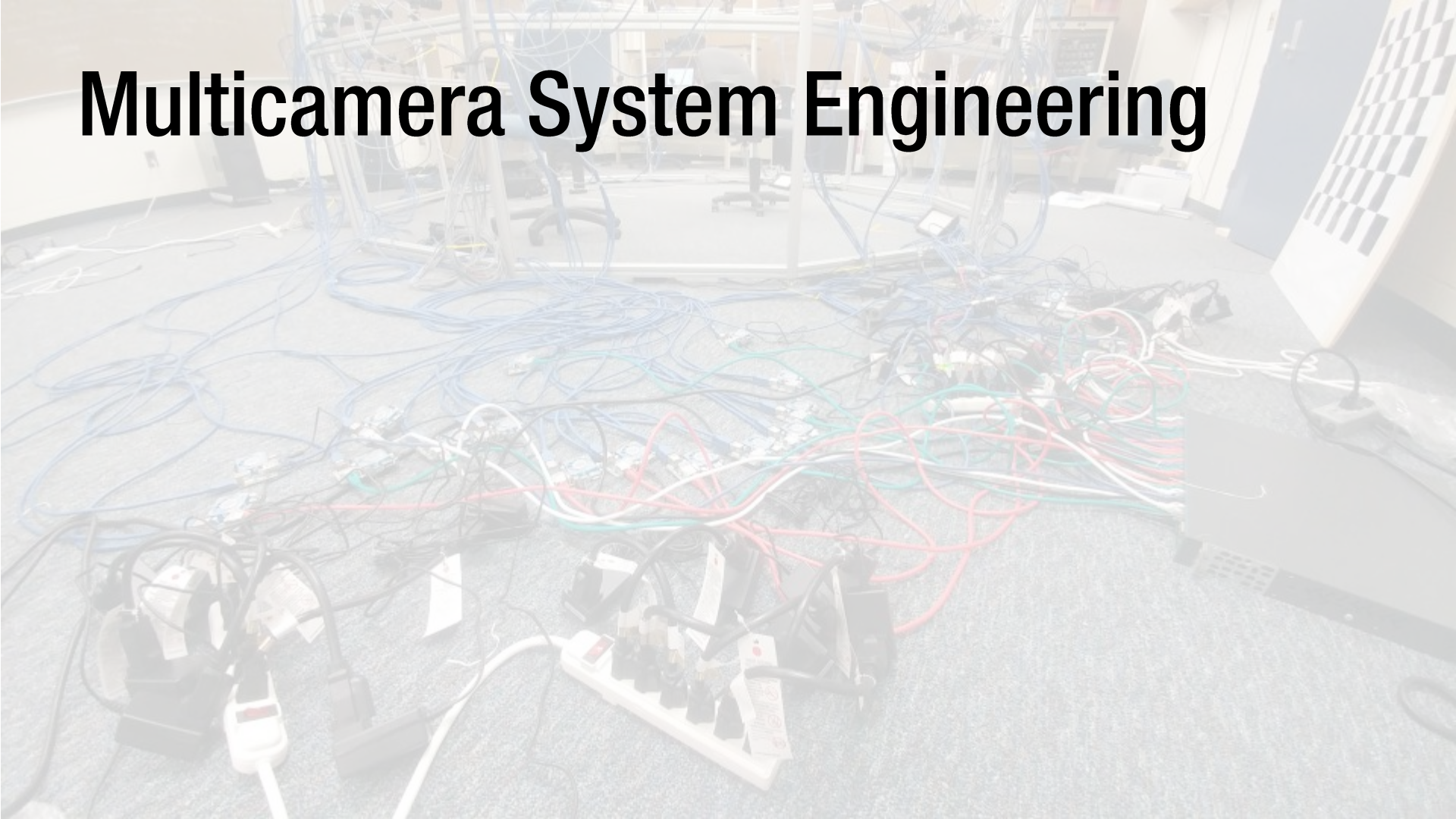
No readymade multicamera system.



Multicamera Systems For Motion Analysis Research*

*The list may be incomplete.

Multicamera System Engineering

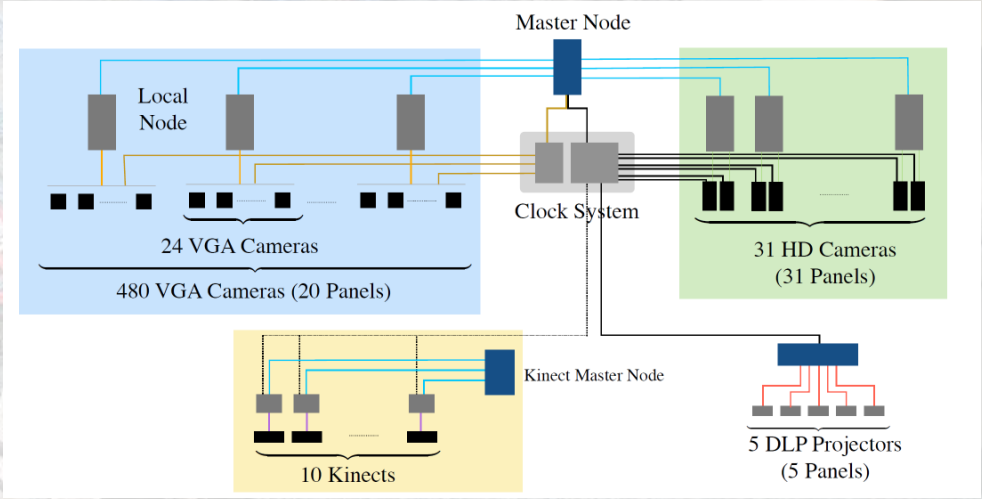


Multicamera System Engineering

Hardware design

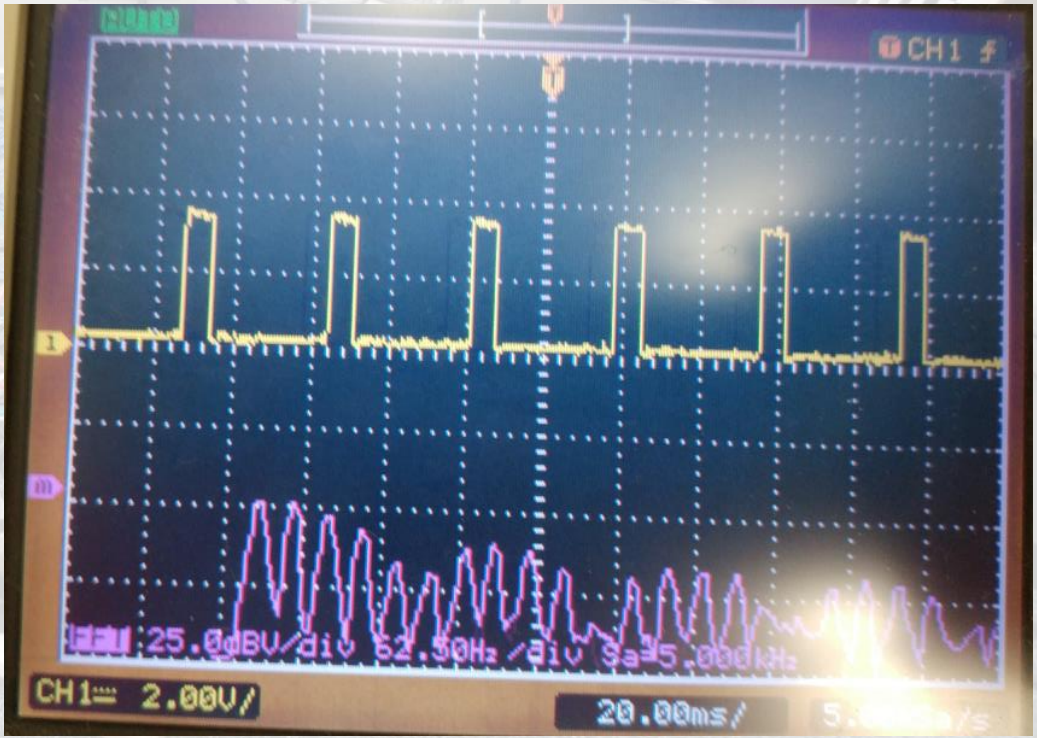
Multicamera System Engineering

Hardware design
Camera network architecture



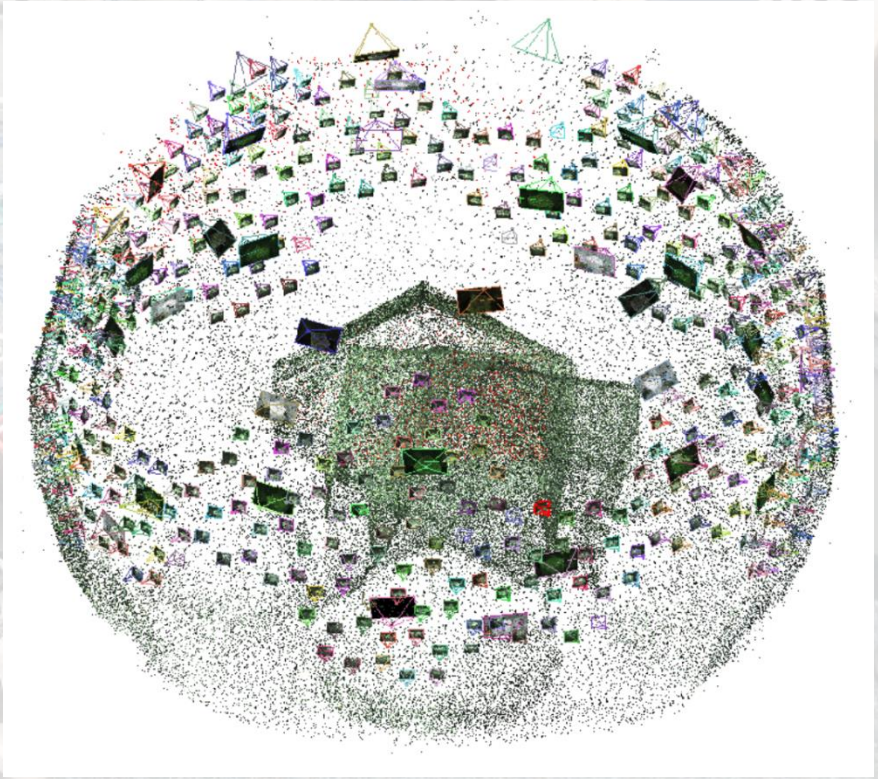
Multicamera System Engineering

Hardware design
Camera network architecture
Camera synchronization



Multicamera System Engineering

Hardware design
Camera network architecture
Camera synchronization
Camera calibration

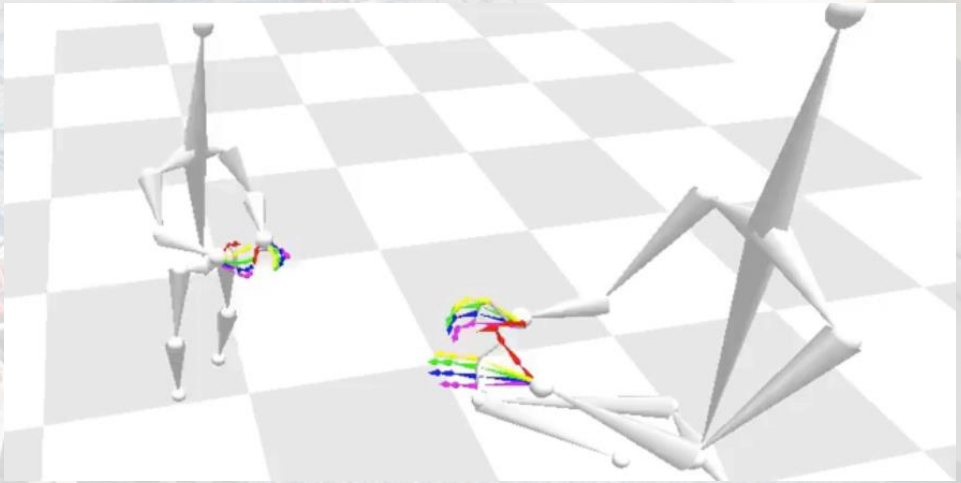


Multicamera System Engineering

Hardware design
Camera network architecture
Camera synchronization
Camera calibration
Distributed computing / storage

Multicamera System Engineering

Hardware design
Camera network architecture
Camera synchronization
Camera calibration
Distributed computing / storage
Model representation

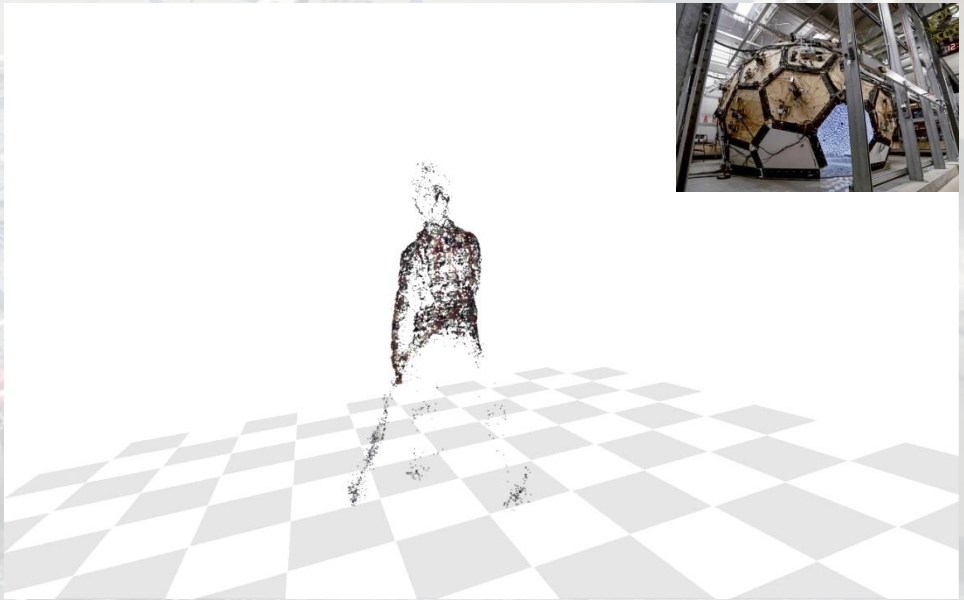


Multicamera System Engineering

Hardware design
Camera network architecture
Camera synchronization
Camera calibration
Distributed computing / storage
Model representation
Realtime motion capture

Multicamera System Engineering

Hardware design
Camera network architecture
Camera synchronization
Camera calibration
Distributed computing / storage
Model representation
Realtime motion capture



Multicamera Systems For Motion Analysis Research*

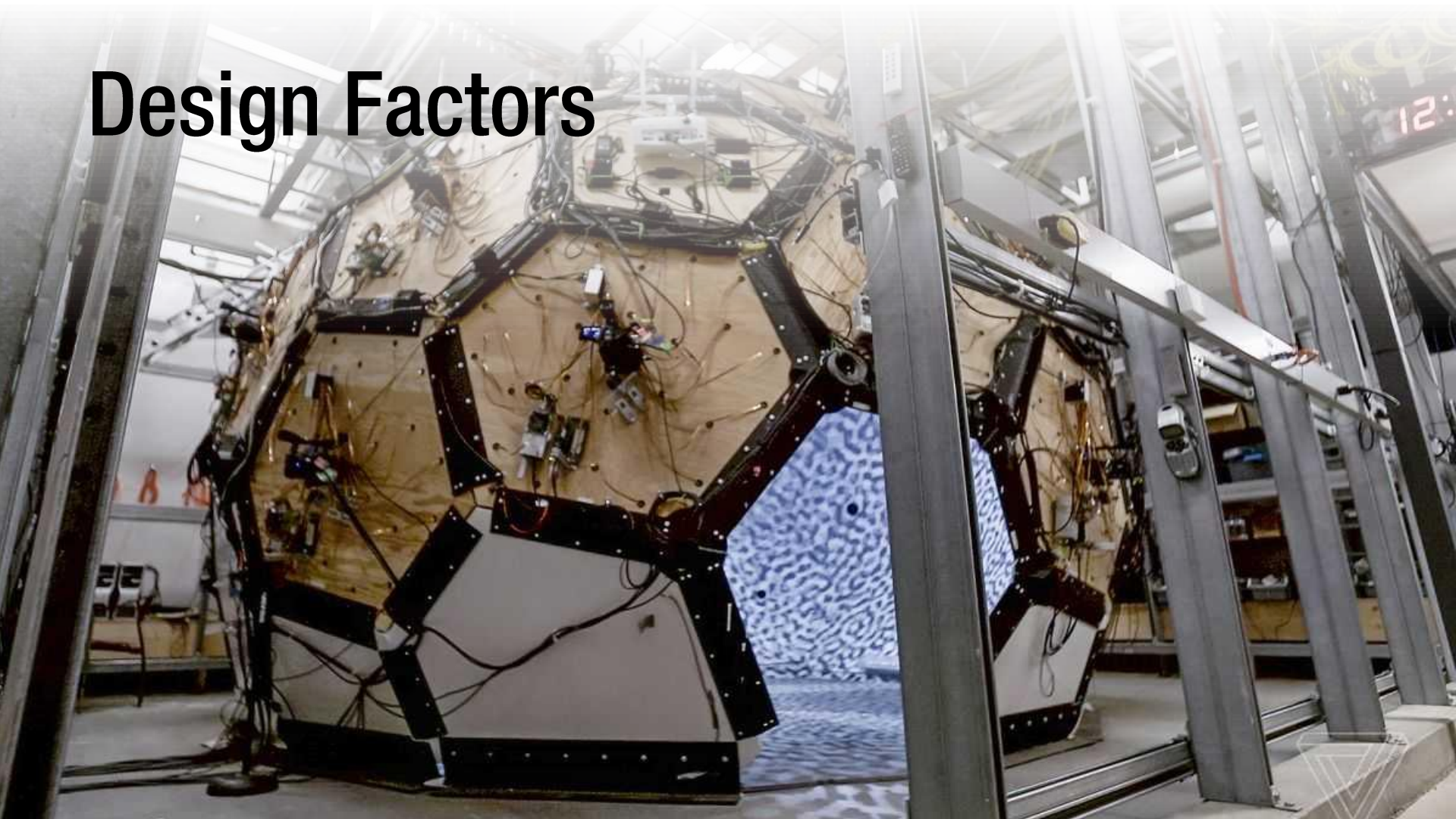
*The list may be incomplete.

Tutorial goal:

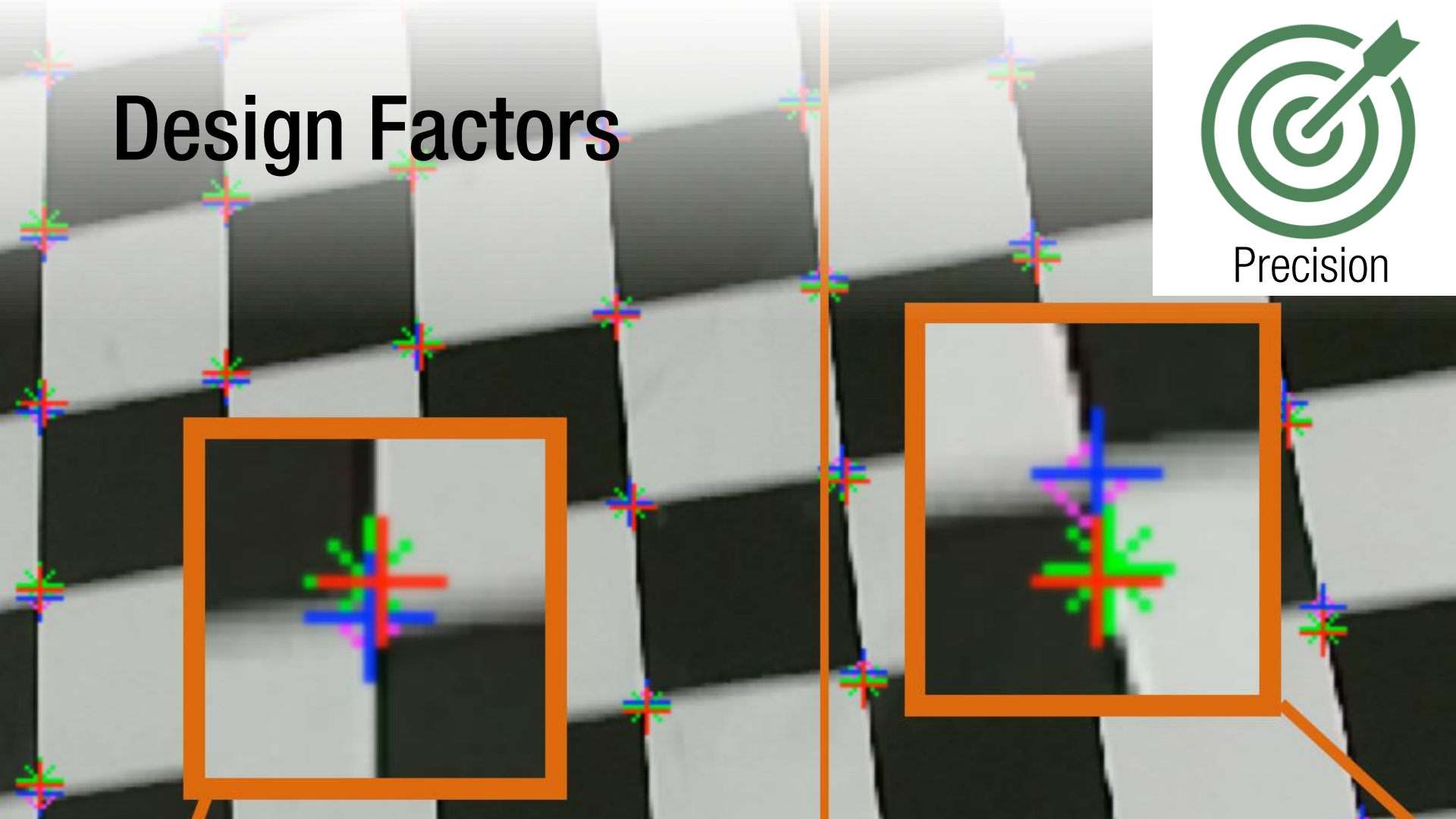
To provide an engineering manual for

1. building a customized multicamera system
2. developing a computational representation
3. leveraging an existing dataset/models

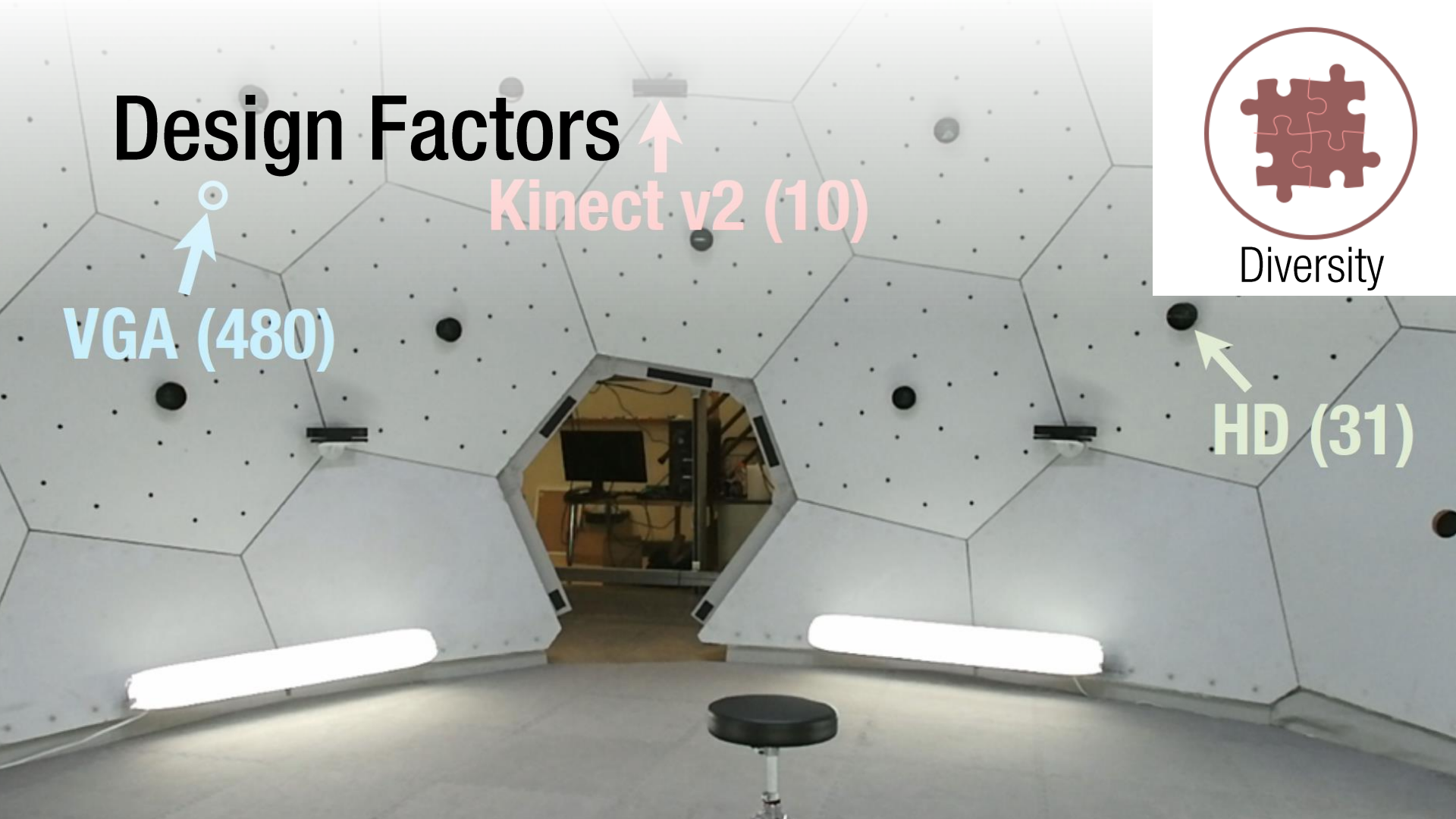
Design Factors



Design Factors

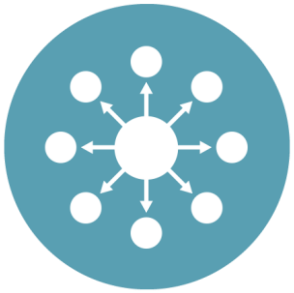


Precision


Design Factors
Kinect v2 (10)
VGA (480)
HD (31)
Diversity

Design Factors

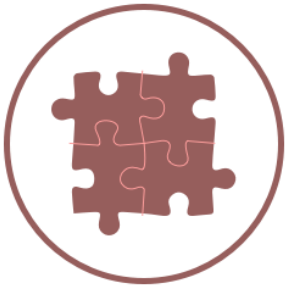
6.37e+9 pixel/sec



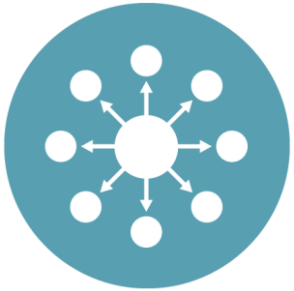
Scalability

Design Factors

Precision

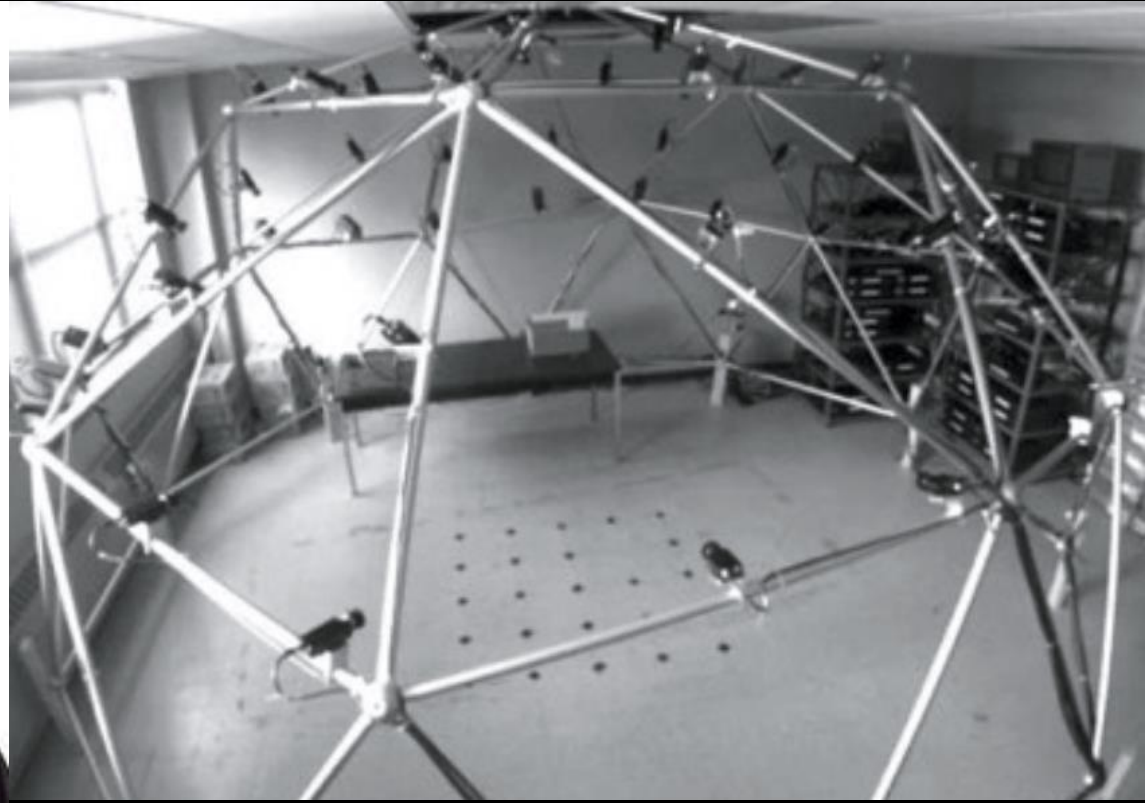


Diversity



Scalability

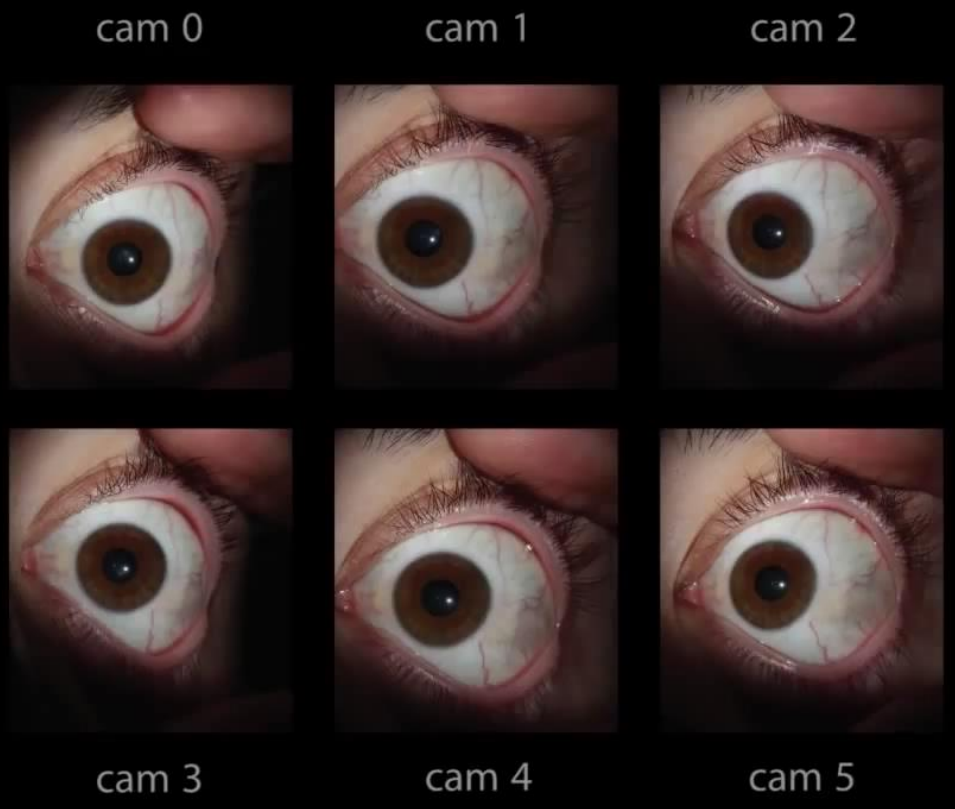
Invited Speakers



Takeo Kanade (CMU)

Many Camera Systems: How they started

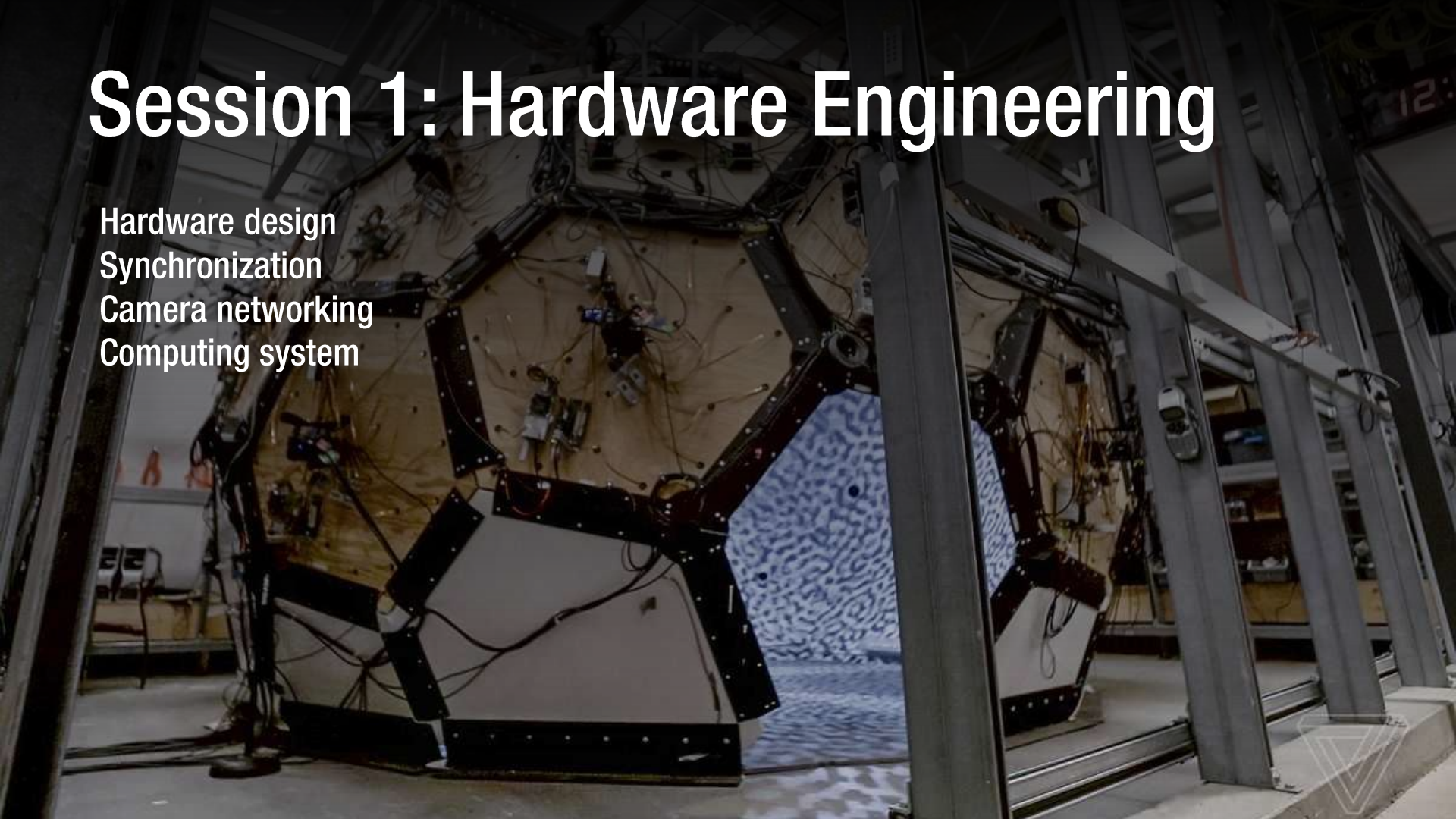
Christian Theobalt (MPI Informatik)
New Methods for Marler-less Motion and Performance Capture and the Multi-Camera Studio Behind



Thabo Beeler and Derek Bradley (Disney Research Zurich)

Multi-view Capture for High Resolution Digital Humans

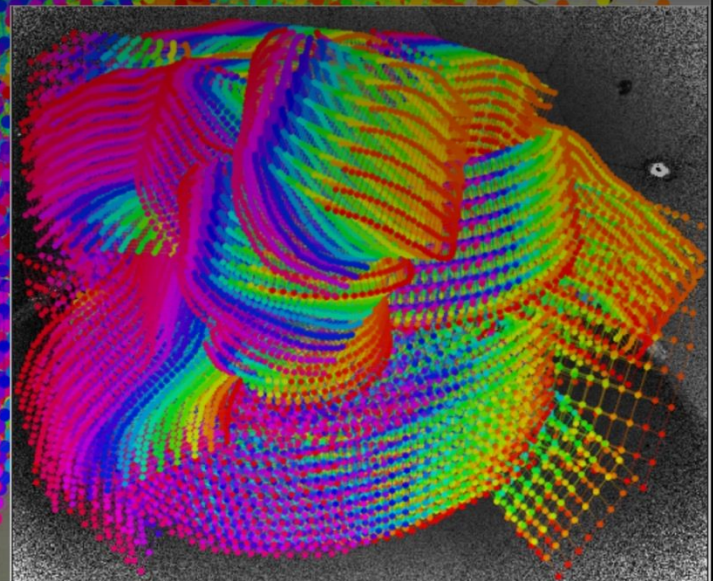
Session 1: Hardware Engineering



Hardware design
Synchronization
Camera networking
Computing system

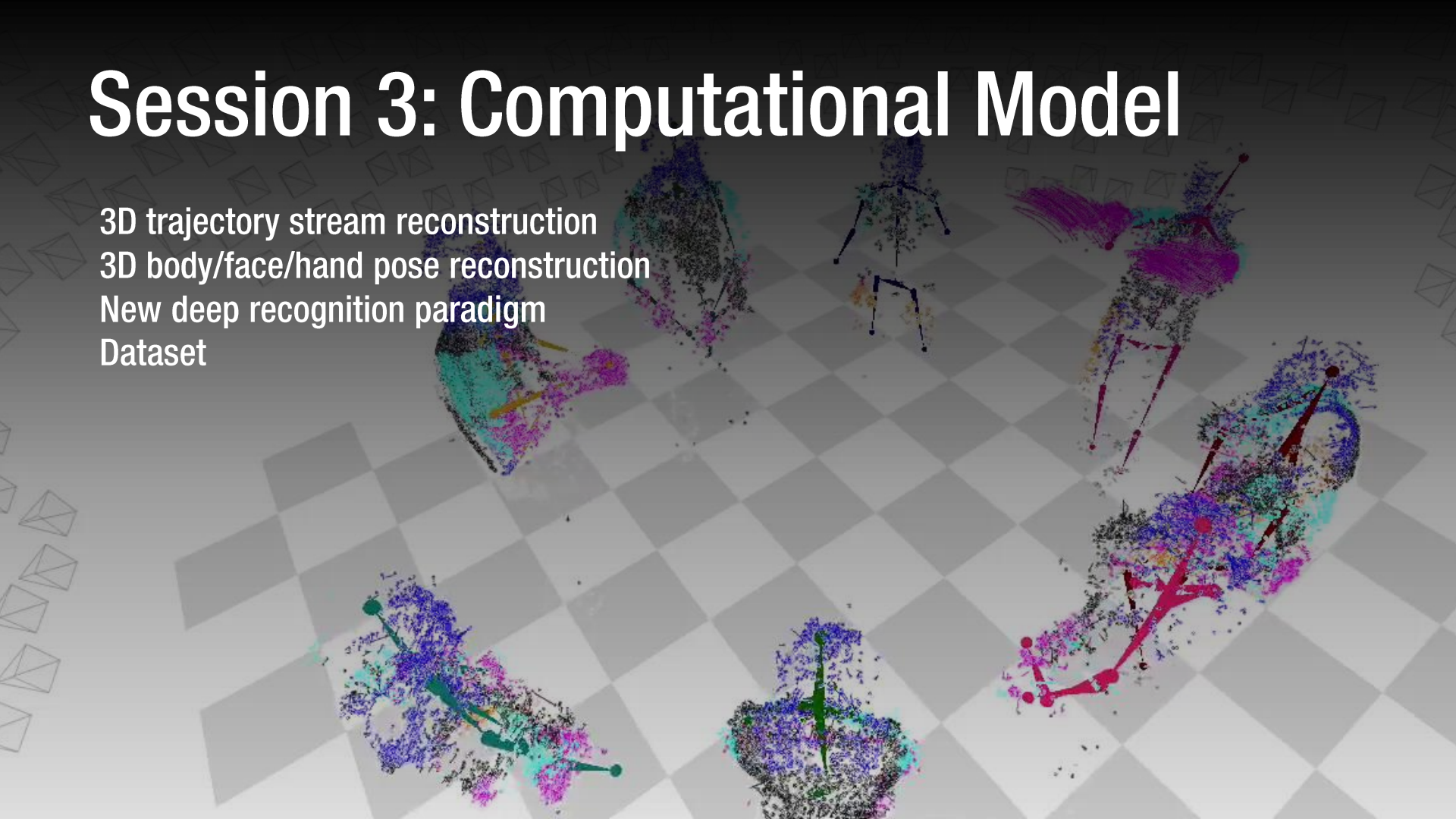
Session 2: Software Engineering

Multimodal synchronization
Calibration
Data communiation and storage
Lighting

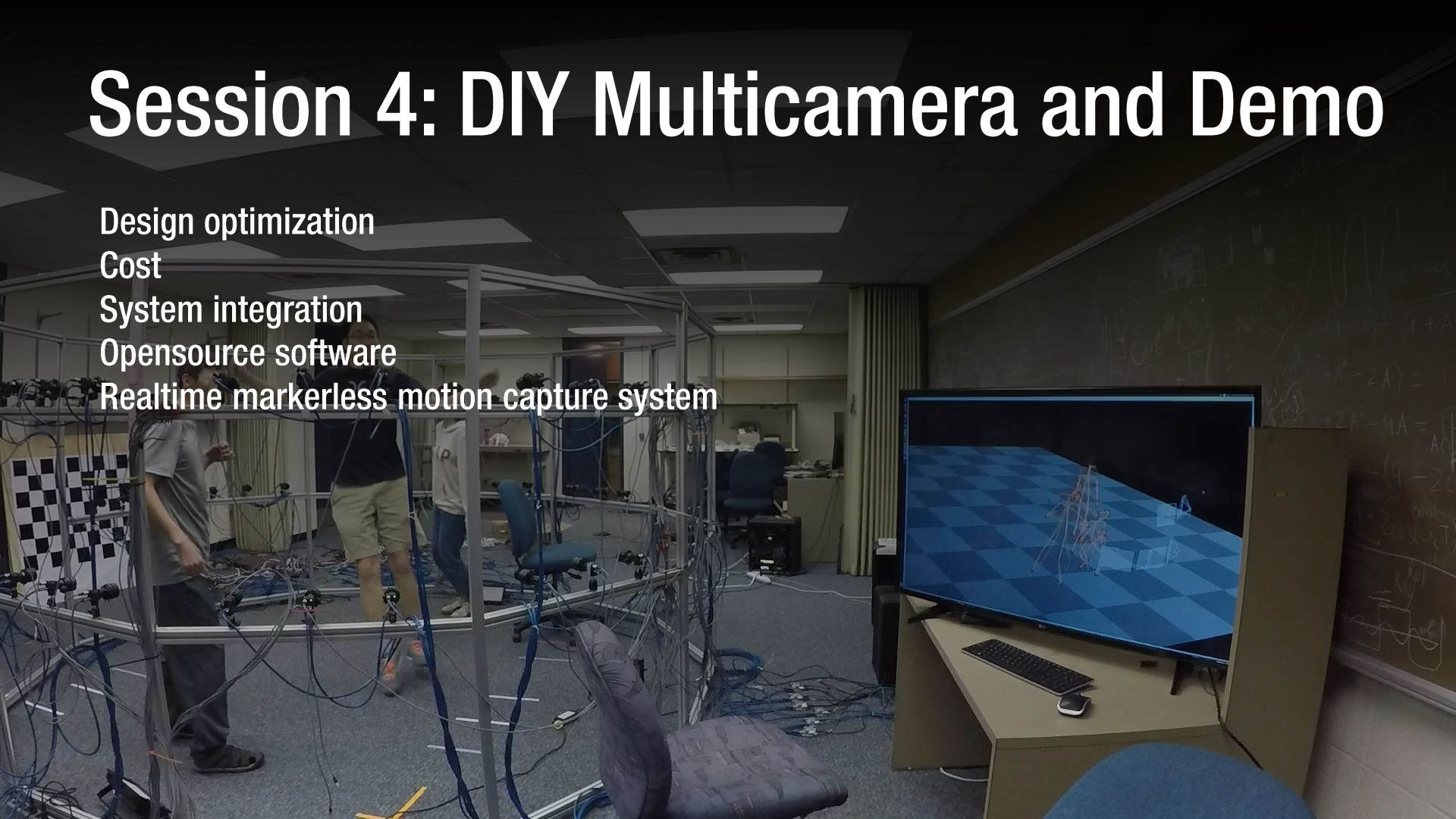


Session 3: Computational Model

3D trajectory stream reconstruction
3D body/face/hand pose reconstruction
New deep recognition paradigm
Dataset



Session 4: DIY Multicamera and Demo



Design optimization
Cost
System integration
Opensource software
Realtime markerless motion capture system