

**ISO/IEC JTC 1/SC 24****Computer graphics, image processing and environmental data representation****Secretariat: BSI (United Kingdom)****Document type:** Meeting Report**Title:** N 4032 WG9-2017-InfoModel-LAE-MAR**Status:****Date of document:** 2017-10-25**Expected action:** INFO**No. of pages:** 33**Email of secretary:** [charles.whitlock@bsigroup.com](mailto:charles.whitlock@bsigroup.com)**Committee URL:** <http://isotc.iso.org/livelink/livelink/open/jtc1sc24>

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# Information Model for LAE in MAR

ISO/IEC JTC1 SC24 Plenary Meeting

7-11 August, 2017

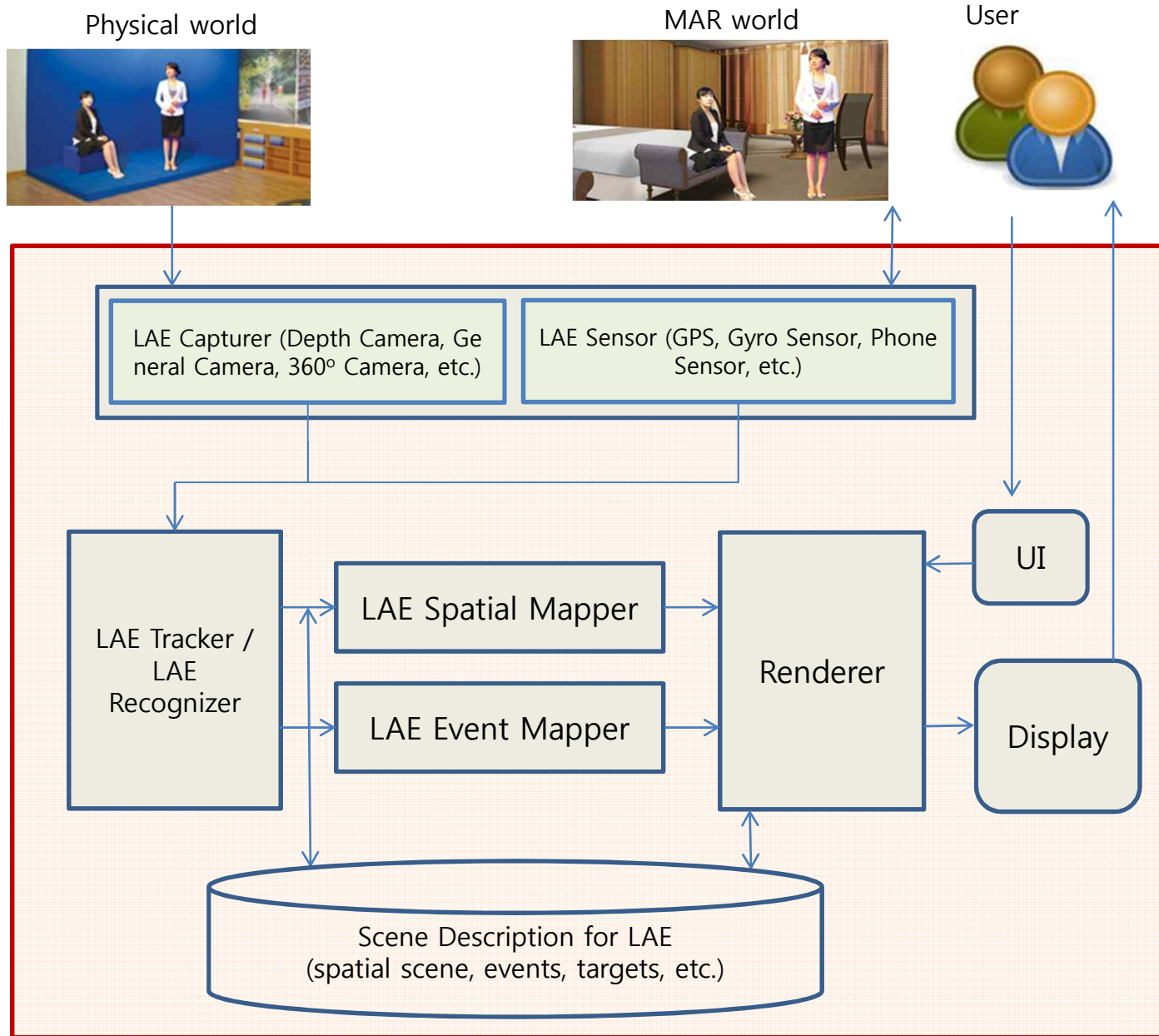
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**CGaC** *Computer Graphics And Contents Lab*





# Live Actor and Entity in a MAR world



An LAE integrated in a 2D video virtual world after Chromakeying



LAEs integrated into a 3D virtual world after Chromakeying

# Live Actor and Entity in a MAR world



(c) An LAE interact with virtual object in a 3D virtual world after Chromakeying



(d) Virtual representation of a LAE in MAR world as a 3D full virtual object

## Live Actor and Entity in a MAR world



A virtual LAE restricted to and communicating in a MAR world [Microsoft Holoportation ]



[Mingsong Dou, etc, Fusion4D, 2016]

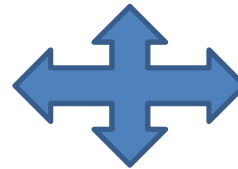
# Characteristics of a LAE representation in MAR world

## LAE

- 2D Chromakeying
- 3D full model
- Virtual Actor and Entity
- Virtual Actor and Entity (H-Anim)

## Environment

- 2D Image
- VR Environment  
(360 VR, Full 3D virtual space)



Spatial Mapping  
Event Mapping



MAR scene description for controlling a LAE

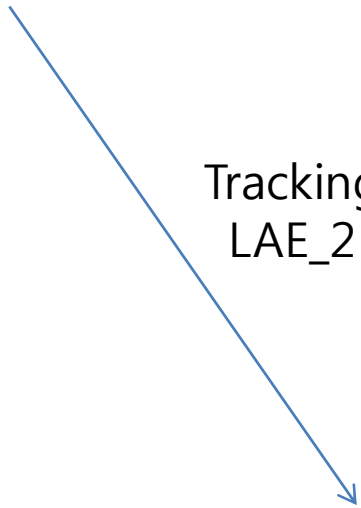




Tracking  
LAE\_1



Tracking  
LAE\_2



(non)Chromakeying

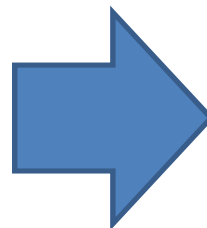




Fusion4D



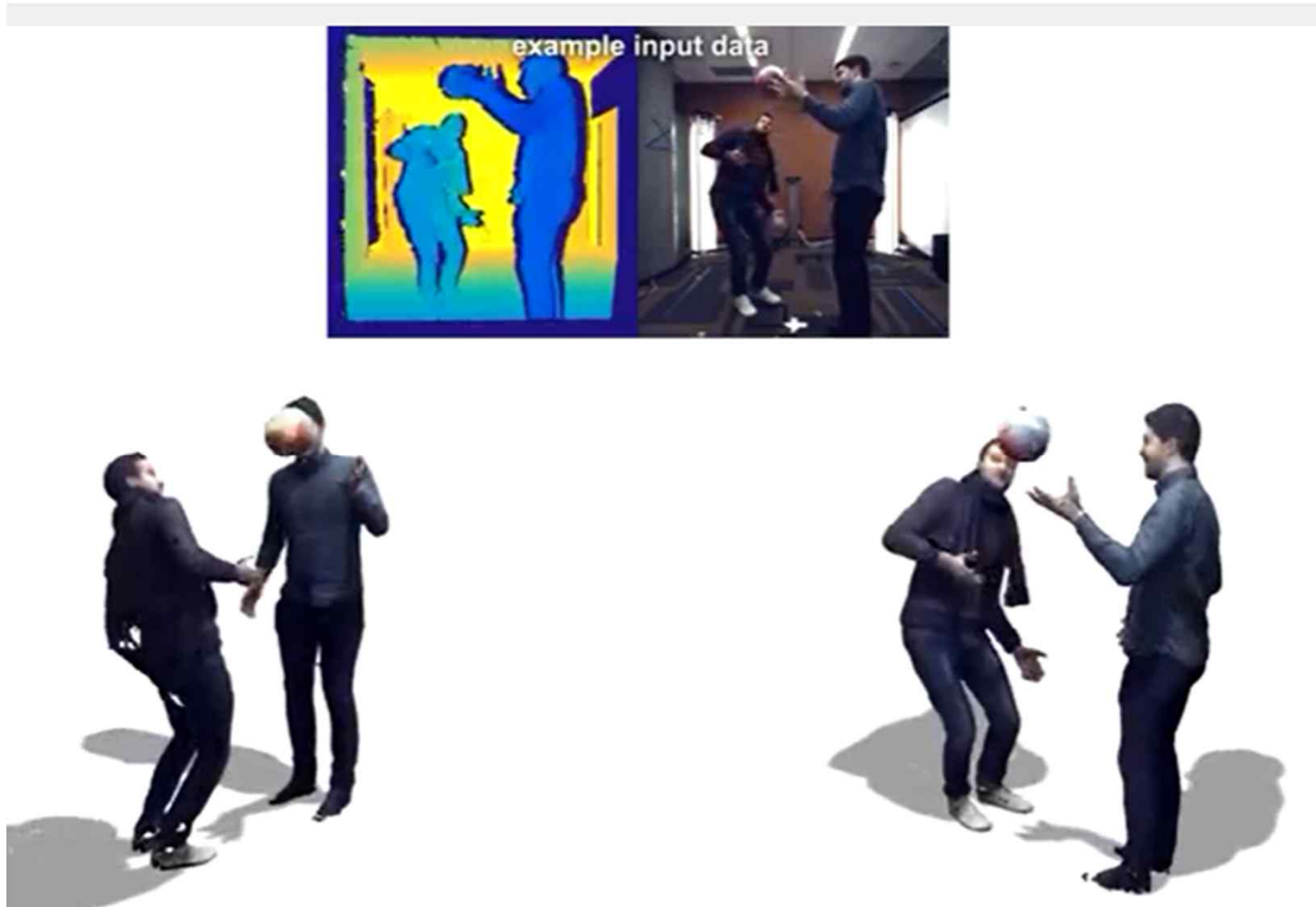
Full 3D Model

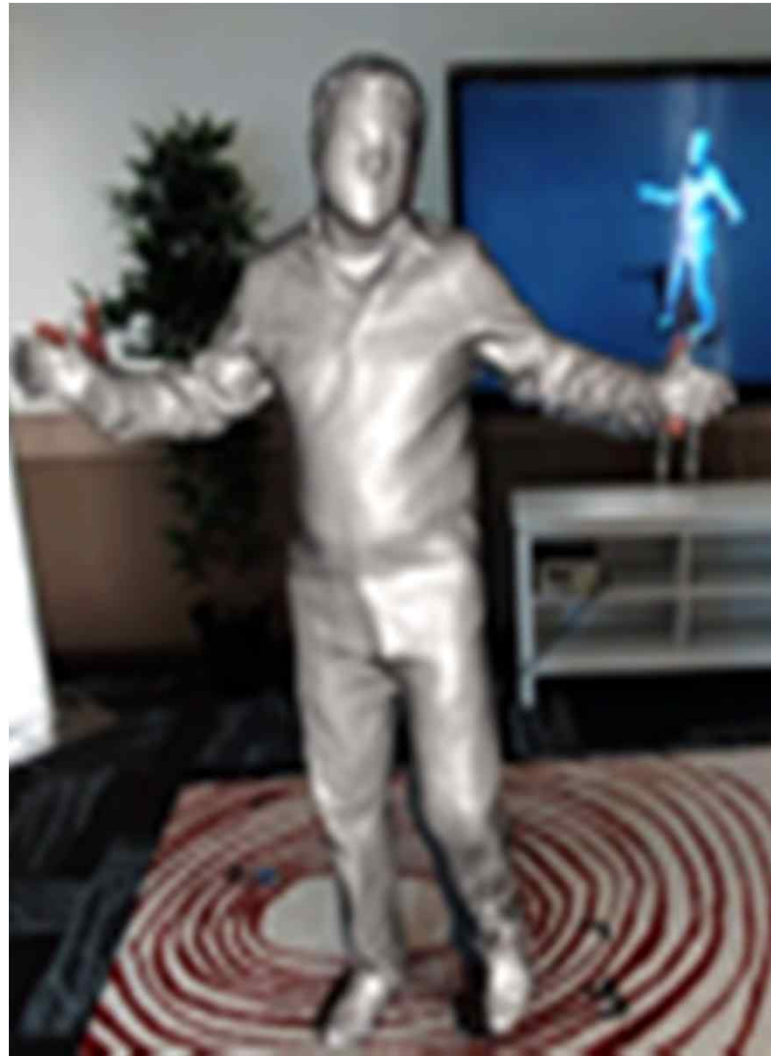


## Fusion4D Another Example

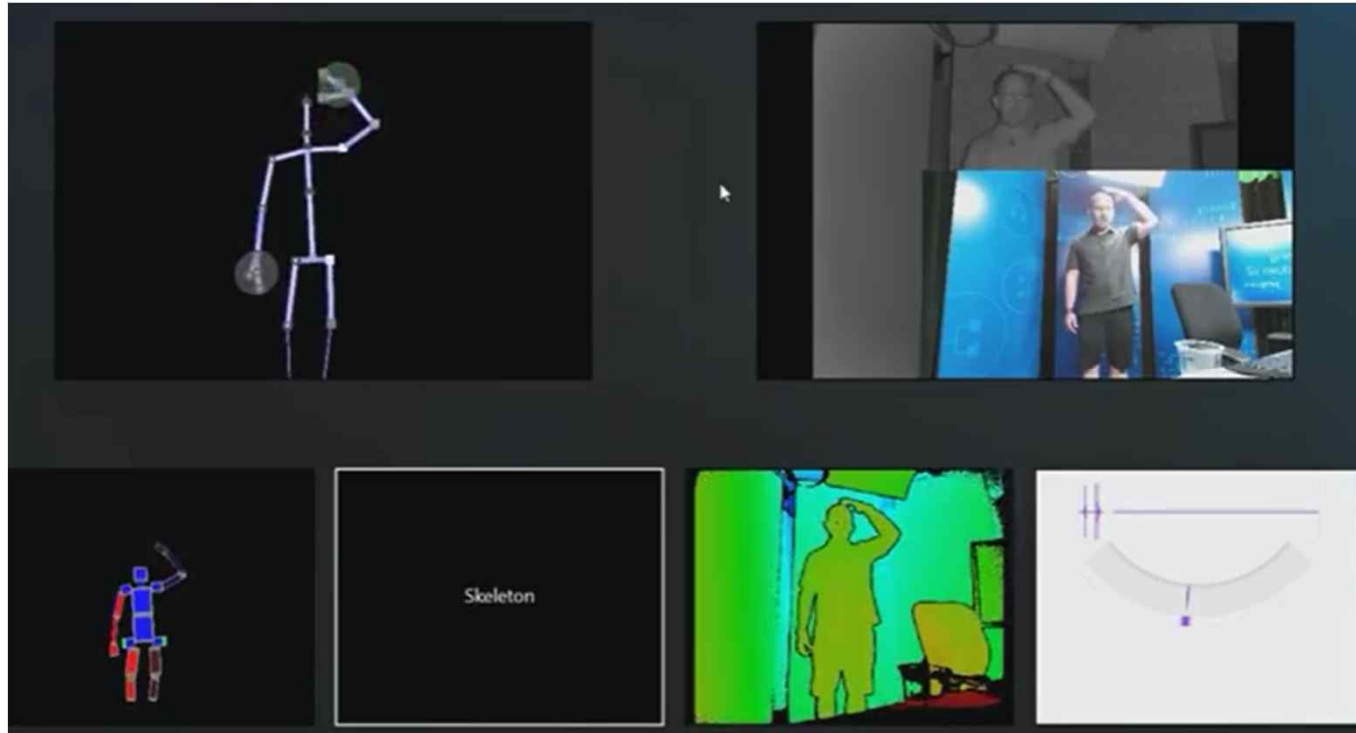


## Fusion4D Another Example





# Skeleton based LAE representation by Kinect



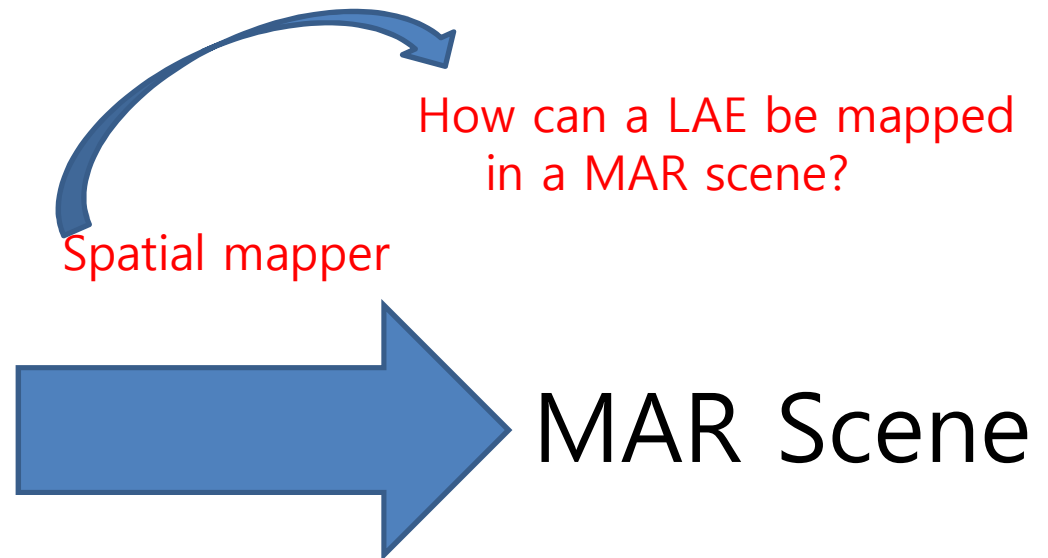
# LAE Representation

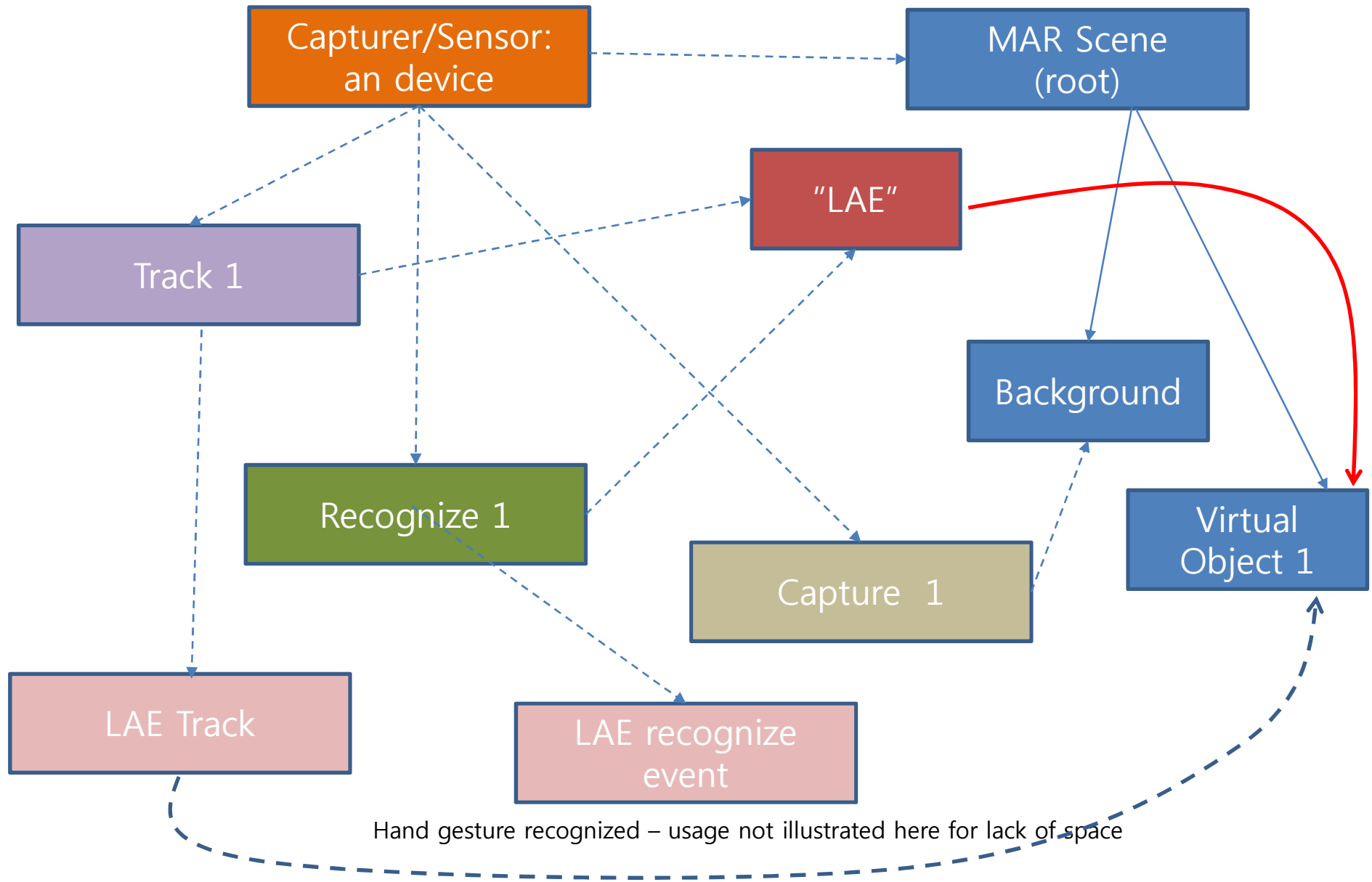
## Model

- 2D Image (Chromakeying)
- Full 3D models
- Skeleton Model (with Skin)

## Property

- Physical world Information
- Position
- Orientation
- Scale
- Behavior (Walking, Running, etc)





# LAE Events



Virtual DDR dancing
















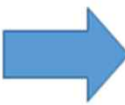



Dodging a piece of wood



Crossing a balance beam



Initial state	LAE gestures	Left hand	Right hand	Callback functions	
			-	<b>Left (Rotation)</b> Move the camera in positive direction of axis Y based on 3D model	
		-		<b>Right (Rotation)</b> Move the camera in negative direction of axis Y based on 3D model	
			-		<b>Up (Rotation)</b> Move the camera in positive direction of axis X based on 3D model
			-		<b>Down (Rotation)</b> Move the camera in positive direction of axis X based on 3D model
			-		<b>Zoom In (Scaling)</b> Decrease distance between a camera position and the center of 3D model
			-		<b>Zoom Out (Scaling)</b> Increase distance between a camera position and the center of 3D model

# LAE Representation

## Model

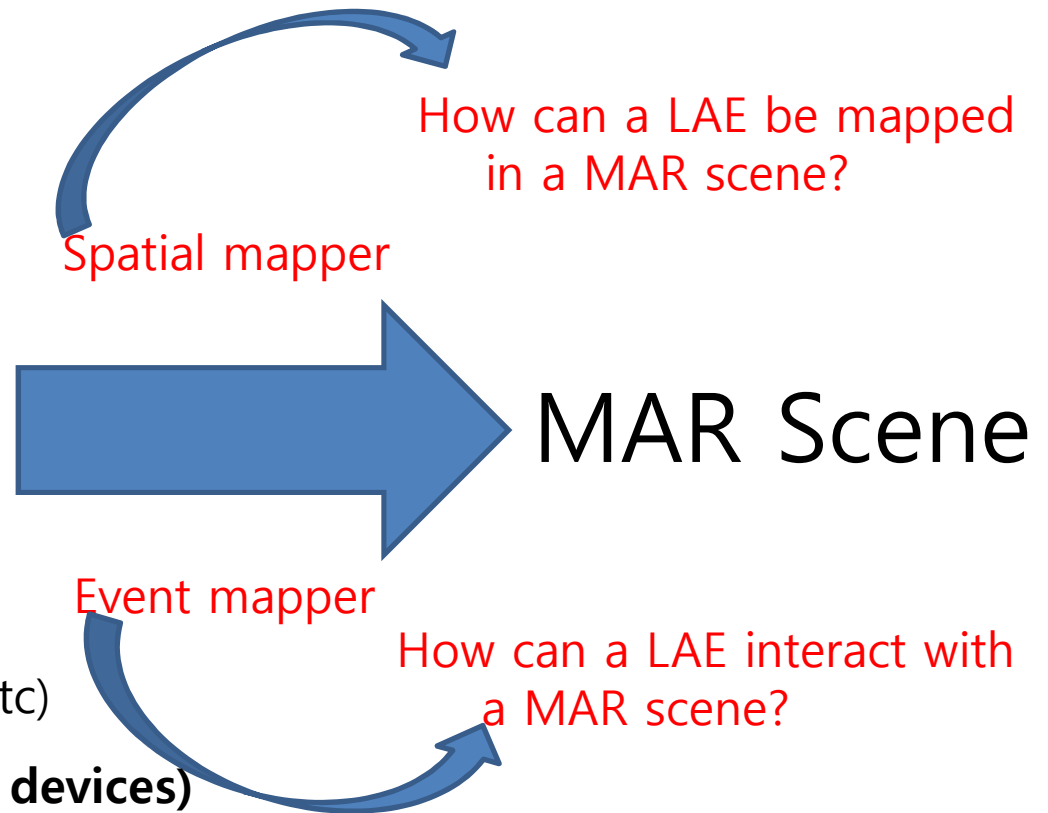
- 2D Image (Chromakeying)
- Full 3D models
- Skeleton Model (with Skin)

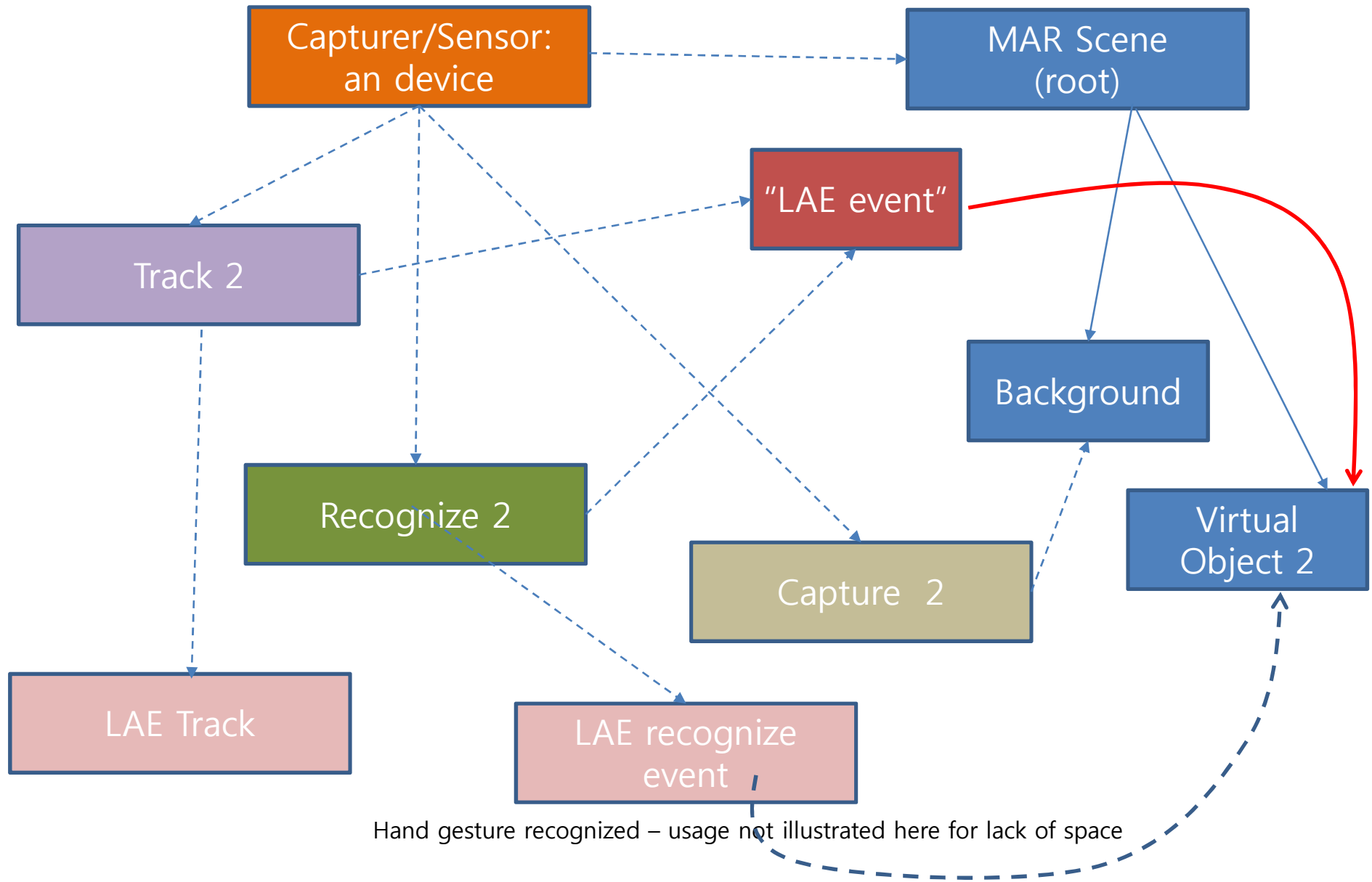
## Property

- Physical world Information
- Position
- Orientation
- Scale
- Behavior (Walking, Running, etc)

## Events (him/herself + handheld devices)

- Gesture
- Voice





## Objective of this work

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Modeling a LAE

Developing LAE-MAR Applications

File Level Description for a LAEMAR application



## Camera Capturer & 2D chromakeying image for a LAE

```
//Capturer
<LAECapturer
  id = "dcam0" type = "camera" fov="50" framerate= "60" >
</LAECapturer>

<LAETracker
  id = "t1, laecapturer = "dcam0" laeid = "id1" chromakeying = "true" >
</LAETracker>

//Scene Description for spatial mapping of LAE
<LAESMSceneDesc id = "smsd1" description = "" initialPosition
= "2 2 2" LAEObject= "obj1d" > </ LAESMSceneDesc >
<MARScene id= "sc1" MARScene= "demo.x3d" > </MARScene>

//Spatial Mapping
<LAESpatialMapper id = "sm1" tracker= "t1" sceneDescId = "smsd1" >
</LAESpatialMapper >

<LAERenderer id= "rd" spatialMapper= "sm1" marScene= "sc1" >
```

## Information Model for LAE-MAR

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- Define the following for
  - Live Actor and Entity
  - Capturer and Sensor
  - Tracker and Recognizer
  - Spatial Mapper and Event Mapper
  - Scene Description
- use X3D file or others for MAR Scene
- use HTML5 for Information Model Description of LAE-MAR



## NWIP

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- Submit the NWIP when the document of Information Model of MAR content is prepared for CD ballot



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# Thank you.



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