

AR Awareness in Remote Collaboration

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Outline

- CSCW and conferencing
 - problems during video conferencing
- related work
- my idea
- software design aspects

CSCW

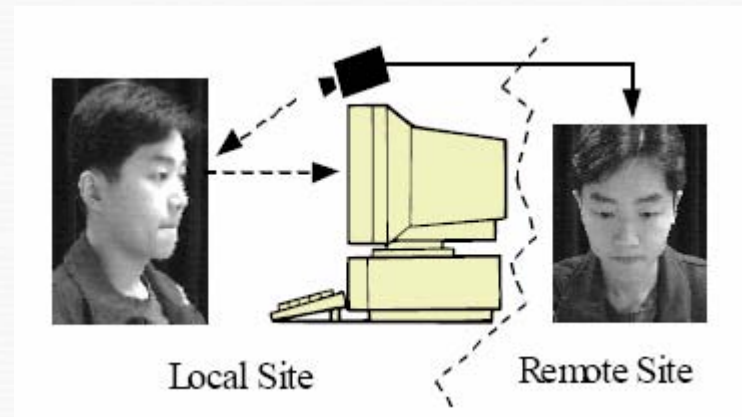
- Computer Supported Cooperative Work

		place	
		same	different
time	same	<p>Face-to-face conversation Face-to-face Interactions</p> 	<p>Remote Interactions Telephone</p> 
	different	<p>Post-it notes Ongoing tasks</p> 	<p>Communication and Coordination Letter</p> 

my focus

Video-conferencing

- desktop vs. conferencing rooms
- problem:
 - hard to gain eye contact



related work

- **HITLab** (Washington)
 - projecting video stream on markers
 - cropping the background



related work

- Studierstube (Wien)
 - sending marker pose synchronous to video stream



cAR/PE!

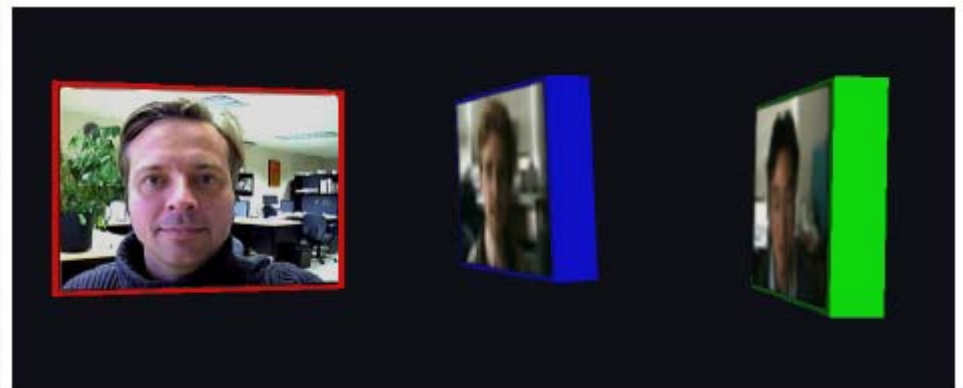
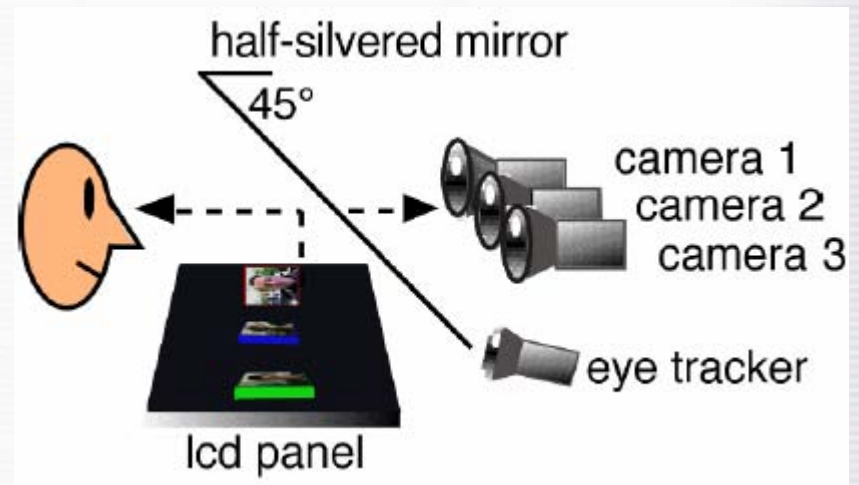
- HITLabNZ + DaimlerCrysler
 - VR application
 - free movement in space



related work

- GAZE-II

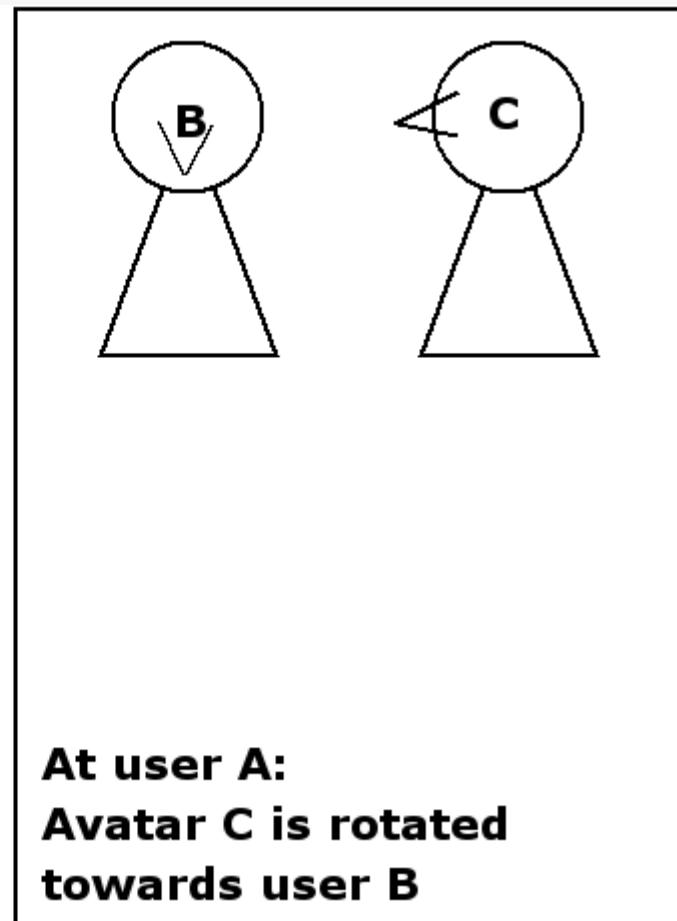
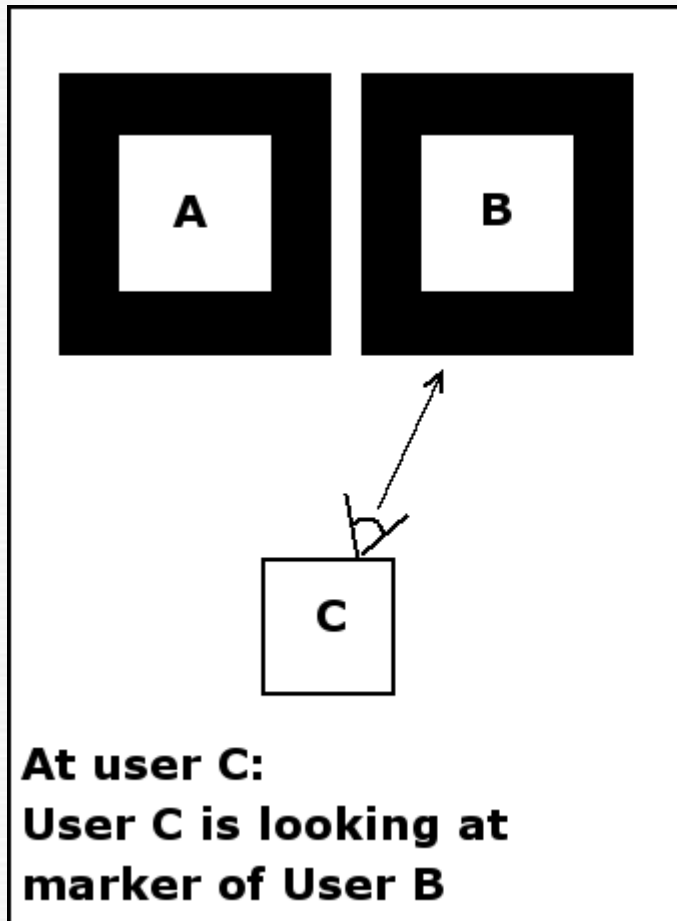
- rotating video images
- decreases quality of video stream when rotated



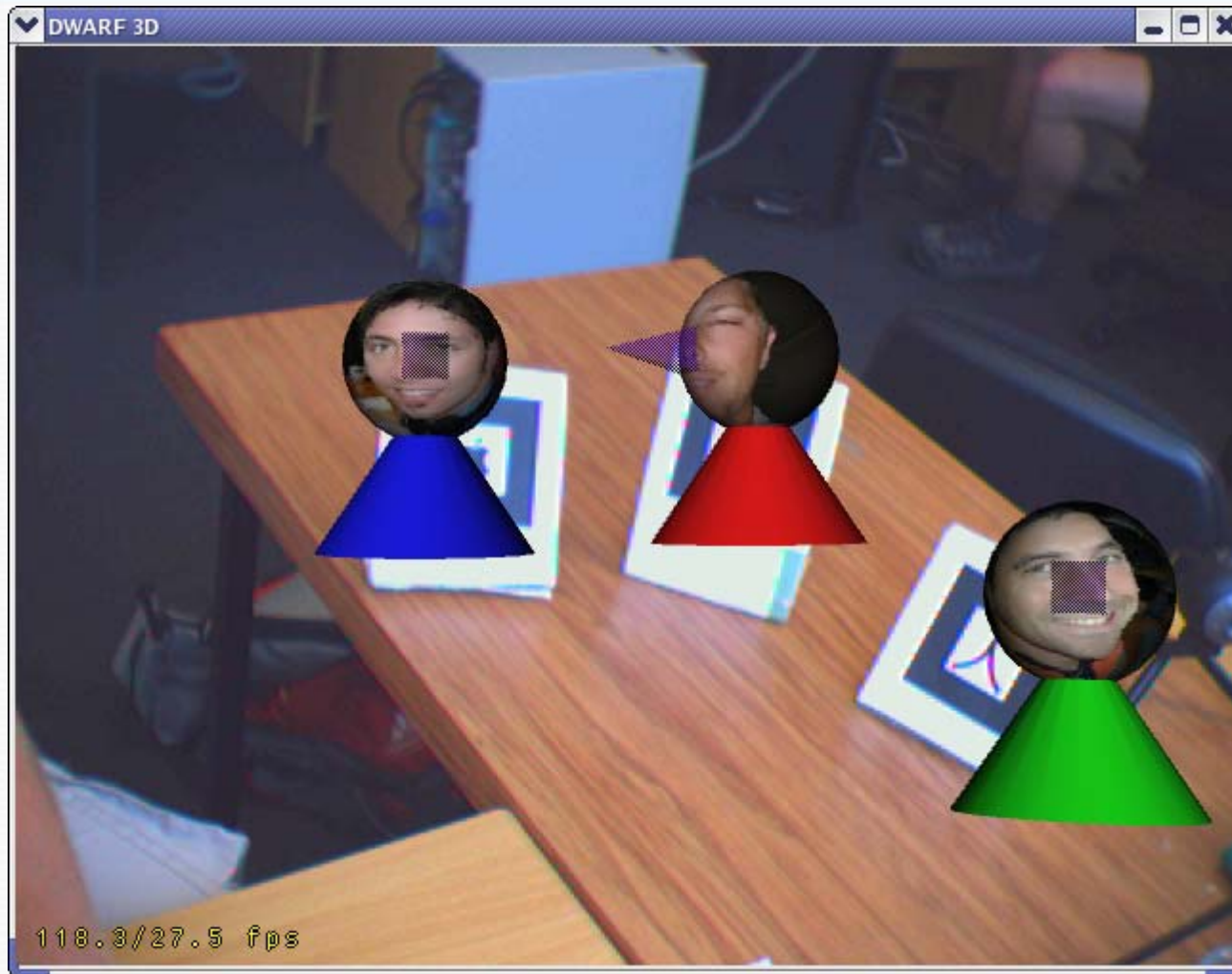
my idea

- desktop conferencing
- avatars in your familiar workspace
- capturing the users gaze and rotate the avatar accordingly

my idea



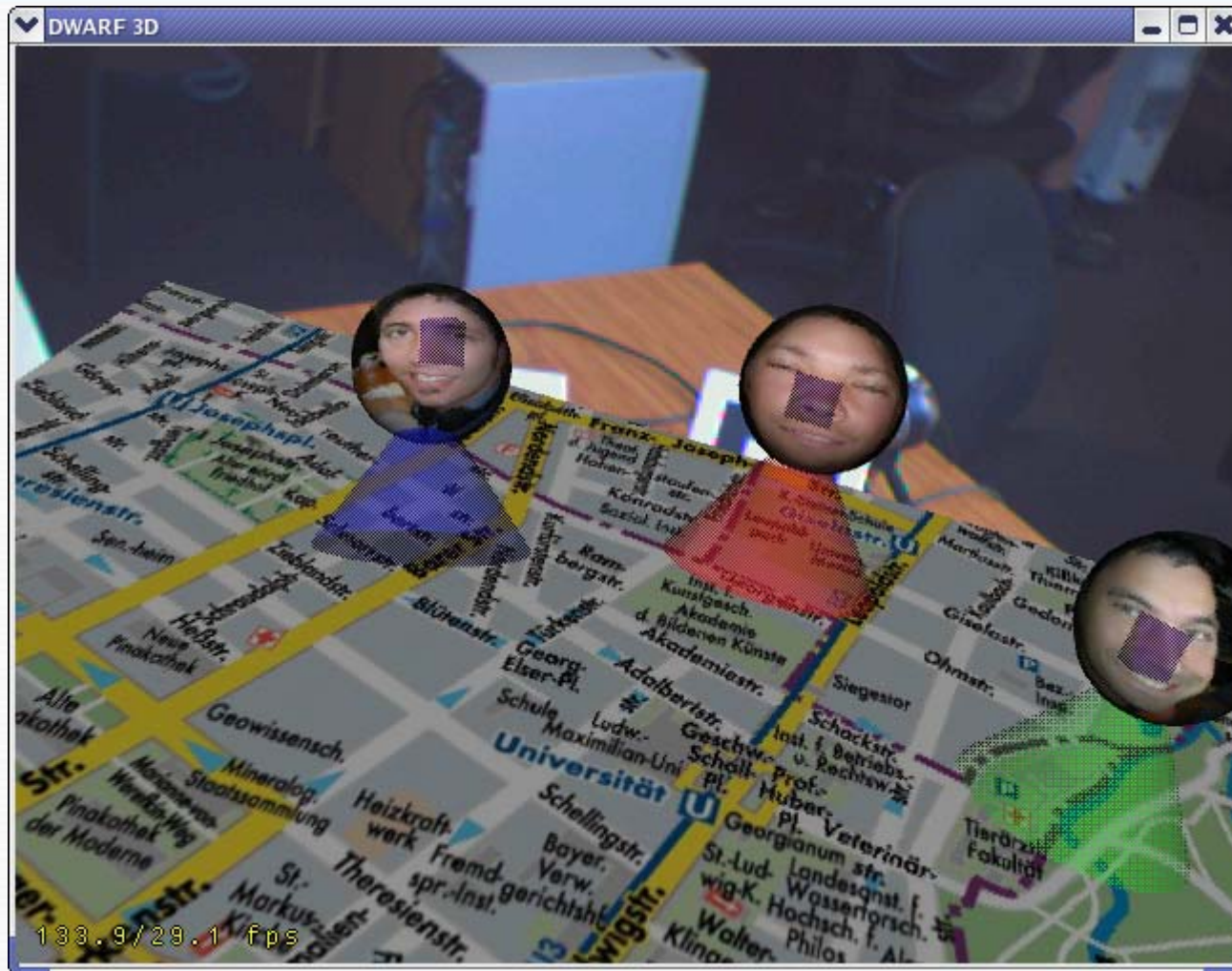
my idea



my idea (extension)

- introducing a dedicated marker as represent for a shared working object
- calculating at which exact point the user is gazing on the shared object
- using this information for visualizing at the other users shared object

my idea (extension)



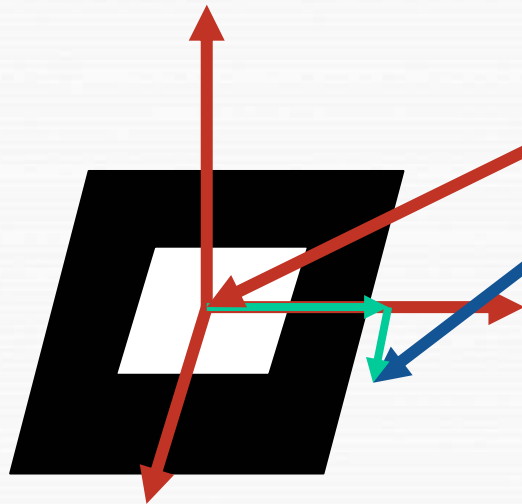
software design aspects

- implemented with the DWARF framework
- three main components
 - ViewAnalyser
 - Registration
 - Drawer



ViewAnalyser

- calculate out of the view
 - at which marker/user
 - where at the shared object



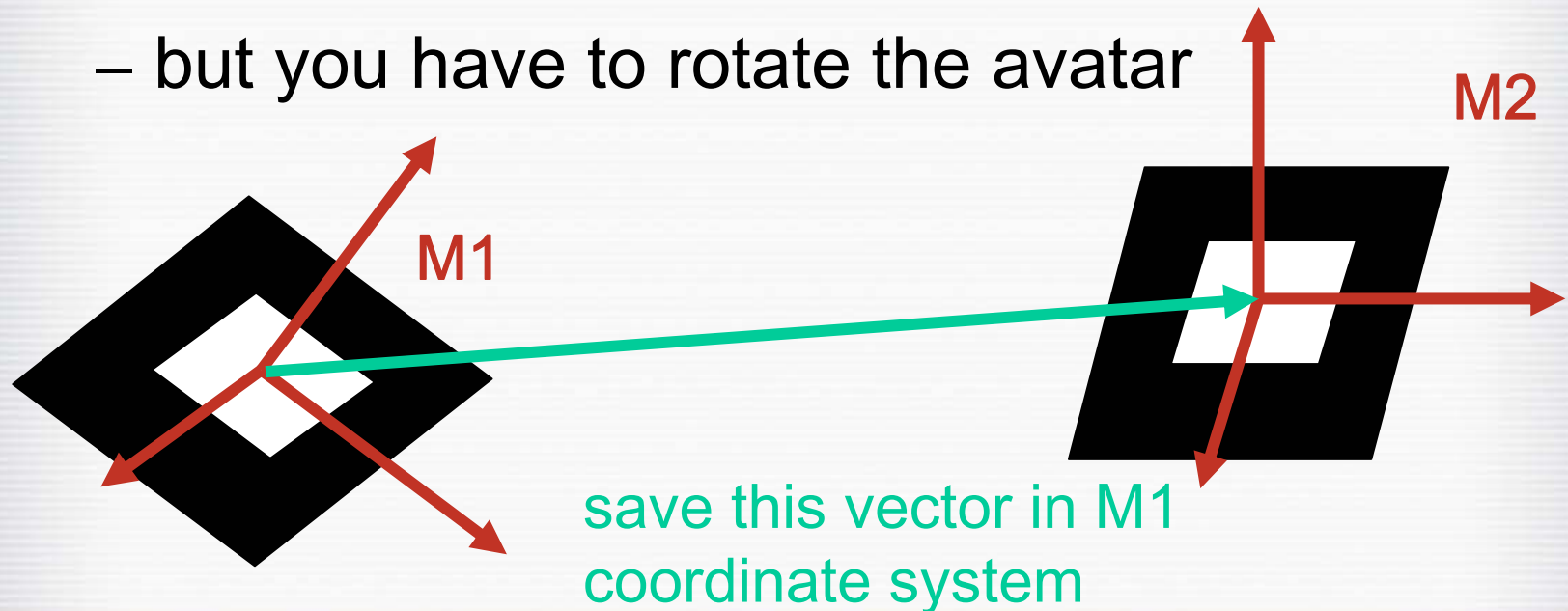
ARToolkit translation matrix

Eye vector

coordinates in the marker plane

Registration

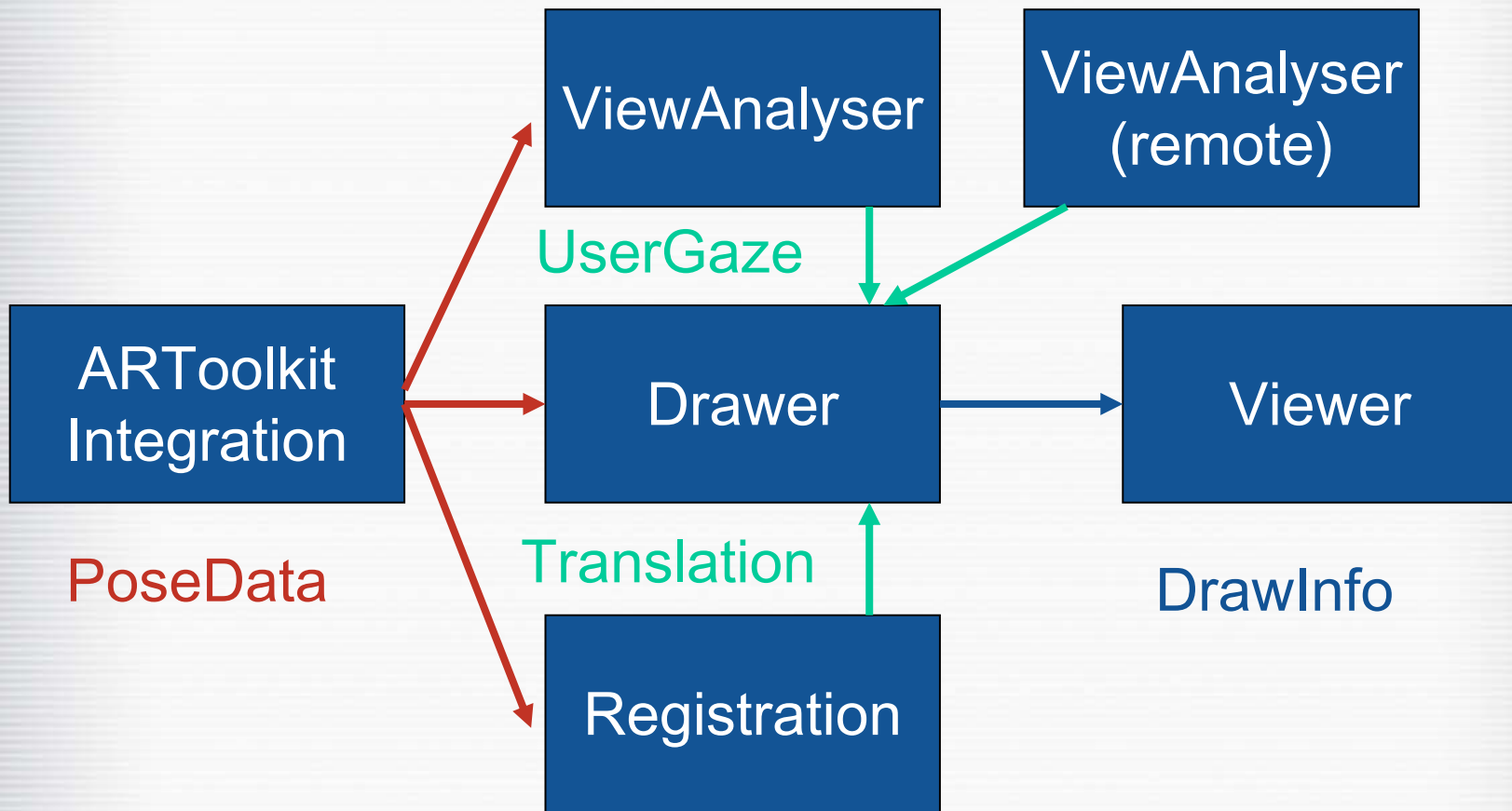
- registration between markers is necessary
 - imagine only one marker is visible
 - but you have to rotate the avatar



Drawer

- retrieve different kinds of information
- combines them to a scene
- and controls the Viewer component

architecture overview



Thank you

- any questions???