



University of  
Zurich <sup>UZH</sup>

Department of Informatics

# Examples of Multiple-Site Conferences and Video Lectures

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# Part I:

## The First World Resources Forum (WRF) with >500 Participants in Davos and Nagoya



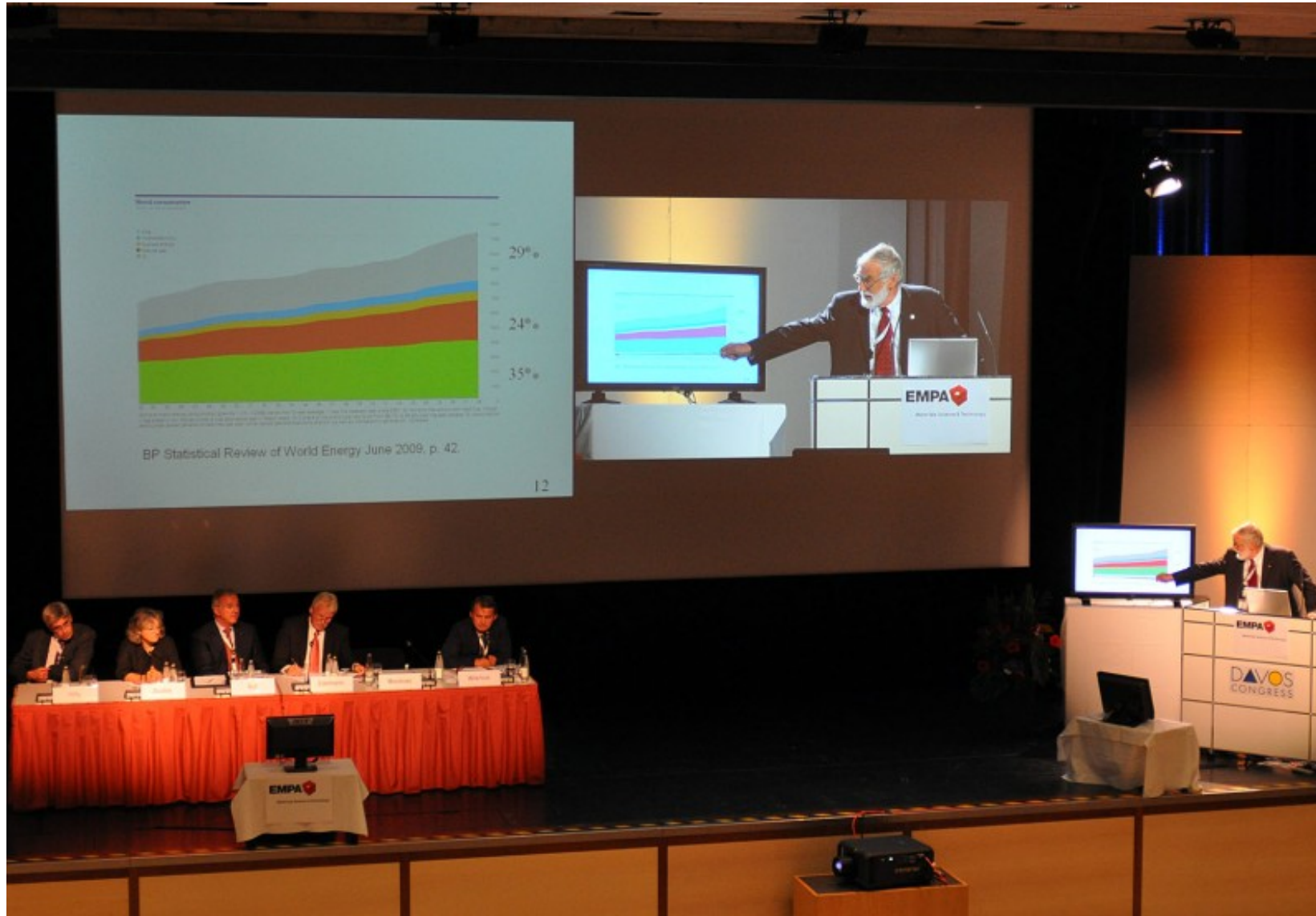
Davos



Nagoya



# Not only transmitting speakers and presentations...



Dennis Meadows  
speaking in Davos.



...but also making the remote audience visible in life-size





# Enabling eye contact between speaker and remote audience



It is essential for speakers to see whom they are talking to and to receive non-verbal cues from the audience.



# Enabling informal communication during breaks



Telepresence kiosks placed in the coffee break and lunch/dinner areas were used for discussion and for fun.

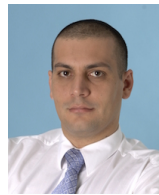
# Research triggered by the Davos/Nagoya case

...about participants' reactions  
to this conference format



In this case, the new  
format avoided **70-80  
intercontinental flights**  
and was well accepted  
by the users

Coroama, V. C.; Hilty, L. M.; Birtel, M.: Effects of Internet-Based Multiple-Site Conferences on Greenhouse Gas Emissions. *Telematics and Informatics* 29 2012, 362-374



Vlad  
Coroama  
(Empa/ETH)



Martin  
Birtel  
(Empa)



Ernst  
Heiri  
(SWITCH)



Frank  
Horn  
(Cisco)

...about the energy demand of  
Internet data transmission



Internet energy  
intensity was about  
**0.2 kWh/GB**  
transmitted

Coroama, V. C.; Hilty, L. M.; Heiri, E.; Horn, F.: The Direct Energy Demand of Internet Data Flows. *Journal of Industrial Ecology* 17 (5) 2013, 680-688  
DOI: 10.1111/jiec.12048

Coroama, V. C.; Hilty, L. M.: Assessing Internet Energy Intensity: a Review of Methods and Results. *Environmental Impact Assessment Review* 45 (2014) 63-68 DOI: 10.1016/j.eiar.2013.12.004

Coroama, V. C., Moberg, Å., Hilty, L. M.: Dematerialization through electronic media? In: Hilty, L. M.; Aebischer, B. (eds.) *ICT Innovations for Sustainability. Advances in Intelligent Systems and Computing*, vol. 310, pp. 405-421. Springer, Switzerland (2015),  
DOI: 10.1007/978-3-319-09228-7\_24



## Comparison in terms of CO<sub>2</sub> emissions

By applying the new conference format, we **avoided 70-80 intercontinental flights.**

Flying from Zurich to Nagoya and back:  
**3.6 tons of CO<sub>2</sub> per person**

Videoconferencing, 3 x 8 hours, 8 full HD channels:

**<<1.0 ton of CO<sub>2</sub>**

for all >500 participants together.



# 10 basic requirements to improve user experience in virtual communication

1. Everyone **who is speaking** can **see who is listening**.
2. **Nonverbal cues** work: gestures, facial expression, gaze...
3. Everyone can easily **point** at objects that are presented.
4. End-to-end **delay** is below 150 ms.
5. The **sound** is clear and in perfect sync with picture.
6. All venues are free of **background noise** unless the technology can handle that.
7. The technology is **unobtrusive** (full attention can be devoted to content).
8. The technology is **intuitive**, no preparation or prior knowledge is necessary for participants.
9. Participants **feel in control** of the technology.
10. The **reliability** is at least as high as in aviation.



# How do we get there?

## Three principles of videoconferencing support

### 1. **Avoid technological paternalism:**

Styles of work and communication are individually different – to support users means to respect their individual preferences.

### 2. **Avoid lock-in effects:**

Keep technology as open and flexible as possible and avoid locking in users into specific platforms or business relations to providers in the long run.

### 3. **Provide a reliable service:**

As in air travel, it is essential to provide a perfectly reliable service, not just an infrastructure.



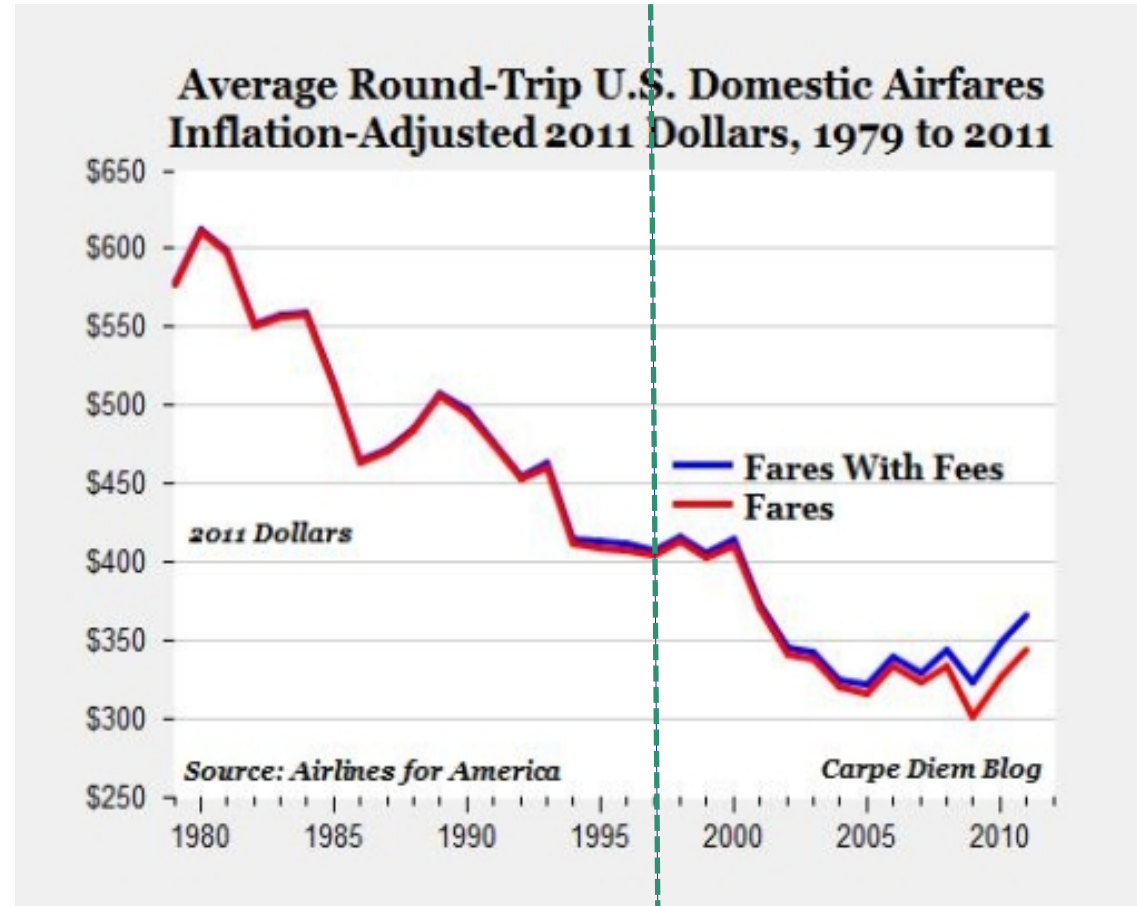
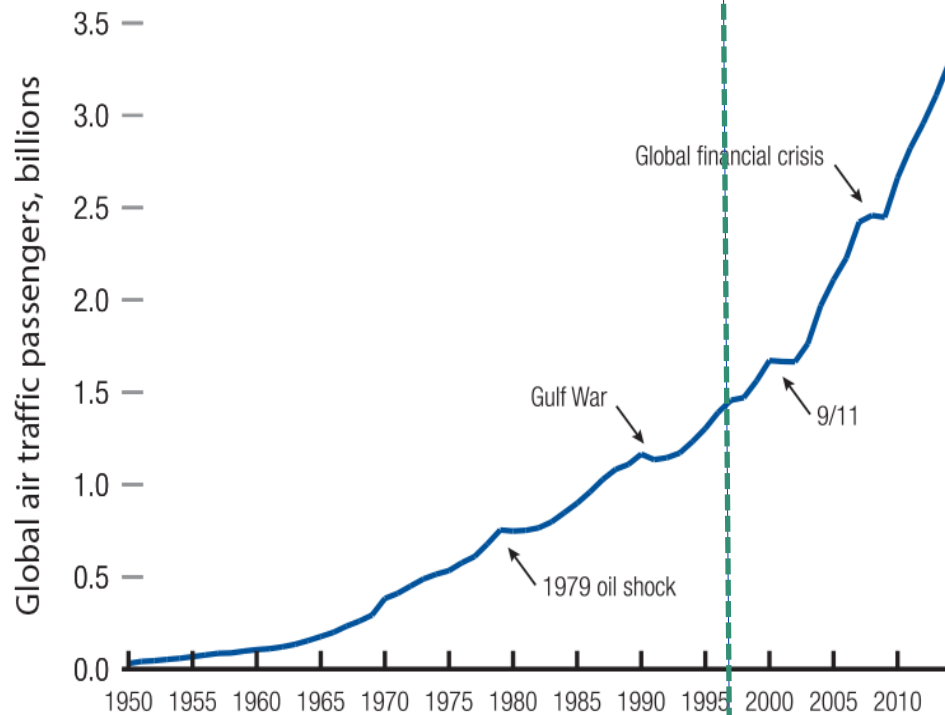


# Was there no excellent research 20 years ago

...when the world saw only half of today's air travel and air fares were much higher



Figure 1: Global air passenger traffic trend, 1950-2014  
(IATA Forecast for 2014)





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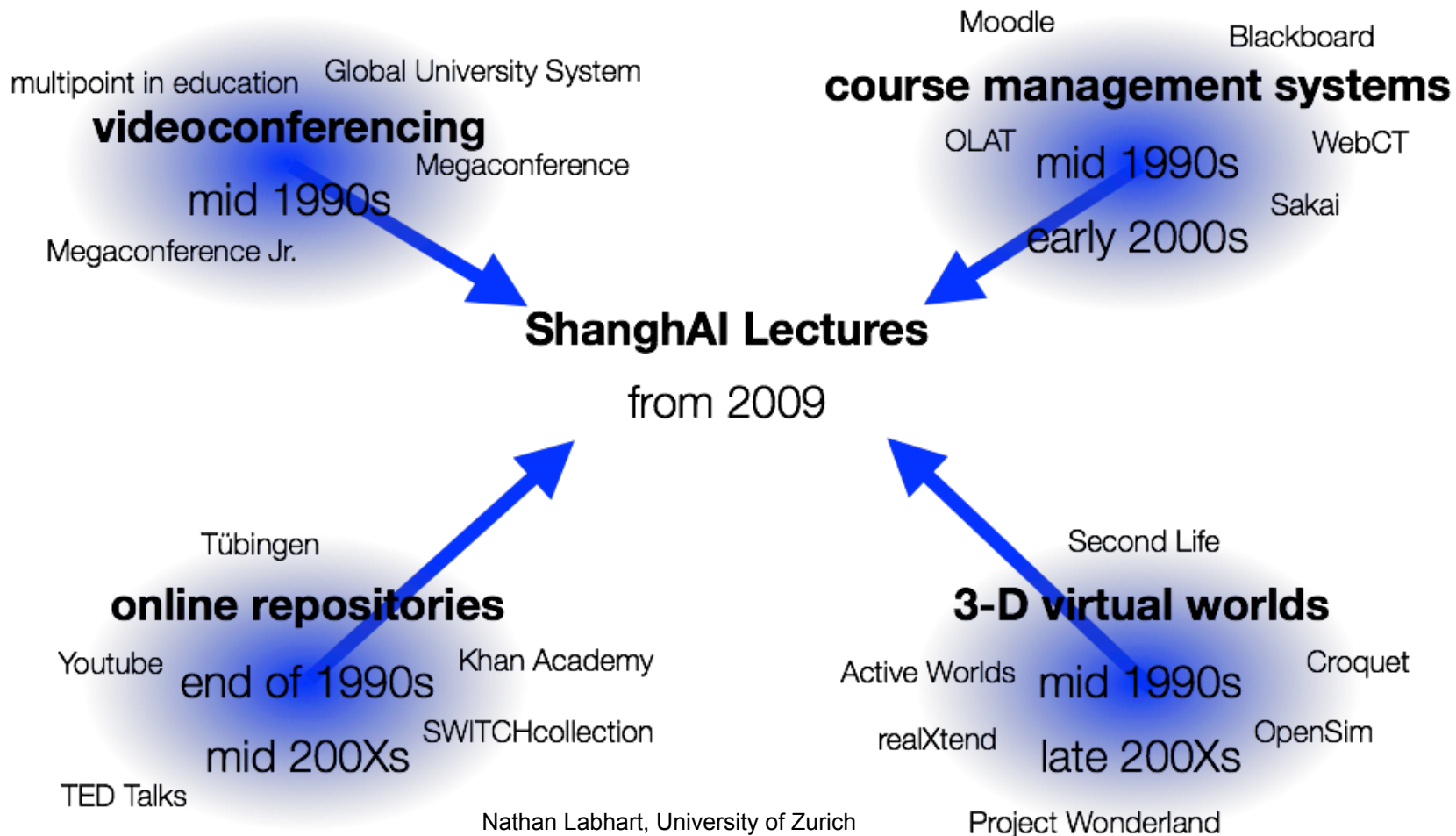
# Part II:

## The ShanghAI Lectures: Connecting Classroom Communities in Cyberspace



# What are the ShanghAI Lectures?

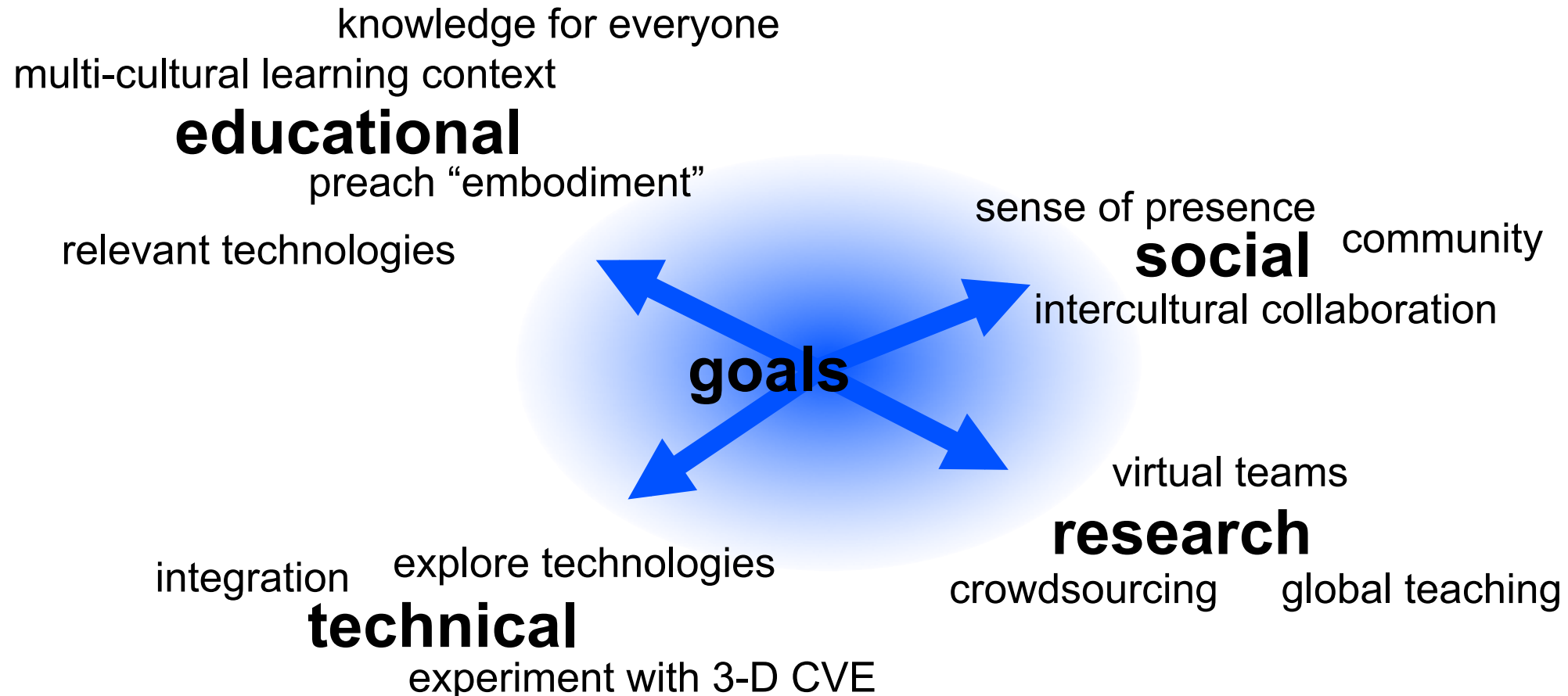
Interactive lecture series via videoconference + website + optional three-dimensional collaboration platform





# What are the ShanghAI Lectures?

Interactive lecture series via videoconference + website + optional three-dimensional collaboration platform



# The Lectures

**Natural and Artificial Intelligence + Robotics**

**Shanghai Jiao Tong University + University of Zurich**

**12–15 universities/classrooms**

**Main lecture series: Prof. Rolf Pfeifer (UZH)**

**Guest lectures (academia, industry)**

**Student presentations**

**H.323 videoconferencing + Adobe Connect**

**Recording (SWITCHcast)**

**October to December, Thu 9:00–11:00 CE(S)T**

# Connection Setup

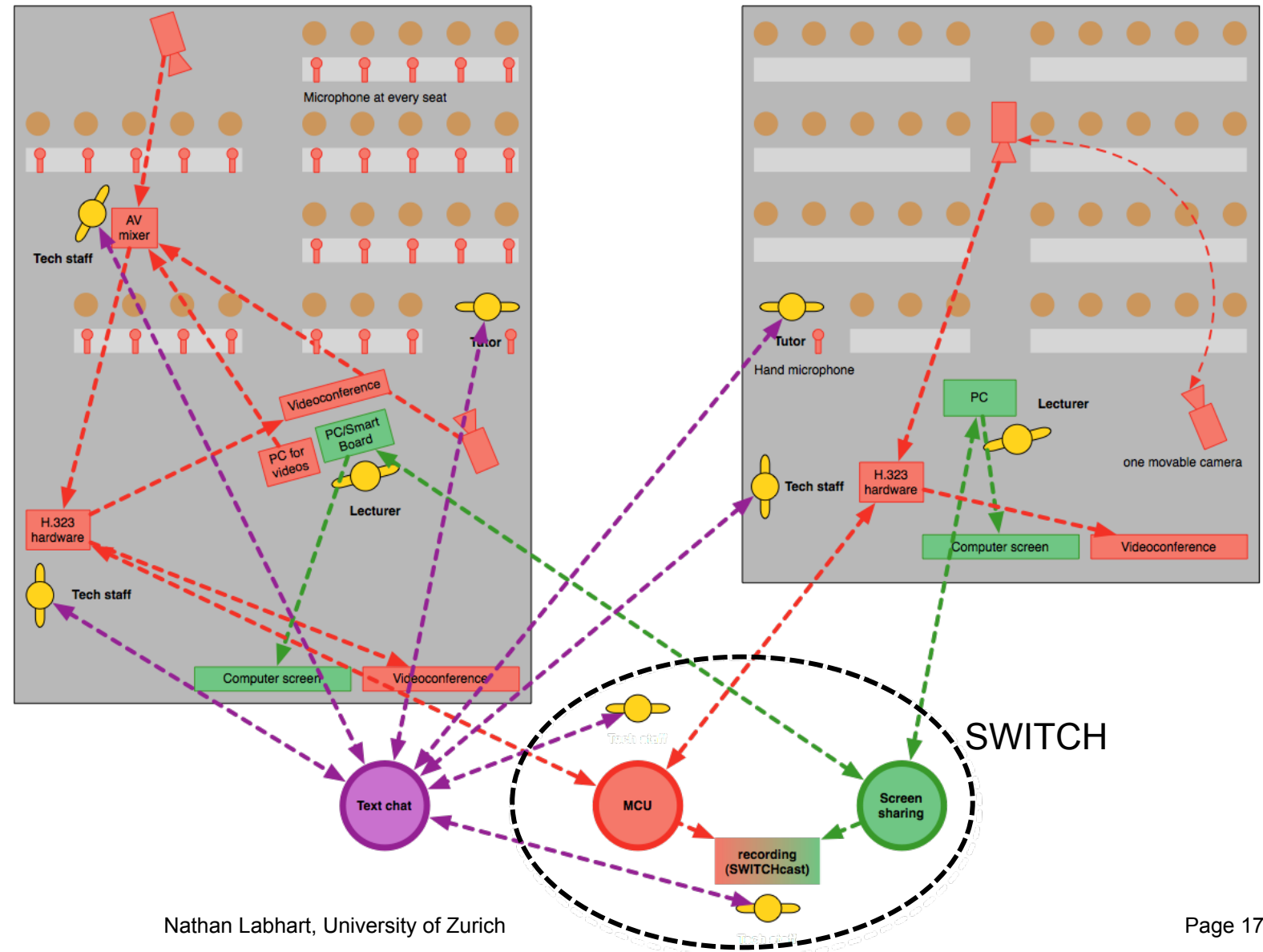
Three channels:

- Videoconference
- Screen sharing
- Background chat

Recording:

- Videoconf + Screen

Example: 2 lecture halls





# Connection Setup



Lecture hall at Shanghai Jiao Tong University



Lecture hall in Zurich

Involved Sites since 2009: 50+



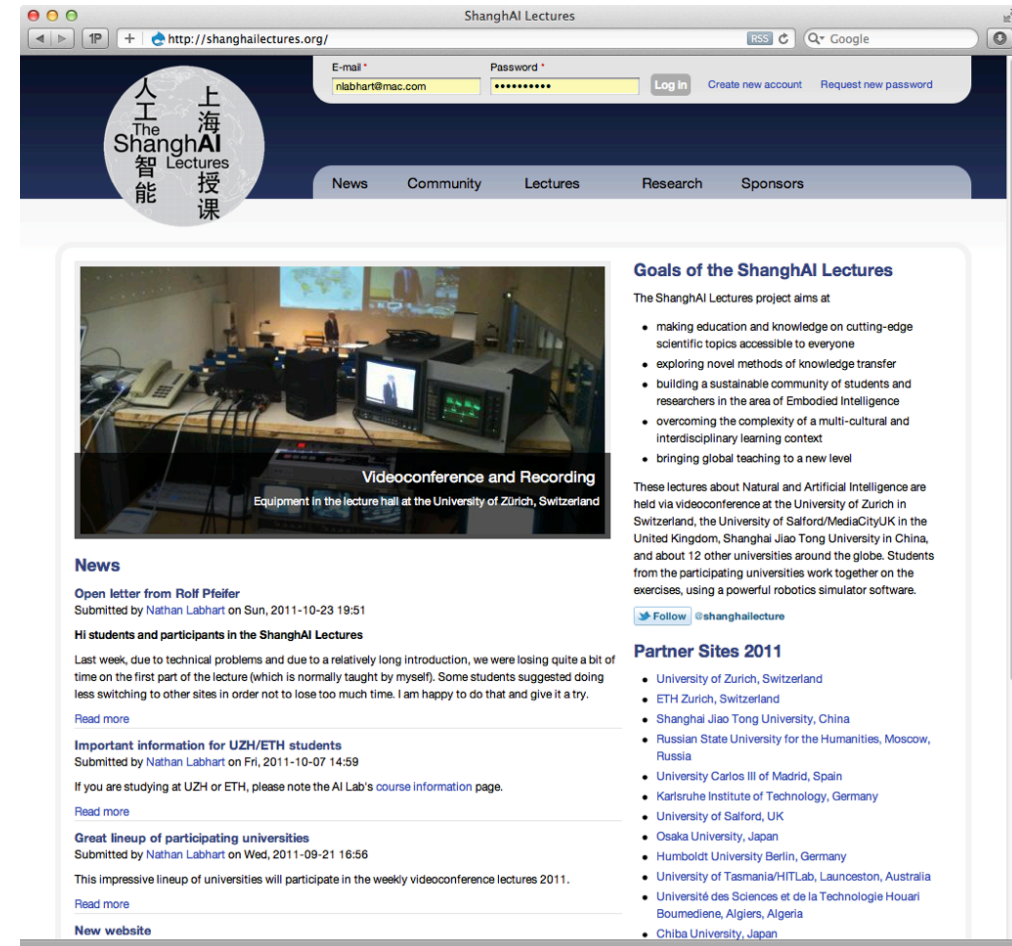


# The Website



Online Community (no FB, G+, ...)  
Handouts, recordings

25.09.17



Repository of all lectures and guest talks  
Live chat

Nathan Labhart, University of Zurich

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# 3-Dimensional Collaborative Environment “UNlworld”



## Purposes:

- Complementary to videoconf
- Experiment
- Research platform
- Group exercises
- Community building

## Technology:

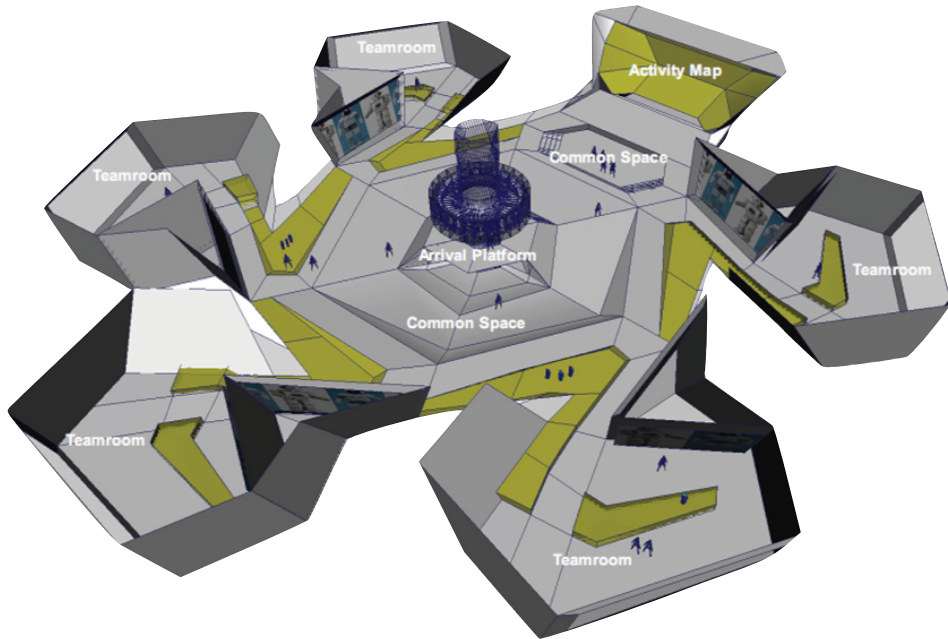
- Open Wonderland (Java)
- Avatars, 3-D objects (robots), collaboration tools (OpenOffice)



# UNIworld Design

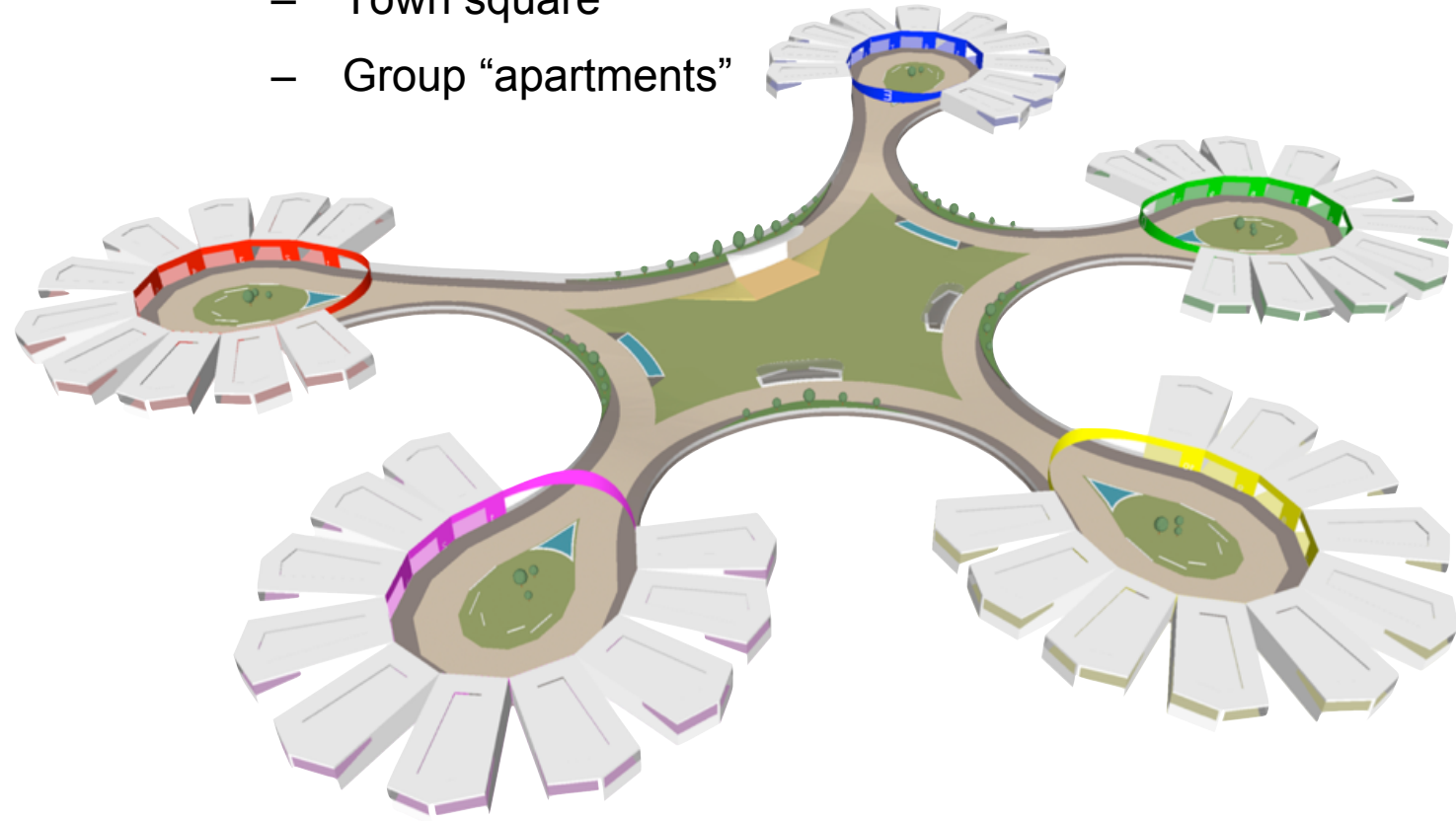
## Small world 2009

- Presentation stage
- Preparation rooms



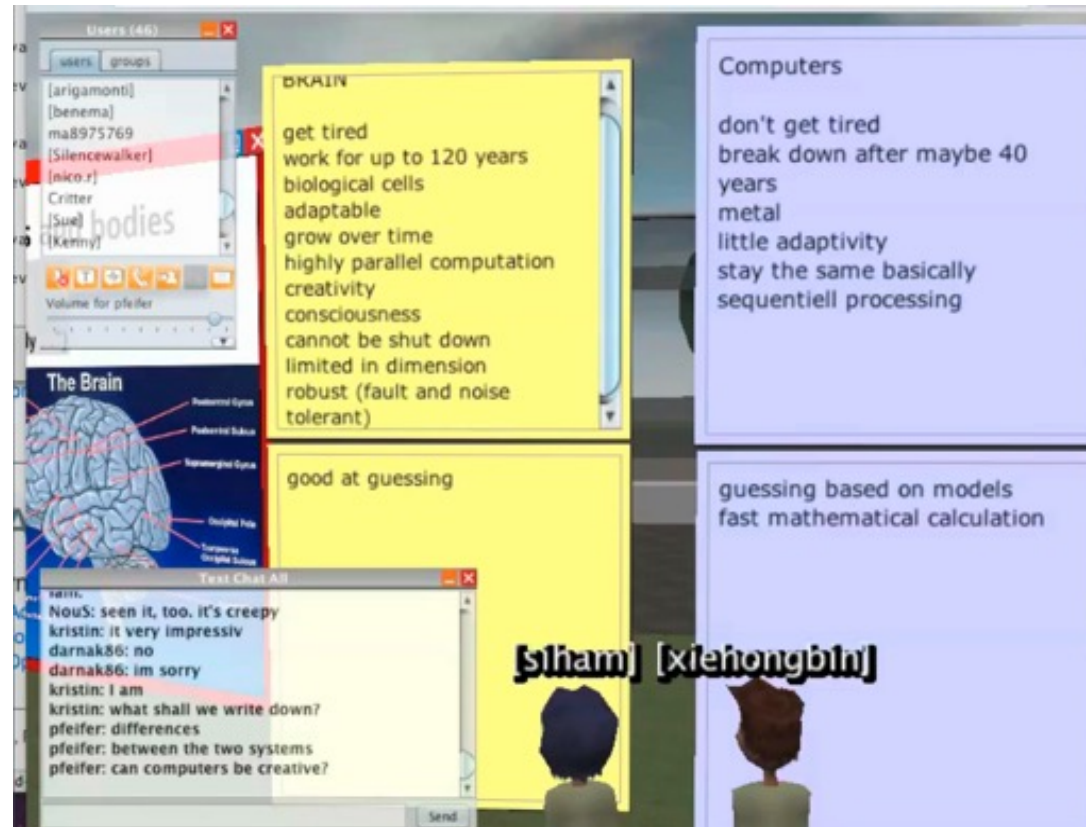
## Large world 2010

- Presentation stage
- Town square
- Group “apartments”



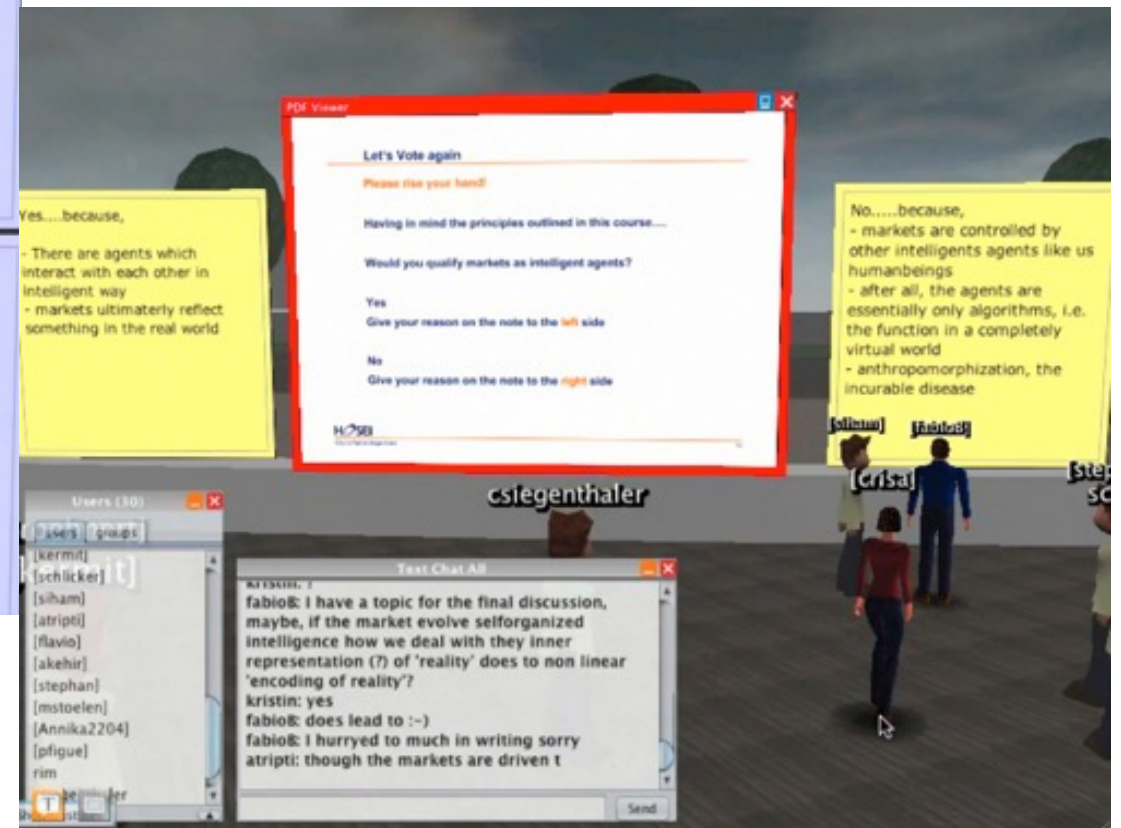
Design: HENN StudioB/Andreas Schmeil

# UNIworld: Discussion Sessions



Post-Its: anonymously add comments

Vote with your feet



## Key Results

### Success Factors:

- Lecture concept
- Enable anyone to attend lectures
- High-profile speakers
- Collaboration, interactivity
- Hands-on exercises
- Showcase

### Challenges:

- Time zones
- Lecture hall setups
- 3-D technologies
- Costs, efforts
- Local regulations
- Different academic levels