Distributed Eye Tracking Network for Conveying Gaze of Remote Users in a Robotic Telepresence Scenario

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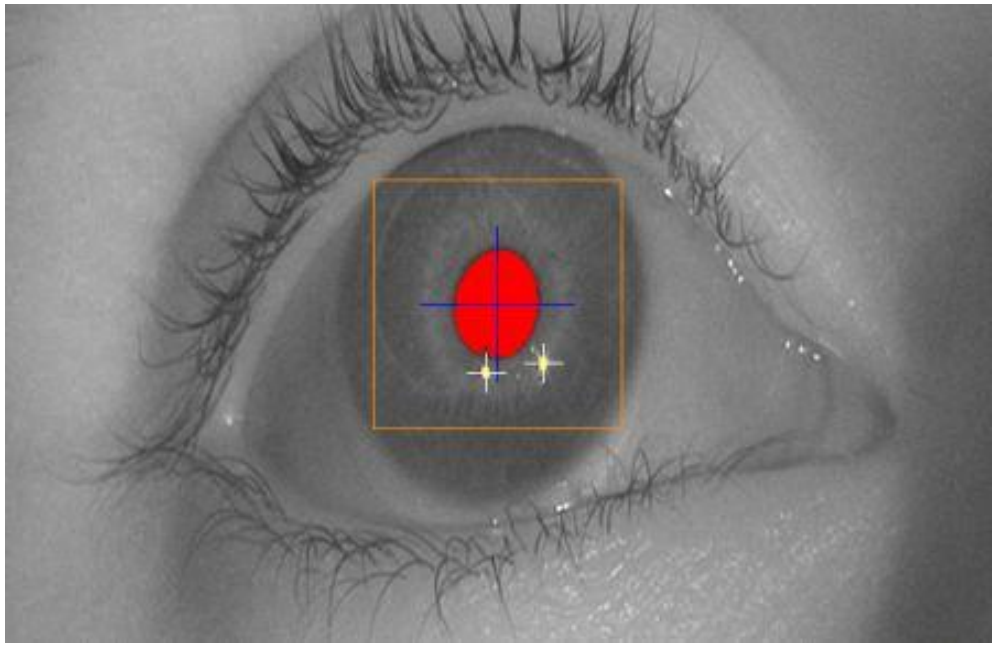
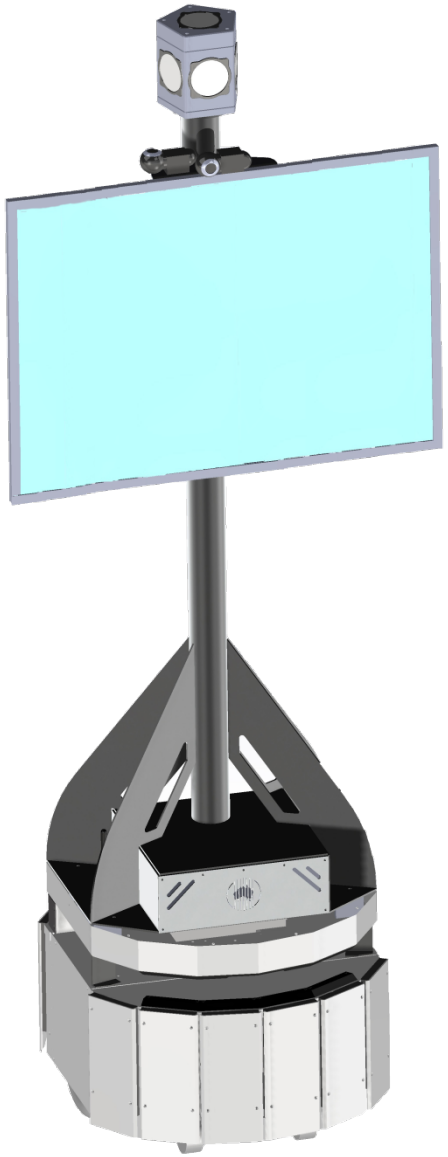
Introduction

- Remote robotic telepresence system to visit a museum
- Panoramic camera on robot gives remote users immersive view
- Limitation of current telepresence systems
  - Humans around robot unaware of where remote users are focusing attention
  - Contrasts with physical presence: body language provide hint of gaze points
- Distributed network of eye trackers to monitor gaze behaviour of multiple users to collect information of where remote users are looking
- Gaze information is then superimposed into a condensed representation of the panoramic image.
  - Visualization of remote visitors' gaze behaviour provides feedback to the museum tour guide about their audiences areas of attention

Technology Fusion





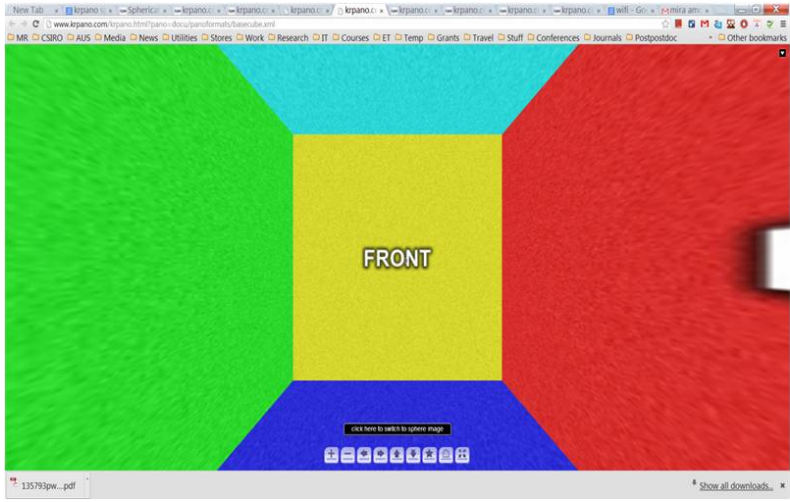
Panoramic Camera

Lady Bug

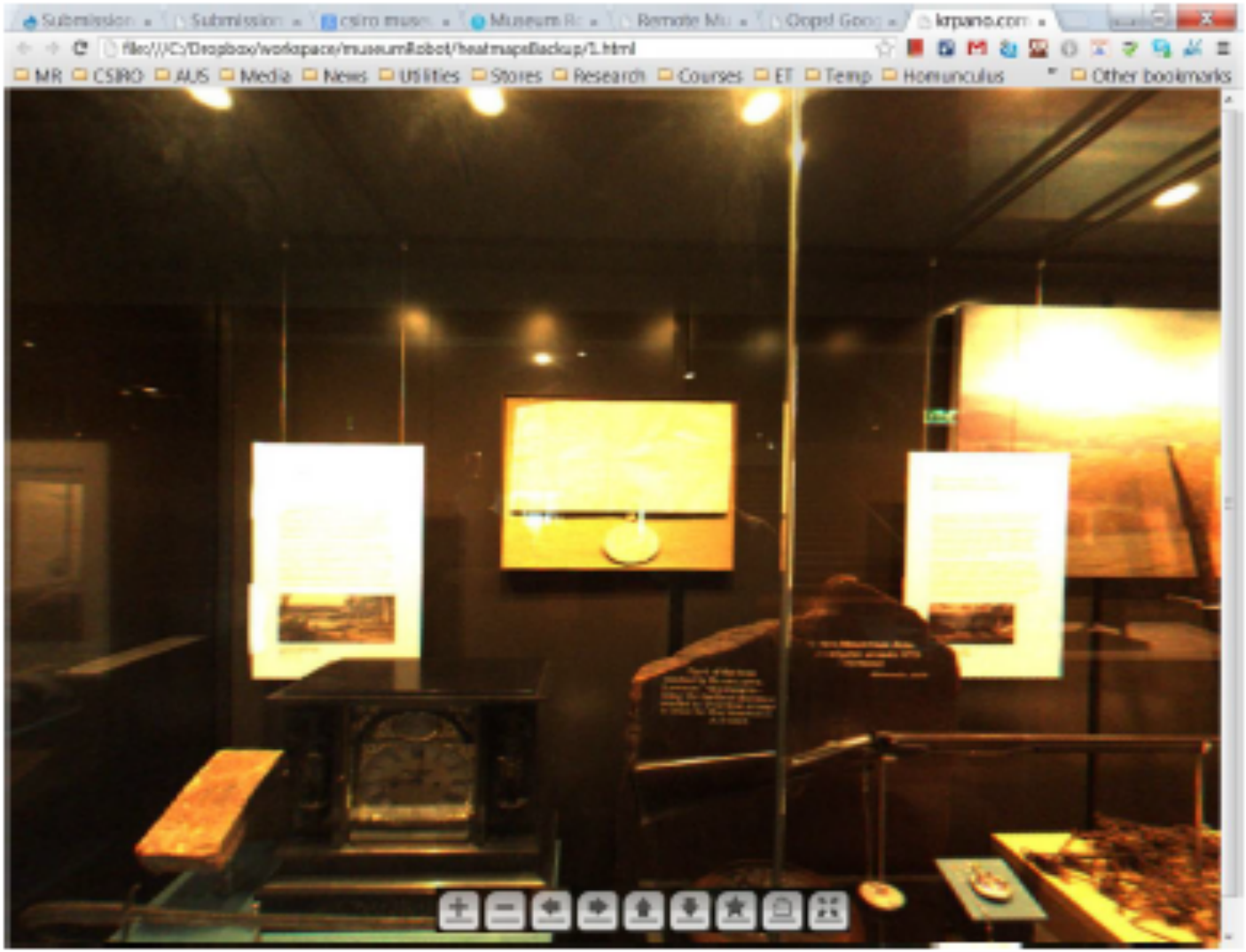
Several cameras facing different directions to create a panoramic image of the robot's surroundings (360º by 140º field of view)

Panoramic Image Viewer

- Krpano
- Works within a web browser
- Six individual images stiched into a fixed spherical panorama
- Mapped onto a rectangular image using an equirectangular projection



Panoramic Viewer in Remote Browsers

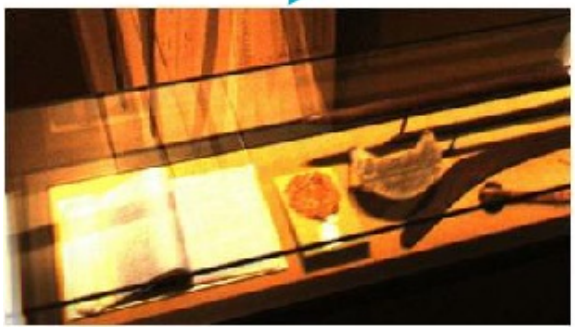


Tobii X2-30 Eye Tracker

- 0.5 Degree Accuracy
- 30 Hz
- Low Cost
- Robust
- Portable

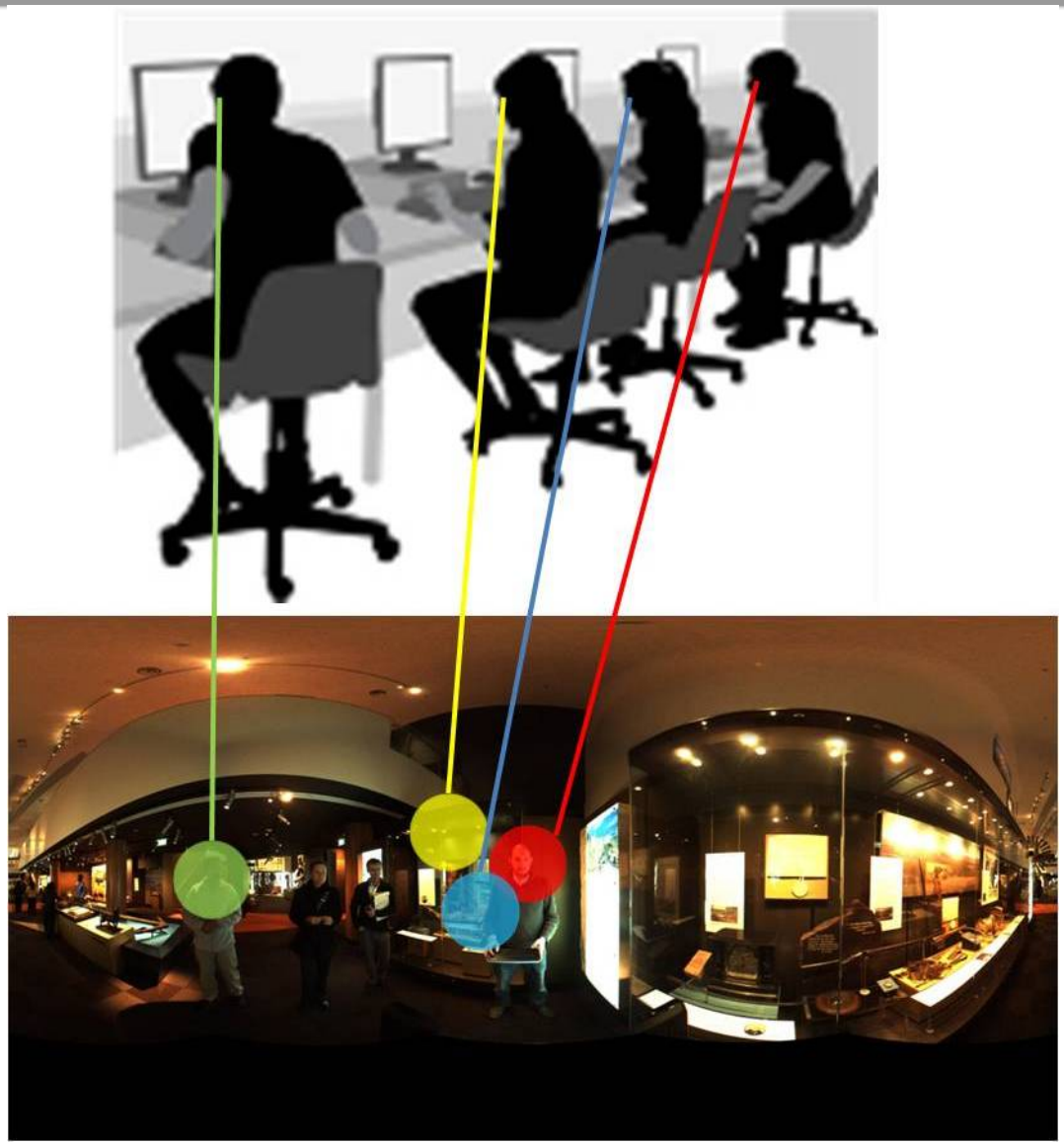
OmniDirectional Panoramic Image Representation

Student 1's view



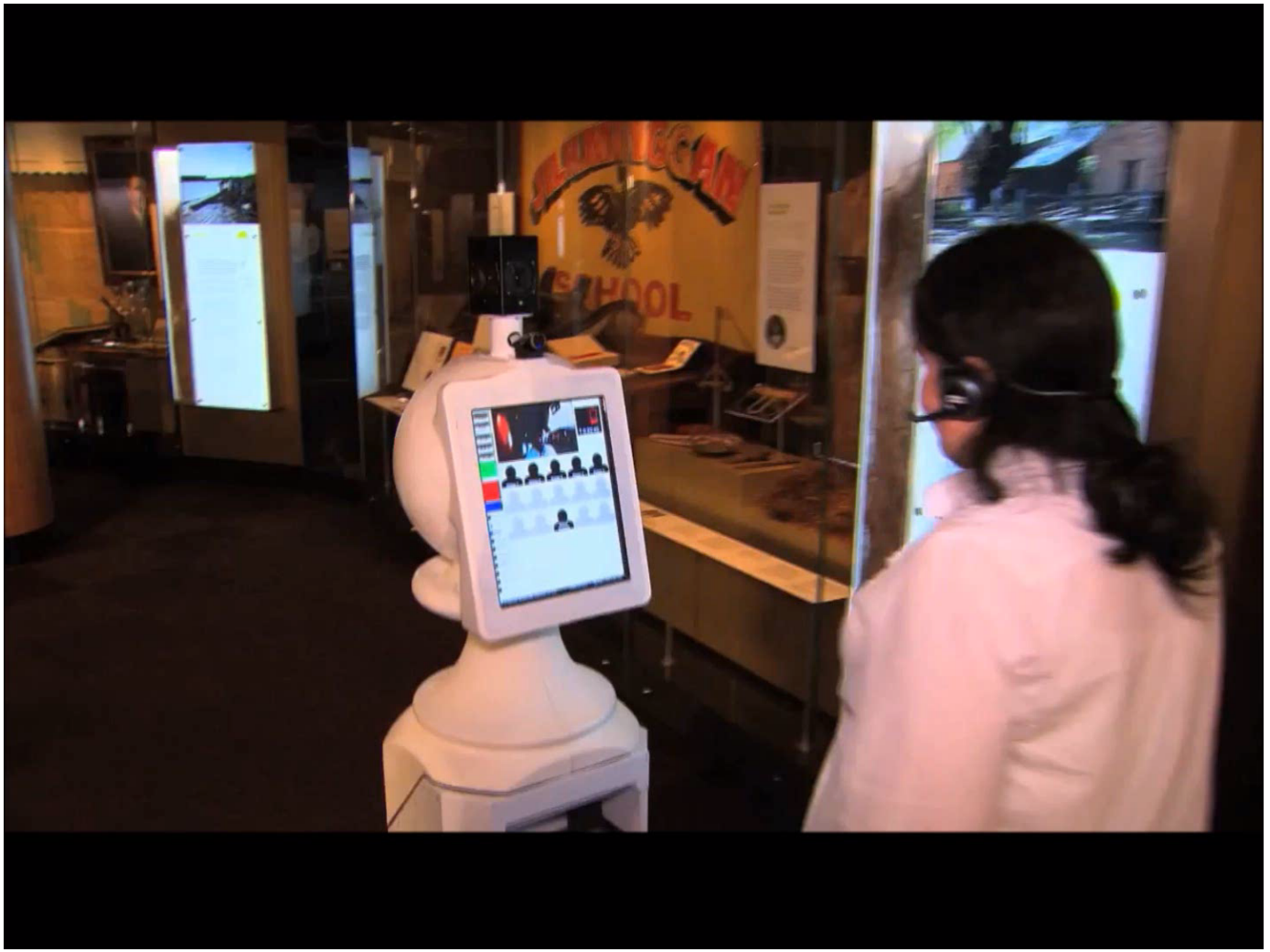
Student 2's view

Eye Tracking Network



Eye Tracking Network

Video



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Thank you

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