Human Media Interaction

Estimating the Gaze Point of a Student in a Driving Simulator

Human Media Interaction

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Human Media Interaction

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- The Driving Simulator
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The Driving Simulator

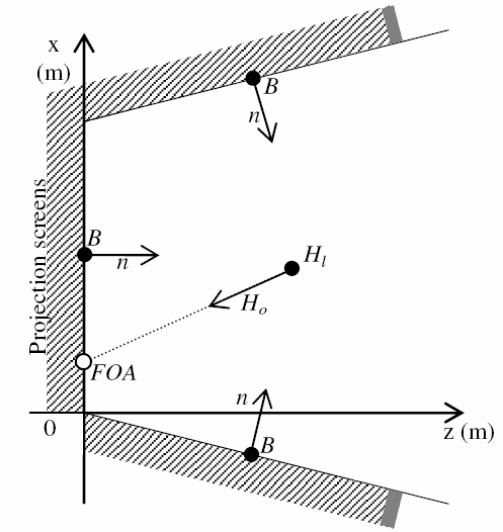
- "De Nederlandse Rijsimulator" (DNR)
- Training of driving procedures
- Predefined curriculum
- Aims to maximize learning moments

The Driving Simulator

- **Preparation** for practical lessons!
- System autonomous **during** lessons
- Virtual Driving Instructor (VDI)
  - Audiovisual (positive and negative) feedback
  - Feedback based on input from car controls
- VDI cannot yet substitute human instructor in full during simulator lessons
  - Gaze behavior should be evaluated
  - Body poses should be evaluated

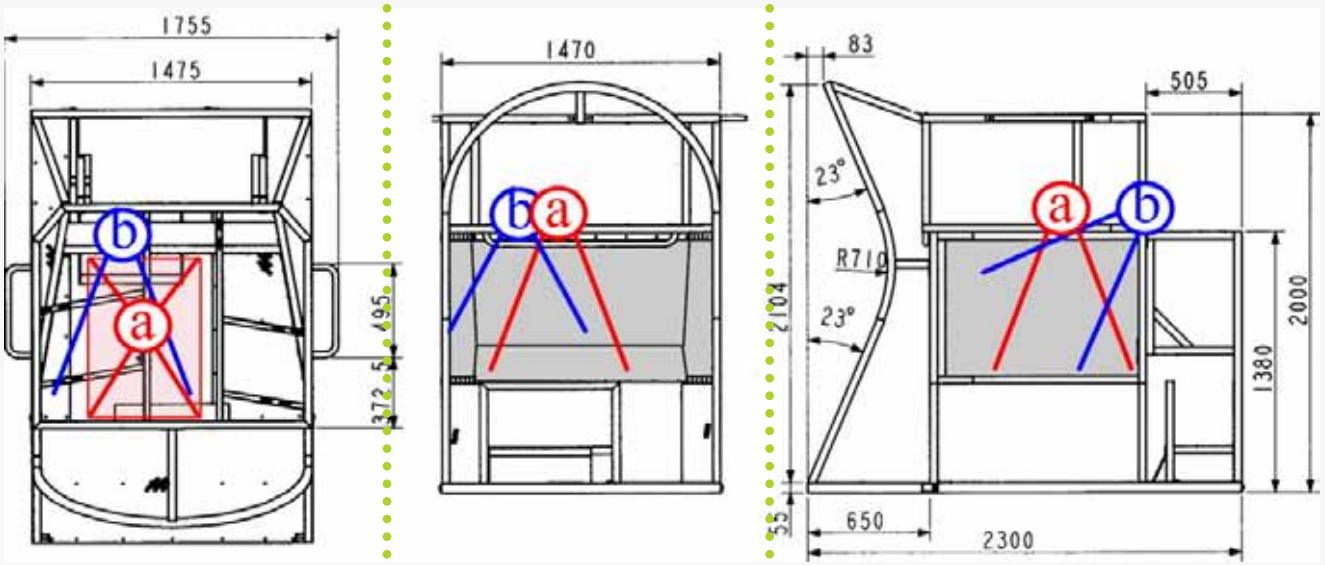
Observing Students

- Aim: improving learning experience
- Focus on estimating gaze direction
  - Head location
  - Head orientation
  - Eye orientation relative head orientation
- Requirements:
  - Unobtrusive
  - Low-cost
  - Off-the-shelf

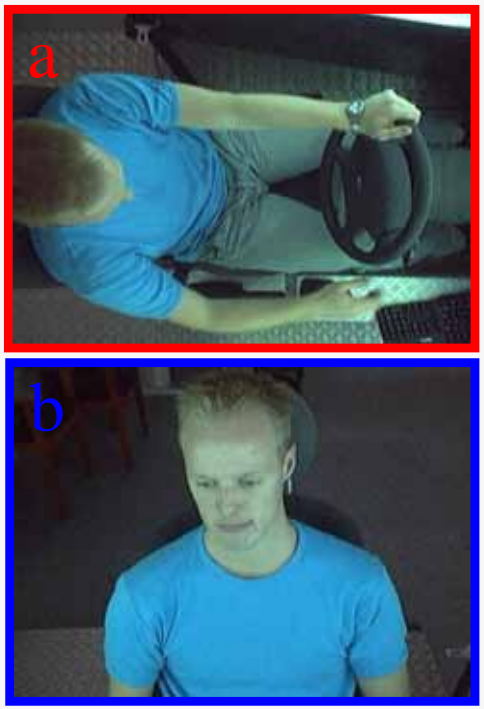


Observing Students

- Depth information required
- Minimal camera solution

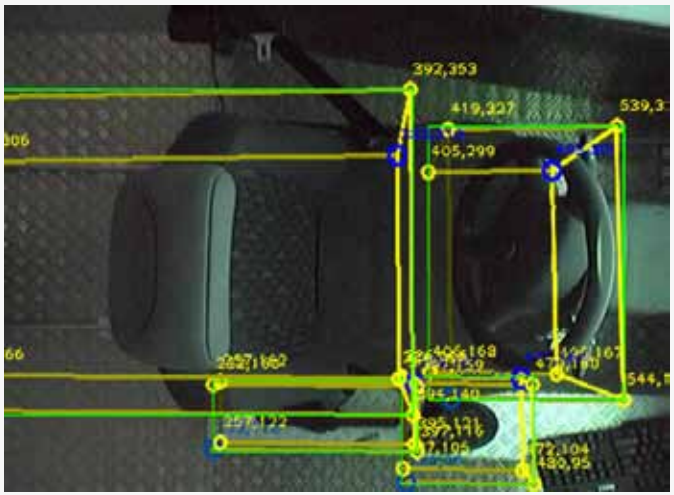


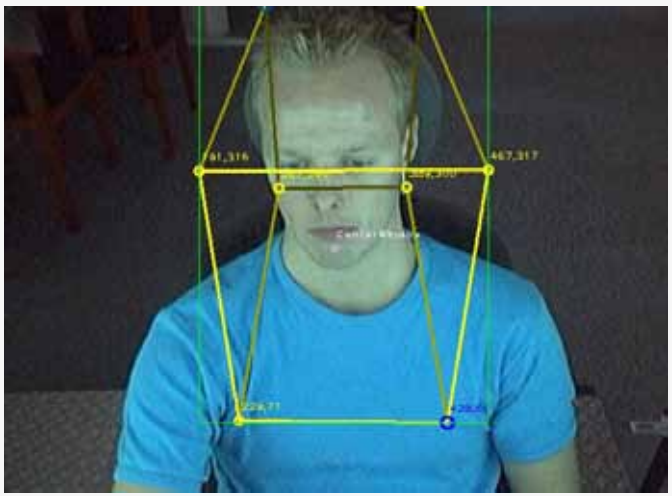
top front (right) side



Capturing student actions

- **Image cropping**
- Color correction
- Skin color detection
- Facial feature extraction
- Feature constellation matching





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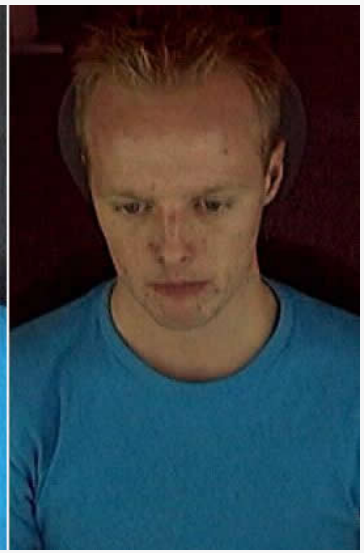

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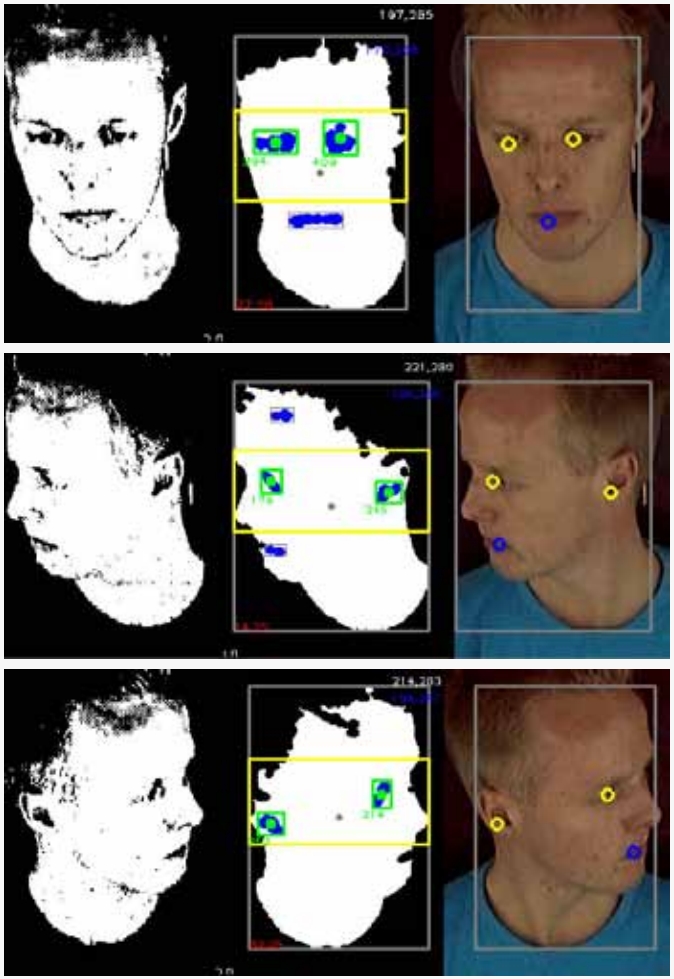

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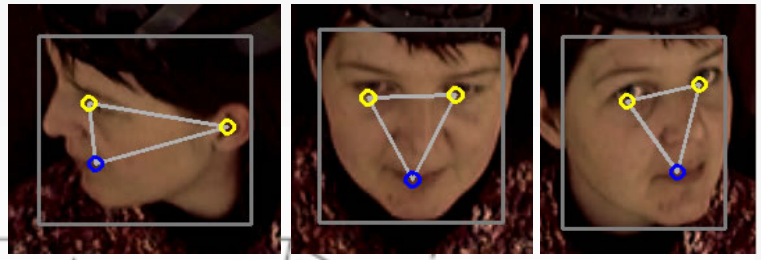

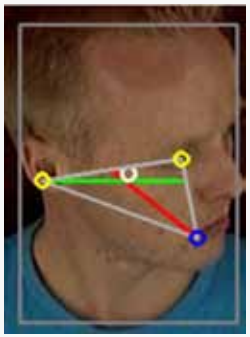

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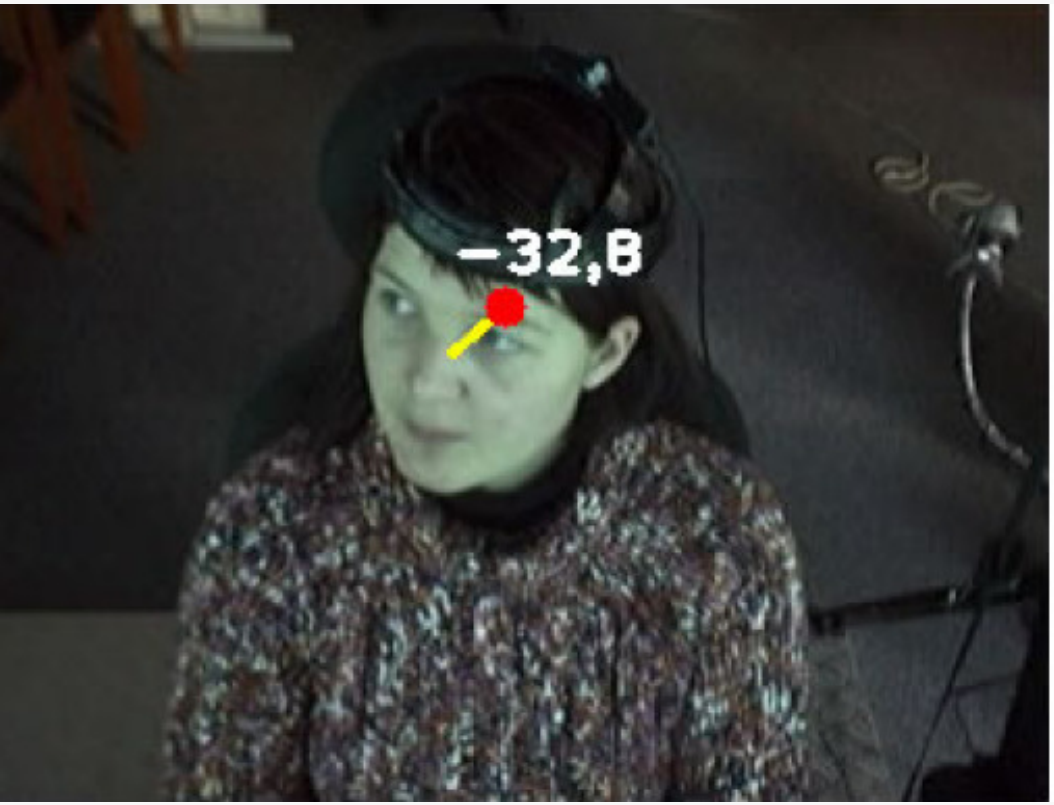

Towards behavior analysis

- Gaze patterns can be identified
- VDI can provide feedback on (in)correct gaze behavior
- Body poses can be estimated similarly
  - Detecting other features

Also refer to:

- **http://hmi.ewi.utwente.nl**
- **http://www.greendino.nl**

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Questions