DSC 2024 EUROPE VR

Driving Simulation & Virtual Reality Conference & Exhibition

18-20 SEPTEMBER 2024

Palais de la Musique et des Congrès, Strasbourg | France

CONFERENCE OPENING

13:45 **Dr. Andras Kemeny** : *XR Based Driving Simulation And Virtual Reality*

DSA | Renault Group | Arts et Métiers | Université Gustave Eiffel | SIA Société des Ingénieurs de l'Automobile | AVSIMULATION | cruden | dSPACE | FKFS Research in Motion | System X | ASAM

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DSA Organization Committee

Conference conclusion

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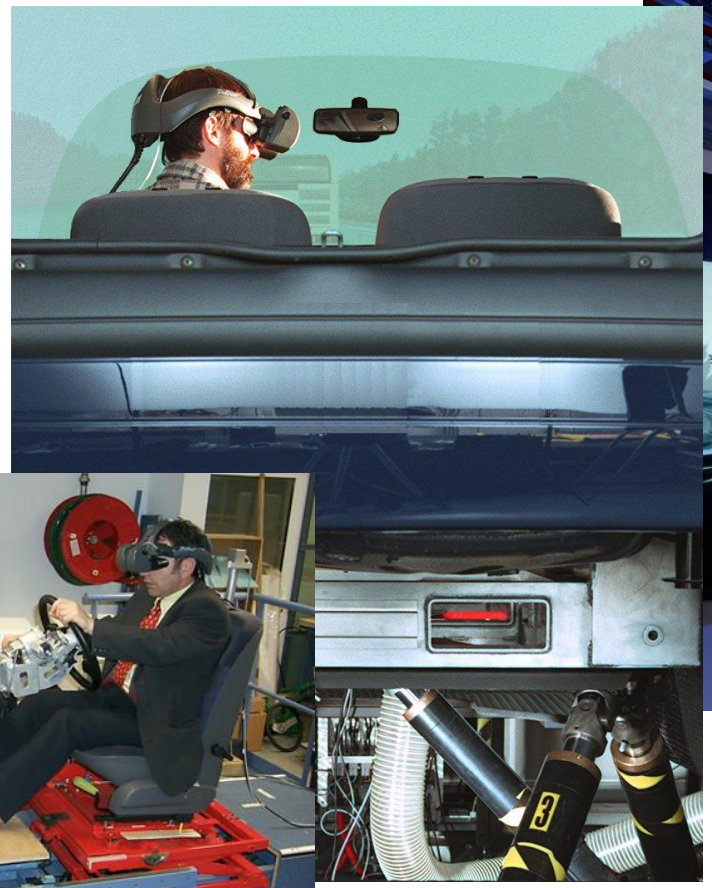
DRIVING SIMULATION AND VR EMERGING BOTH IN THE 1960S

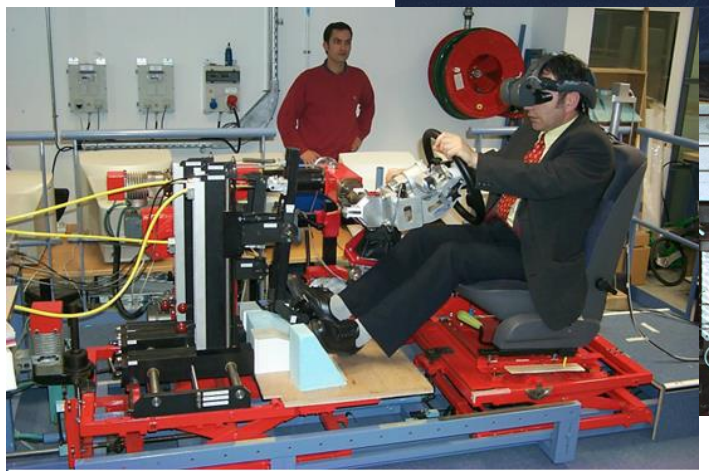
Doron Electronics driving simulators in the 1960s

VR headset proposed by Sutherland in 1968

Kemeny, A. "From driving simulation to virtual reality." *Proceedings of the 2014 virtual reality international conference*, Laval, 2014.

FROM THE 90S TO TODAY'S DRIVING SIMULATORS



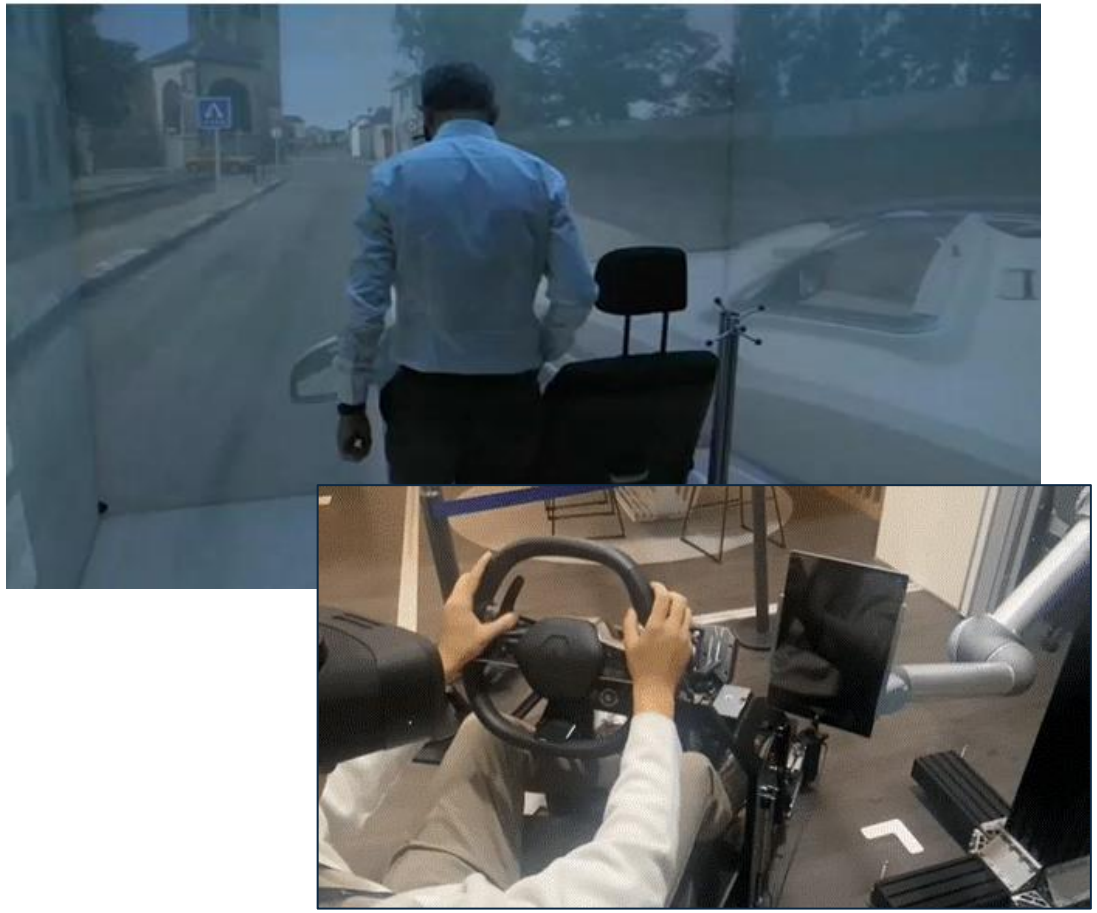


XR based driving simulators at BMW, DLR and Renault

see also Volvo and VW, DSC Europe 2024 VR

VR & DRIVING SIMULATION TECHNOLOGIES & DIFFICULTIES

- Virtual reality
  - Computer generated images
  - Interactive
  - Sensory feedback
  - Physical and mental immersion
- Same software & display technologies, same difficulties
  - Proprioceptive cues
  - Computational lags
  - 3D vision scale 1:1 perception and computational load
  - Haptics rendering
  - Cybersickness



AR BASED IN-CABIN AND OCCUPANT DISPLAY SYSTEMS

ADAS and AD HMI Systems
- slower driver reaction time to resume control vs. driving[1]

Functional safety, road & traffic hazards
- weather, road infrastructure, traffic

Self-driving cybersickness
- augmented driver/passenger in-cabin HUD/AR systems
- emerging issue for AD/ADAS systems
- solutions on the market/registered patents (Antwerps Blauw, Faurecia, General Motors, JLR, etc.)

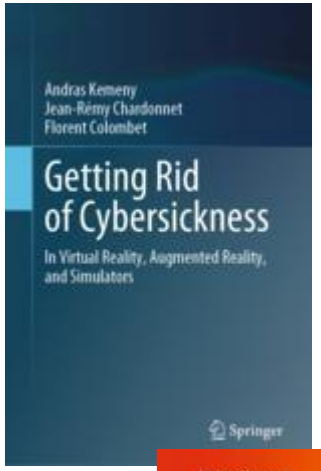
Automotive AR & VR market
- $ 674 billion by 2028[2]
- MEMs systems, both for ADAS/AD and AR

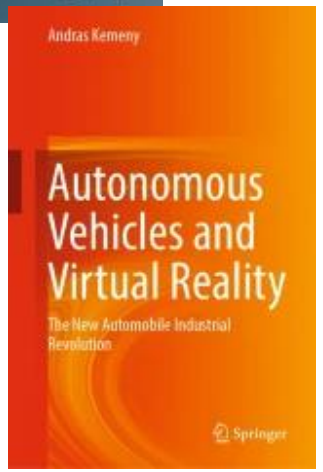
Waveguide-based AR technology
- HUD, HMD and AR glasses[3] (including bi-focal glasses)

[1] Vollrath et al., 2011, Paulwelussen et al., 2104
[2] https://www.alliedmarketresearch.com/automotive-ar-and-vr-market
[3] https://www.embedded.com/new-xr-smartglasses-may-just-be-the-breakthrough-ar-vr-needs/

DRIVING SIMULATION ASSOCIATION & DSC EUROPE 2024 VR

- DSA - a non-profit association to promote driving simulation
  - since 2015
  - supports the driving simulation community
- Research experimentation & publications
- With a portfolio of :
  - AV Simulation applications: 3D AV Participative
  - Cybersickness software products and patents
  - Collaboration with Arts et Métiers Institute of Technology and VRISE
  - Introducing a new plugin to reduce cybersickness with VRISE
- Edition of scientific Journal: The Driving Simulation proceedings
  - Scopus indexing
- Organization of the DSC Europe VR conferences DSC 2023 Europe VR





DSC 2024 Europe VR organization

- Driving Simulation Association
  - DSC 2024 Europe VR Proceedings of the driving simulation conference
  - DSC 2024 Europe VR Product Solution Book
  - Driving Simulation Proceedings, Scopus indexed online publication
- In cooperation with
  - Renault, Art et Métiers, University of Gustave Eiffel and SIA
- With the sponsorship
  - AV Simulation, Cruden, dSPACE, ASAM, FKFS and SystemX
- Onsite and remote participation, using the DSC2024 online App
  - Re-diffusion – September 25th, 2024

DSC 2024 Europe VR program

- Scientific sessions
  - AD/ADAS
  - Motion control and cybersickness
  - Perception and human factors
  - Simulator design
  - Virtual Reality
  - Artificial Intelligence & Machine Learning

- Poster presentations
  - In the exhibition area

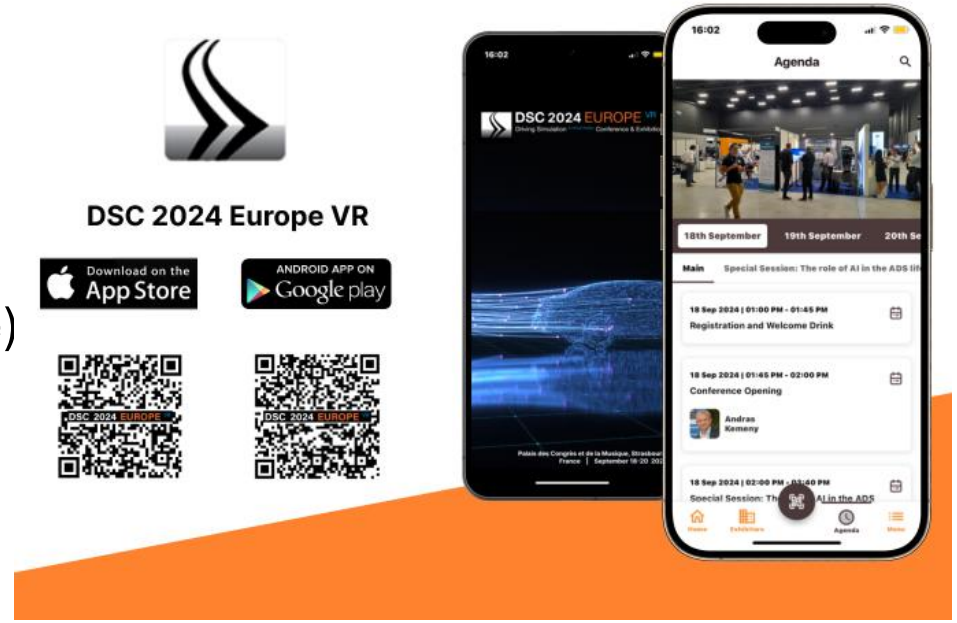
DSC 2024 Europe VR program

- Product solution sessions
  - AD/ADAS
  - DIL simulation & VR
  - Artificial Intelligence & Machine Learning
- Industrial Keynotes and Pitches
- Special Sessions
  - The role of AI in the ADS lifecycle
  - French ecosystem activities for AD deployment

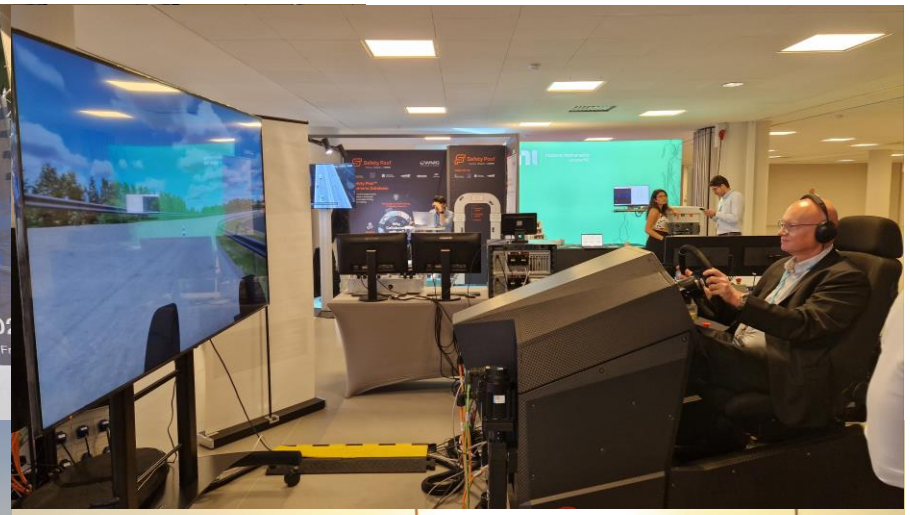
DSC 2024 Europe VR organization

- DSC 2024 Europe VR - a scientific and industrial innovation platform
  - 80 + Keynote, scientific, product solution, industrial pitch and poster presentations
  - Special sessions on *AI in the ADS lifecycle* & *French ecosystem AD deployment*
  - 40+ Exhibitors with cutting edge demonstrations and brand-new product presentations

- Hybrid conference 300 attendees
  - 2020 1/3rd physical, 2/3rd online
  - 2021 1/3rd virtual (only online), 2/3rd physical
  - 2022 ~ 90% physical (online app to inform & exchange)
  - 2023 back to pre-covid attendance with ~ 10% online
  - Wifi: DSCEurope2024 - Password : PDC092024



DSC 2023 Europe VR conference



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THANK YOU