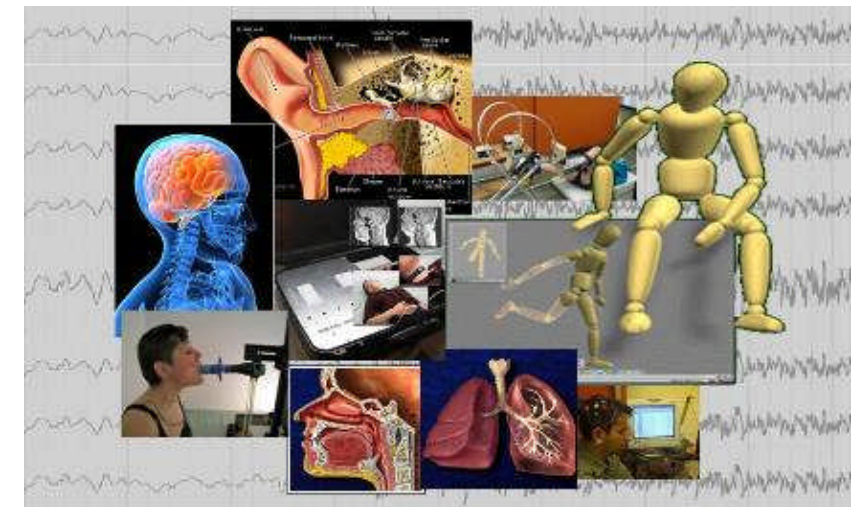


ComputationWorld 2025 & DataSys 2025, April 6-10, Valencia, Spain
**Special Session on “VR/AR/XR/MR Environments for Studying Functional Brain
Changes in Aging Population”**

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**University
of Manitoba**



BME INSTRUMENTATION, RESPIRATORY ACOUSTICS & BRAIN STUDIES **LAB**

Research Focuses

- Design of VR-based serious games as cognitive exercises, diagnosis of neurodegenerative dementia and monitoring treatment
- Alzheimer's treatment using magnetic and electrical stimulations
- AI-based Diagnostic Algorithms for obstructive sleep apnea detection
- Upper airway modeling



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Advancing Neurodiagnostics & Rehabilitation in Aging through Virtual Reality

- Addressing the needs of aging population, VR is emerging as a transformative tool for diagnostic purposes and therapy in both children and aging populations





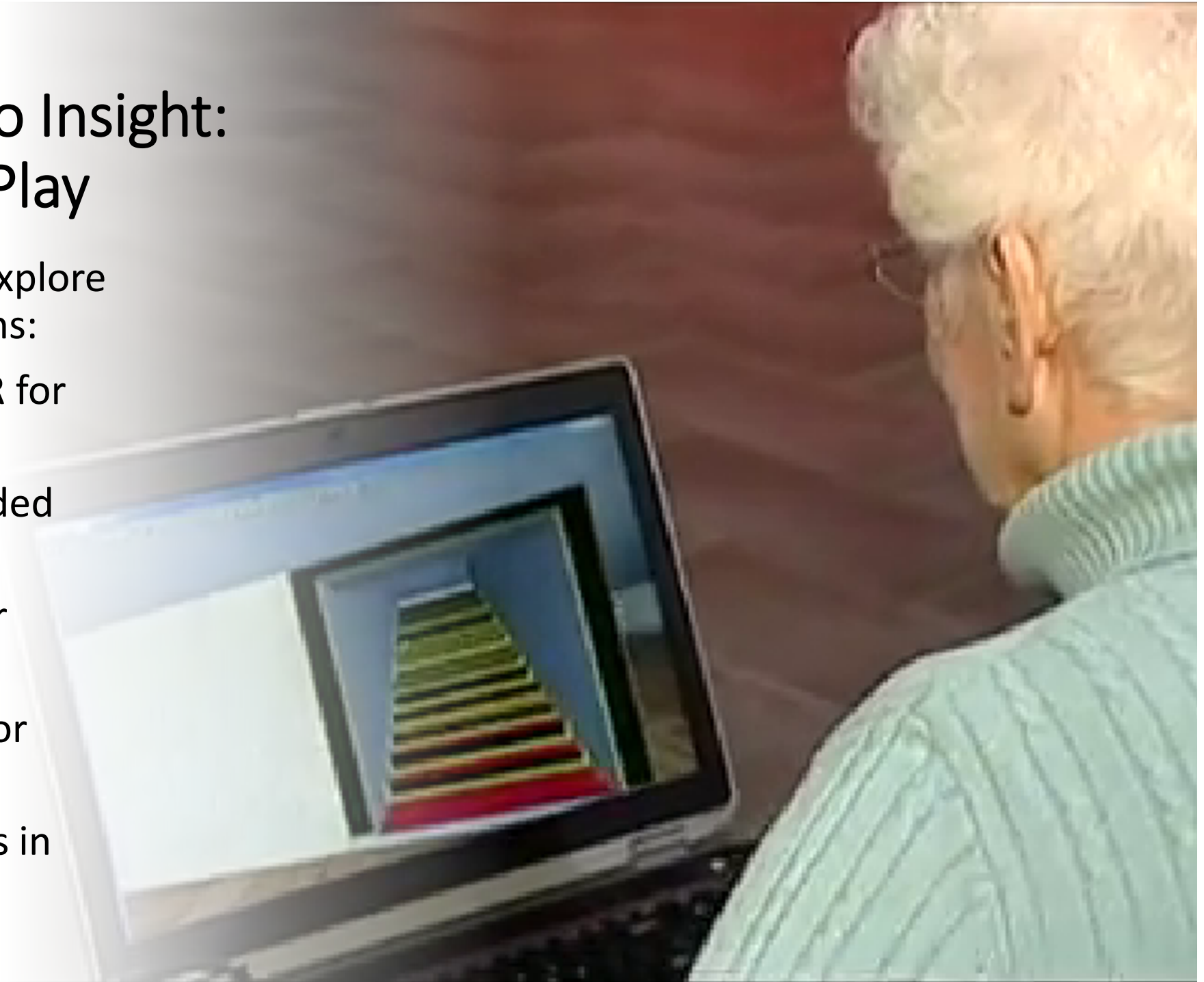
Why Focus on Aging & VR?



- Aging populations face challenges such as:
- Cognitive decline and loneliness
- Decreased mobility and increased fall risk
- Lack of accessible, engaging therapies
- VR offers immersive, customizable, and engaging interventions

From Immersion to Insight: Scientific Tools in Play

- Today's presentations explore cutting-edge integrations:
- fNIRS and immersive VR for real-time neuroimaging
- Realistic avatars for guided cognitive stimulation
- AI wearables to monitor mobility in dementia
- XR vs VR comparisons for balance rehabilitation
- Managing cybersickness in older users



ARVR 2025S, Session 3 Contents

- Designing a naturalistic and interactive VR museum environment with a realistic avatar as a guide for cognitive treatment of the elderly
Amir, Bani Saeed, University of Manitoba, Canada
- On-Immersive Virtual Reality as a Safer Alternative for Cognitive Training in Older Adults: Investigating the Effect of Age on Cybersickness
Rashmita Chatterjee, University of Manitoba, Canada
- Acceptability of an AI-Powered Wearable Ring Sensor for Upper Body Mobility in Individuals with Cognitive Impairment: A Pilot Study
Mirella Vera, University of Manitoba, Canada

ARVR 2025, Session 4, Contents

- Extended Reality (XR) vs. Virtual Reality (VR) for AI-Driven Balance Improvement in Older Adults
Mirella Veras, University of Manitoba, Canada
- Employing Optical Brain Imaging for Real-Time Assessment of Brain Functions During Immersive Virtual Reality: Harnessing Potential for Neurorehabilitation
Asma Seraj PourShooshtari, University of Manitoba, Canada

Future Challenges

- Combining iVR with other modalities for better real time brain function investigation
- Challenges of these applications on aging population

