SA GeoTech 2017

“The use of Immersive Technology in Mining – The mine of the future”

Presented by Johann Louw
Manager: Kumba Virtual Reality Centre

Department of Mining Engineering
University of Pretoria

26th July 2017
Agenda

- Department of Mining Engineering new facility
- VR Centre for Mine Design
- Immersive technology in mining and other industries (some real clever examples)
- Conclusions
- Acknowledgements
- Questions
Kumba VR Centre (for Mine Design)

Vision
“To be a world class Virtual Reality Centre that enhances education and training to the benefit of safety and health and environment in the mining industry through an innovative approach to mine design”

Mission
“The Mission of the Kumba Virtual Reality Centre for Mine design is to develop a fully integrated mine design process in the Virtual Reality domain, including all relevant and related technology in the process of the optimisation of mine designs, incorporating Augmented Virtual Reality”

Slogan
“Making Vision Visible”
Short example of what we do with data
Immersive Technology in Mining

• Augmented Reality (AR)
• Virtual Reality (VR)
• Face masks and Holograms
• Scanning and 3D Printing
Defining Augmented Reality (AR)

A technology that superimposes a computer-generated image on a user's view of the real world, thus providing a composite view
Augmented Reality

- Instructional design of mining engineering course content (notes, textbooks, etc.)
- Inclusion of AR models to visually explain difficult content
- AR can display:
  - 2D images and animations
  - 3D models and animations
  - Interactive, user-controlled 2D images and 3D models
- Through…

Smartphones
Tablets
Glasses
Virtual Reality

- Experienced through the VR Stereoschopic theatre and 3D360 cylinder
- Advanced understanding of complex mine models and concepts
- Shared experience
- Experiential-based learning
Kumba VR Centre for Mine Design: 3D Theatre
Virtual Reality

- Advanced understanding of complex mine models
- Shared experience (no glasses/smart device required)
- Holograms can display:
  - 3D models
  - 3D animations
  - Interactive 3D models
  - User-controlled animations

Kumba VR Centre for Mine Design: 3D 360° Cylinder
3D Point cloud scanning
3D Printing
Conclusions

• The Department of Mining at the University of Pretoria now uses immersive technology as part and parcel of its teaching and learning strategy
• Immersive technology applications in Mining Education and Training incorporating risk management is here to stay we need to adapt it to our benefit
• Immersive Education has the ability to engage students and mining practitioners much more in their learning experience
• Incident reconstructions using VR and AR technology can and should be employed more as part of a risk prevention strategy
• Augmented Reality, Virtual Reality, holograms and 3D scanning have huge potential in its application in teaching and learning
• VR and AR also has the ability to expose trainees to risk without any harm
• Laser Technology and 3D printing (inversed immersion) has the potential to further enhance the learning experience
• The mining industry of the future will definitely not exist without Virtual Reality applications in the design phases
Acknowledgements

- Department of Mining Engineering
- Simulated Training Solutions for visuals
- The Risk Managers appointed in the Department
- University of Pretoria
Any Questions?