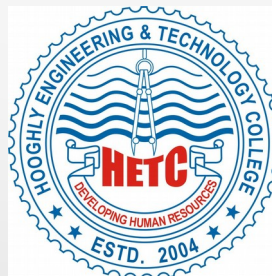# MIXED REALITY

MAMIK DAS

COMPUTER SCIENCE AND ENGINEERING
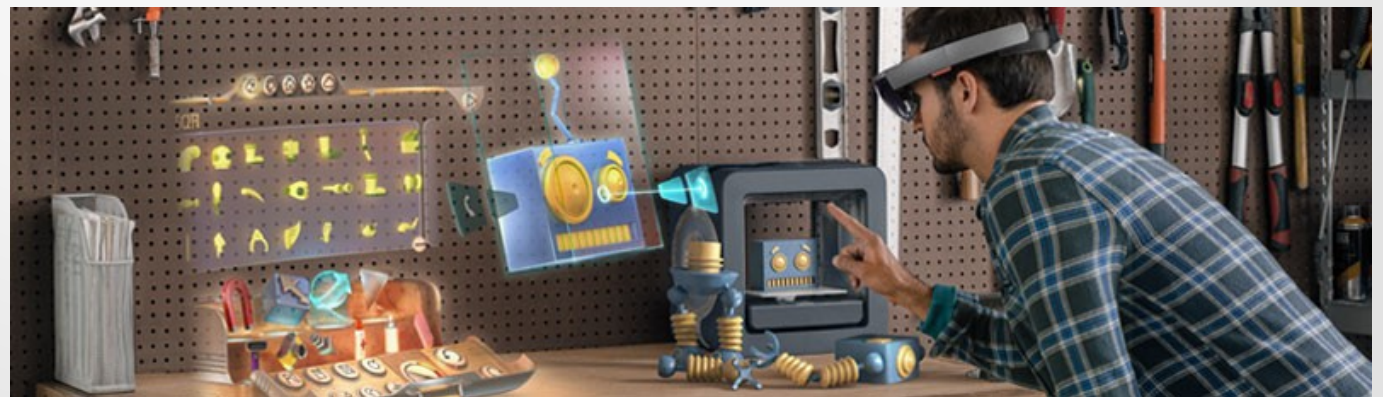
3rd YEAR

HOOGHLY ENGINEERING AND TECHNOLOGY COLLEGE

DEFINITION

- sometimes referred to as hybrid reality.

- It is the merging of real and virtual worlds to produce new environments and visualizations where physical and digital objects co-exist and interact in real time.

- Mixed reality takes place not only in the physical world or the virtual world.

The faces of MR

- Physical Reality (PR) – real world
- Virtual Reality (VR) – purely synthetic
- Augmented Reality (AR) – virtual assets registered in real world
- Augmented Virtuality (AV) – real (people, props) layered in virtual space

Preview It

SAMPLE VIEWERS

- GRAB A GOOGLE CARDBOARD

- SCAN THE QR CODE ON THE SIDE OF YOUR PHONE

- PLACE YOUR PHONE SCREEN FACING THE CARDBOARD

- PUT RUBBER BAND AROUND THE PHONE TO SECURE

- CLOSE FLAP WITH VELCRO

- VIEW THE VIDEO OR IMAGE-LOOK AROUND YOU.

AR VS VR

AR

- Overlay of object around us

- Use of phone or viewing device

- Usually uses target image

VR

- Immersion into another world

- Usually uses a head set and a mobile device

- Doesn't interact with real world

TOOLS OF TRADE

"VR" Blast from the Past

Viewmaster

CURRENT VR

Oculus Rift

Samsung Gear

HTC Vive

Google Daydream

Ideas

and

Apps

Ideas for the Classroom

- Document class trips and virtual tours
- Create 3D models for review/tutorial
- Immersive stories
- Student gallery of work to share
- Student created "expeditions"
- Walking tour of your community
- Writing prompts
- Document dissections
- "Trigger" walls in the classroom

Google Apps
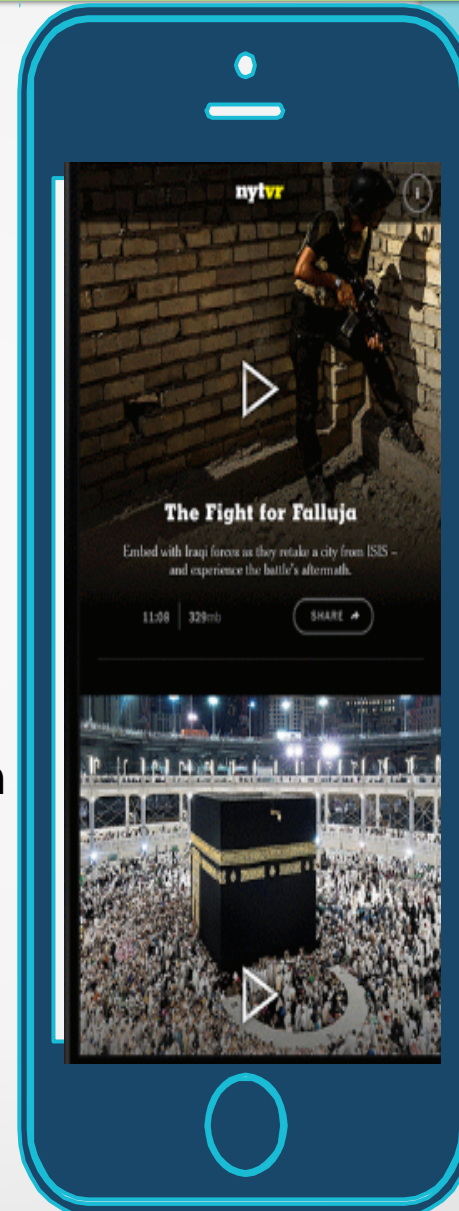
- Cardboard
  - Cardboard Camera
- Street View
- Expeditions
- Arts and Culture
- YouTube: 360 Channels
  - Pete's The Dragon
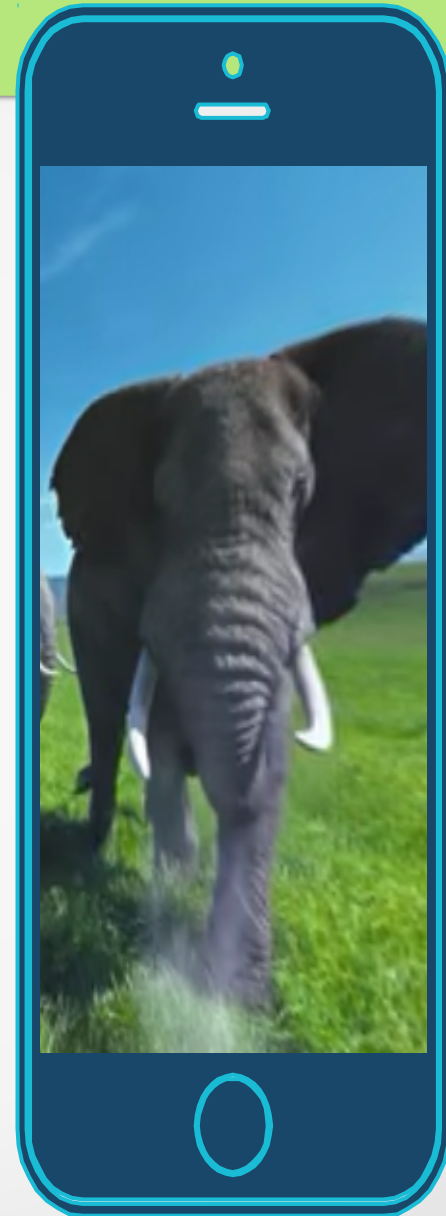
Create your own for most of these too!

Storytelling and News

- NYT VR
- Jaunt
- Within (formerly VRSE)
- Google Spotlight Stories
- Huffington Post - RYOT
- ABC News
- USA Today - Blue Angels, Cuba
- Littlstar

Social Studies

Apps

- ☐ <u>You Visit VR</u>
  - ☐ Cities, college campuses
- ☐ <u>Virtual speech</u>
  - ☐ Virtual audiences
- ☐ <u>VR cities</u>
  - ☐ Tour of major cities
- ☐ <u>Timelooper</u>
  - ☐ Travel back in time through London

360 Web Virtual Tours

- ☐ <u>Virtual Castles Tour</u>
  - ☐ Explore global castles
- ☐ <u>3D History</u>
  - ☐ Colosseum, WW1, and more
- ☐ <u>Virtually Anywhere</u>
  - ☐ Tours of US buildings in D.C.
- ☐ <u>360 Fullscreen Tours</u>
  - ☐ Pisa, Mt. St. Helens...

The Arts

- Google Arts and Culture
  - Explore National Parks
  - Artifacts, tours and more
- Guggenheim Museum
  - Amazing interactive tour
- Inside Abbey Road
  - Behind the scenes
- Indoor Street View
  - Tour inside of businesses

- Sketchfab VR
  - Virtual 3D models
- The Rare Book Room
  - Read the books online
- Tilt Brush (HTC Vive only)
  - Virtual drawing in 3D
- ThingLink
  - Interactive images

Science

VR Apps

- Discovery VR
- In Mind VR
- Mt. St. Helens (web)
- Cardio
- VR Planetarium
- 360 Surgery (YouTube)
- Anatomy You

AR Apps

- Elements 4D
- The Brain
- Brain scan
- Anatomy 4D
- Arloon Chemistry $
- NASA 3D Spacecraft
- Space journey VR/AR

Math

VR Apps

- <u>Agent Cayley</u>
  - Algebra based game
- <u>Cyberchase Shape Quest</u>
  - iPad- Elem. geometry, spatial
- <u>Times Table VR</u>
  - Multiplication game

AR Apps

- <u>Arloon Geometry</u> ($)
  - Calculations, spatial vision
- <u>Arloon Mental Math</u> ($)
  - Rounding, math facts, games
- <u>Fetch! Lunch Rush</u>
  - Elem. math facts, counting
- <u>Photomath</u>
  - Solve problems using camera

Augmented Reality

Elementary

- AR FlashCards
  - Shapes, Space, Addition
- Coloring pages that pop
  - Quiver
  - Crayola Color Alive
  - Chromville
- Fetch Lunch Rush
  - PBS games

- Popar Toys
  - AR books, charts, puzzles
- Spider Friend
  - Interact with spiders
- WizAR
  - Books, flashcards, text

Augmented Reality

Miscellaneous

- ☐ Google Translate
  - ☐ Real-time language translation
- ☐ LearnAR
  - ☐ Multiple subjects, web based
- ☐ Wikitude
  - ☐ Location based information

Enhanced Field Trips

- ☐ Skin and Bones
  - ☐ Museum of Natural History
- ☐ Gardens of Versailles app
  - ☐ Guided Tour info
- ☐ National Parks Maps
  - ☐ Guided Tours, Routes

Create

instead of consume

Create your own
VR and AR experiences

Tools for Creation

Mobile Devices

360 Cameras

Ricoh Theta
Nikon Key Mission 360
Kodak PixPro

Apps for Creation

- ☐ <u>Google Cardboard Camera</u> - capture 360 images
- ☐ <u>Google Street View</u> - explore or create photospheres
- ☐ <u>Aurasma</u> **-** create target images in under a minute
- ☐ <u>123D Catch</u> - capture rotatable, 3D objects, 3D printing option
- ☐ <u>Thinglink VR</u> - annotate 360 images to add audio, video, links
- ☐ <u>CoSpaces</u> - build interactive VR worlds online

Tools for Integration

◇ <u>Nearpod VR</u>

- Integrated VR lessons

◇ <u>ThingLink VR</u>

- Interactive images
- <u>Sample image</u> 1, <u>2</u>

◇ <u>CoSpaces</u>

- Build VR worlds

◇ <u>ZSpace</u>
- Apps for education*

Apps for Creation

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Resources for VR/AR

- 41 Ideas using Aurasma
- 5 Ways to use AR
- AR in education blog
- AR Writing Prompts
- Brainspace Magazine

- Teachers Pay Teachers
- 100 Virtual Tours
- VR Scout News
- VR in Education
- Kathy Schrock's Guide to AR

Fun Creation Apps

- ☐ <u>Video Affix</u> - add cool video effects to your videos
- ☐ <u>Car Finder</u> - create GPS scavenger hunt games
- ☐ <u>Amikasa</u> - 3D interior design/floor planning

CONCLUSION

The conventionally held view of a Virtual Reality (VR) environment is one in which the participant-observer is totally immersed in, and able to interact with, a completely synthetic world. Such a world may mimic the properties of some real-world environments, either existing or fictional; however, it can also exceed the bounds of physical reality by creating a world in which the physical laws ordinarily governing space, time, mechanics, material properties, etc. no longer hold.

BIBLIOGRAPHY

This resource are taken from Google I/O 2017 Held in California.

THANK YOU FOR WATCHING