

# STATE OF THE ART IN DIGITAL VET -relevance of AR

## SLOVENIA

SEP. 2022

Gospodarska  
zbornica  
Slovenije 

Zbornica gradbeništva in  
industrije gradbenega materiala

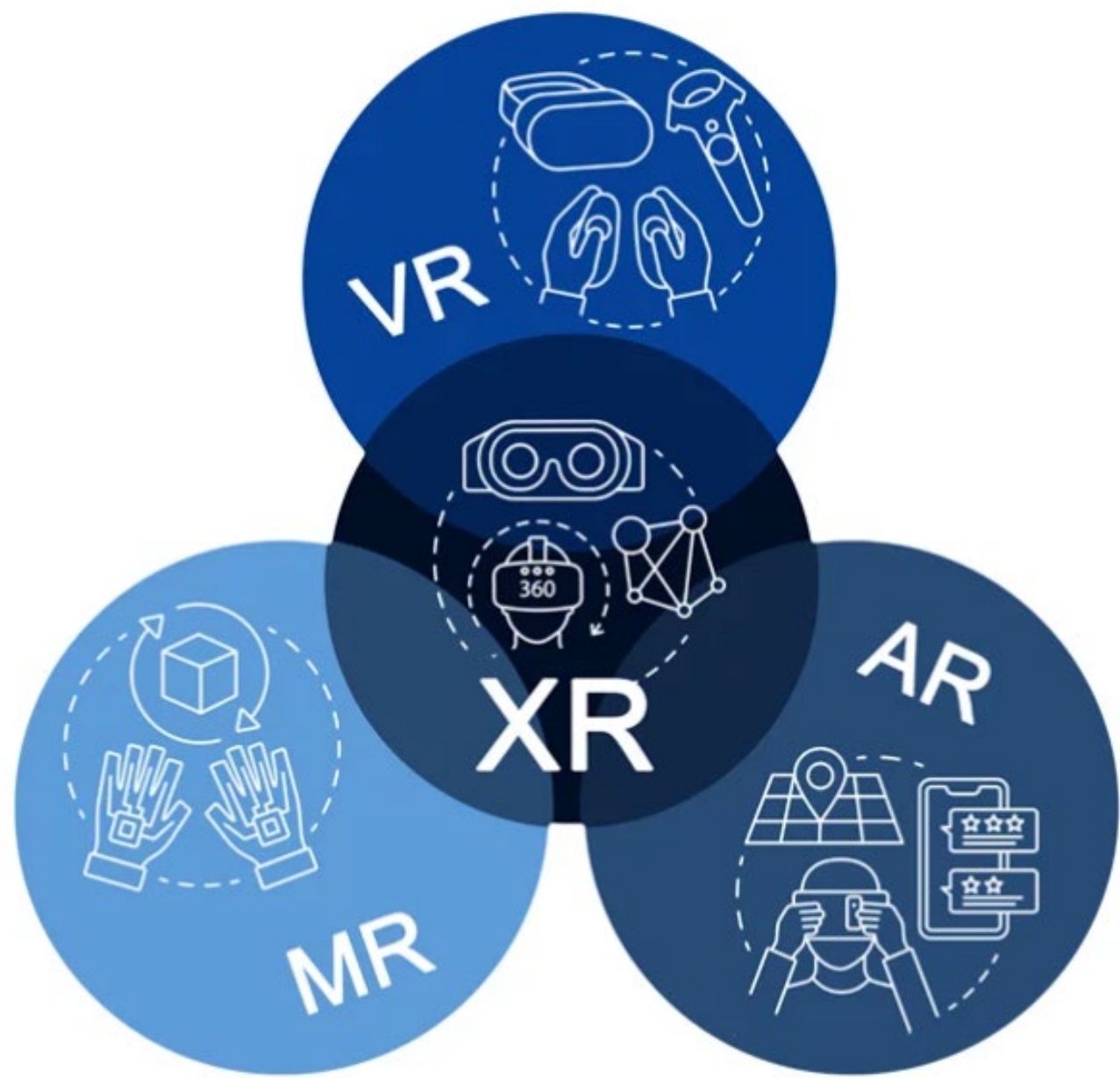


# MINI ONLINE RESEARCH

executed in Sep 2022

by CCIS among VET public and private schools (10) and faculties (3).

ANSWERS (5) ARE ...



eXtended  
Reality (XR)

**Augmented Reality (AR)**  
Virtual objects  
Real environment

**Mixed Reality (MR)**  
Real objects  
Virtual environment

**Virtual Reality (VR)**  
Virtual objects  
Virtual environment



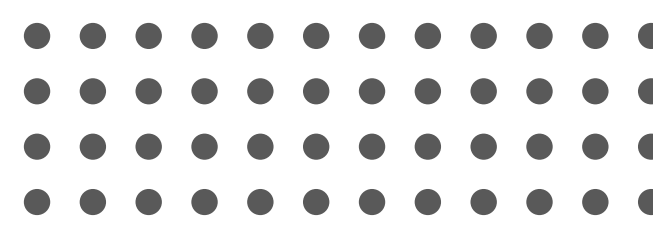
# Secondary School of Civil Engineering and Environmental Protection, Celje

- They use VR, in the fourth year, for training in Archicad (BIM). They design the model in Archicad, export the products to BIMx format and look at them in cardboard glasses using their phone.
- For more advanced presentations they use Twinmotion and Oculus Rift.
- They use the equipment mainly for promotional purposes.
- AR and MR equipment they do not have and do not currently intend to buy.





# Secondary School of Construction and Gymnasium Maribor

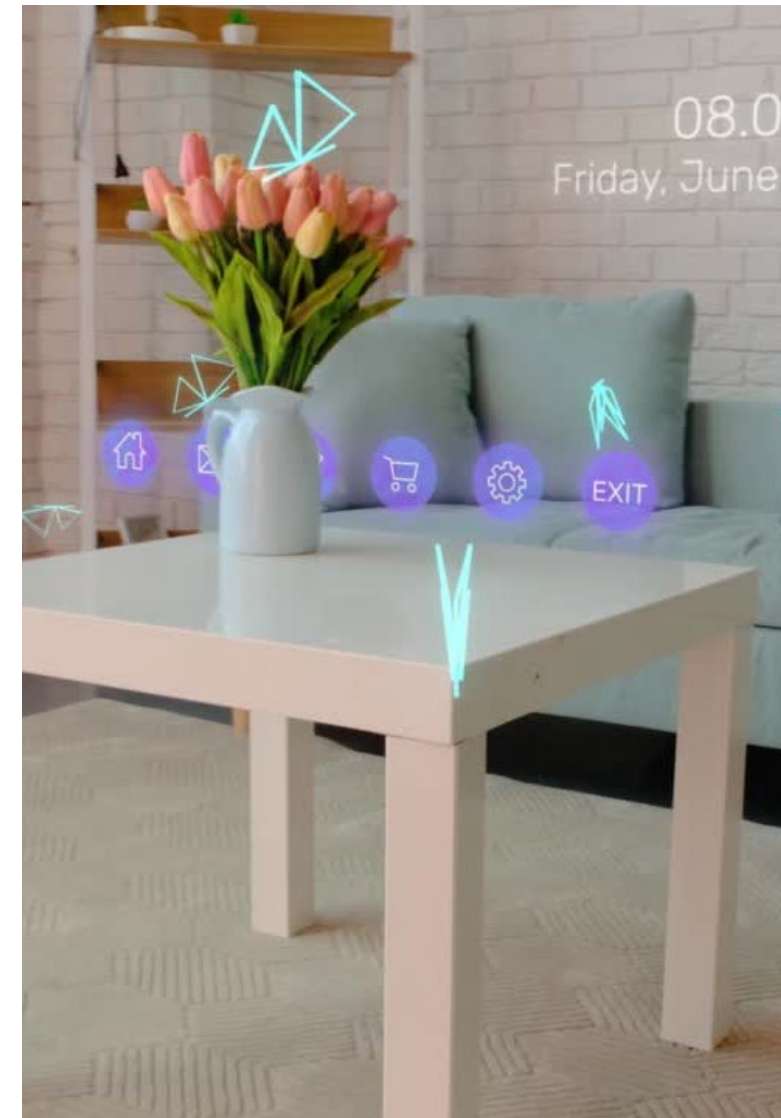


Teachers of vocational subjects in the Construction Technician and Environmental Technician programmes introduce students to examples of augmented reality in the form of humorous trivia.

For example, the fountain of Charles of Bohemia, designed by the young architect Plečnik in Vienna in 1909, is transferred to school environment. Using a smart tablet, they place it in the classroom, walk around it, observe the details ...

# ACADEMIA College, Maribor

- Labster virtual laboratories for building materials
- No other AR equipment, but considering purchasing it and introducing it into educational process
- Thesis on this topic: 'USE OF VIRTUAL REALITY TO IMPROVE THE PLANNING AND CONSTRUCTION PHASE OF BUILDINGS'





# Faculty of Civil Engineering, Transportation Engineering and Architecture, University of Maribor

In the teaching process with students in the Construction Safety course, they include MRI where they use a Trimble XR10 with HoloLens2.

They do not intend to purchase additional equipment for now.

The reaction of the students was inspiring, especially of those who had the opportunity to use this type of equipment live for the first time.

Using a previously prepared test or school example, they first learned about the basic functions and how to use the equipment, and then discussed the possibilities of its use in the construction industry.



# Faculty of Civil Engineering, Transportation Engineering and Architecture, University of Maribor

A short write-up in a scientific paper to be presented soon at the OTMC 2022 conference in Cavtat:

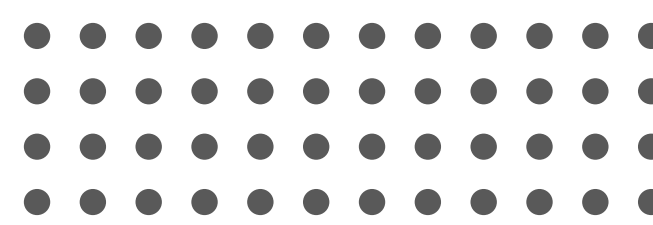
<https://www.otmc-conference.com/>

Furthermore, students also gain knowledge and skills about advanced augmented reality technologies. It is a combination of a real environment with digital elements, and which allows visualization of the built environment in 1:1 scale. Technology is quite new in the construction industry and in practice only a few applications can be traced at present. However, we believe that this technology has a very high potential and it is expected that more innovations in the field of construction project management will be developed in the coming years. Figure 5 shows an example of the use of advanced mixed reality during exercises in subject Safety in construction work.



Figure 5. Use of advanced mixed reality during the study process

# Faculty of Civil and Geodetic Engineering, University of Ljubljana



Introducing students to VR and AR as part of the study process for quite some time now.

Recently mainly in connection with BIM.

Practices from a collaboration with Stanford University.

Presenting the content in several courses:

- **First year** VR and AR are introduced conceptually in the Engineering Communication course.
- **Second year**, applying these technologies in more detail in Computer Integrated Construction, Engineering and Communication Technologies in the Built Environment ...

All students are introduced conceptually, more in detail Master's students.

Virtual reality is regularly used as a visualization method in many undergraduate and postgraduate courses

The first PhD in Augmented Reality was awarded in 2014.

As of 2022/23, we are introducing metaverse into the full-time Master's programme.



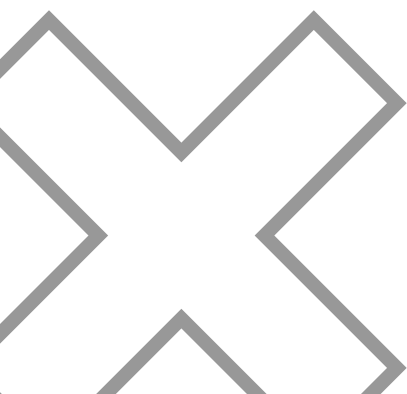


## Faculty of Civil and Geodetic Engineering, University of Ljubljana

### Used technology:

- Mainly Google Cardboard, low entry threshold (students used their own phones and our glasses/supports).
- Graphisoft's BIMx for exported models from BIM.
- Some experimentation with Dalux and mobile devices.
- Plan: purchase of 12 Oculus Rift wearables

Picture from FGG information day.



# VR app as a showcase for company products (roof windows) built in selected space



## Aplikacija za inspiracijo Odprta vrata mansard

Za vas smo pripravili popolnoma novo doživetje, kjer si lahko ogledate izbrane mansarde v zanimivih virtualnih tehnologijah. S pomočjo miške potujte po prostoru na spodnji sliki. Za še več inspiracije pa obiščite spletno stran ali si na pametni telefon naložite aplikacijo Odprta vrata mansard in si prostore ogledajte s pomočjo žiroskopa ali celo preko 3D očal. Poiščite inspiracijo za urejanje svetle mansarde za prijetno bivanje.

> Pojdi na spletno stran

> Naloži aplikacijo na pametni telefon

> Brezplačna VR očala

For general public:  
<https://www.youtube.com/watch?v=AHFcYkBMEVM>

For architects:  
<https://www.youtube.com/watch?v=9yCUFqPveJs>

App developer from Slovenia -  
<https://505vr.com/en/Reference/VR-VELUX-Mansard>

### Brezplačna 3D očala

Izpolnite spodnje podatke in poslali vam bomo brezplačna 3D očala za neverjetno doživetje izbranih mansard v virtualni tehnologiji.

GET IT ON  
Google Play

Download on the  
App Store



# VR in the furniture industry

<https://www.youtube.com/watch?v=UudV1VdFtuQ>

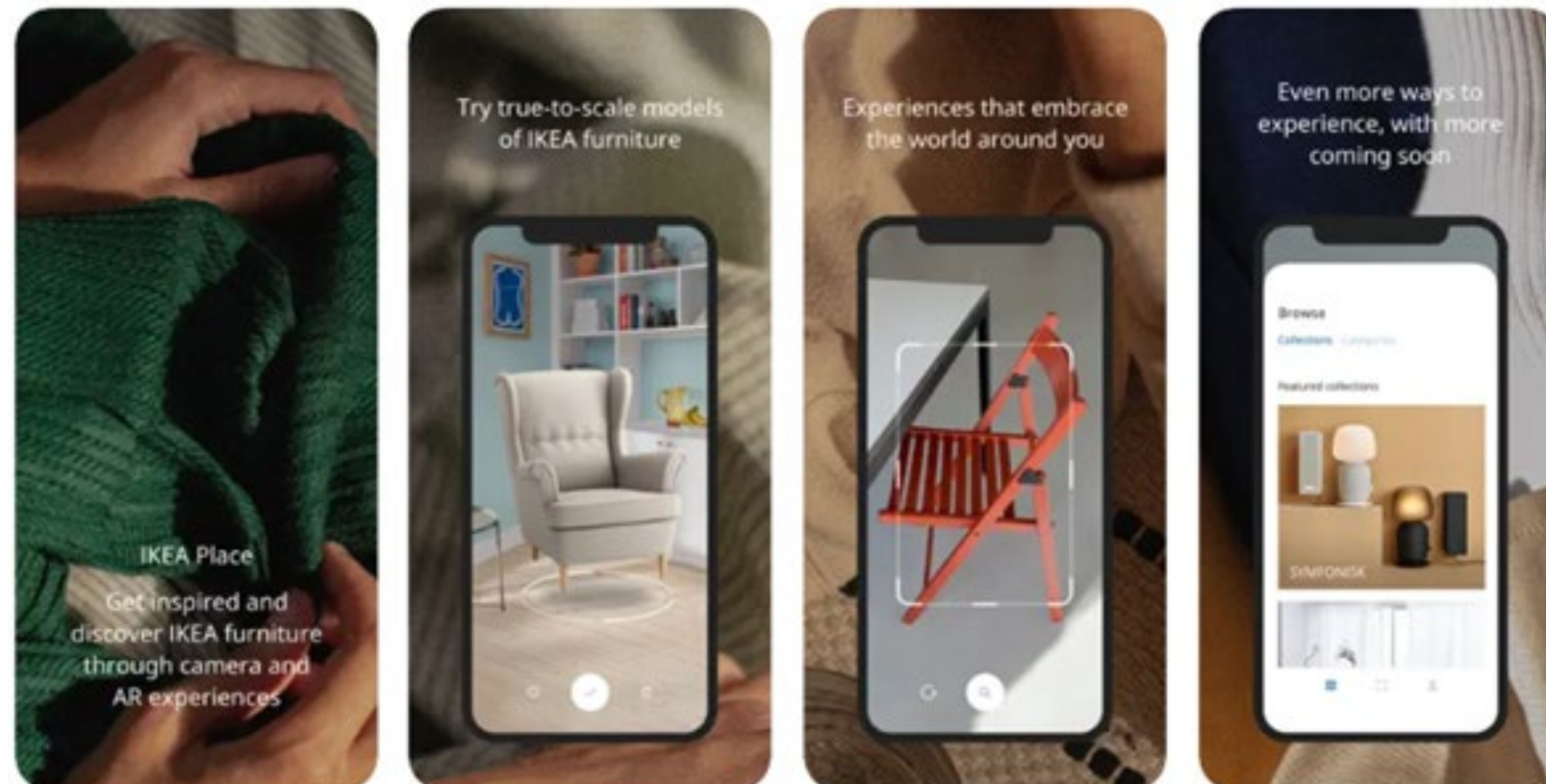
## App Store Preview

This app is available only on the App Store for iPhone and iPad.



**IKEA Place** 4+  
Augmented Reality Furnishing  
Inter IKEA Systems B.V.  
★★★★★ 4.8 • 5.0K Ratings  
Free

## Screenshots iPhone iPad





# The plan of the CCIS CCMBIS for the MEGRA fair

## PRESENTATION OF THE SECTOR VIA AR??







# THANK YOU



Gospodarska  
zbornica  
Slovenije 

Zbornica gradbeništva in  
industrije gradbenega materiala