

*Utilizarea tehnologiilor de realitate virtuala  
si augmentata (RVA) in procesul  
educational*

*Dorin-Mircea POPOVICI*

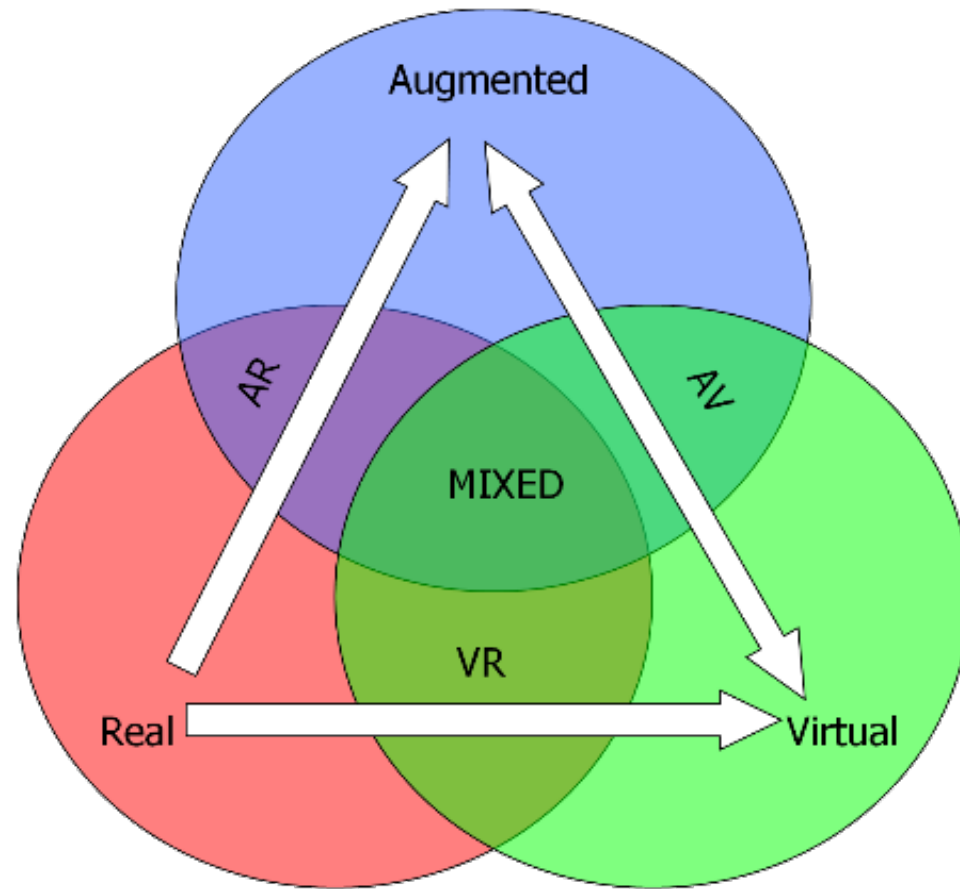
21 Septembrie 2020

# Plan

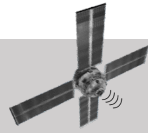
- 1. Introducere
- 2. Metafore utile in aplicarea tehnologiilor RVA
- 3. Instrumente software de creare de continut 3D
- 4. Instrumente software pentru crearea aplicatiilor de RVA
- 5. Beneficiile RV in educatie si RA in invatare
- 6. Exemple

# 1. Introdurre

# Ce sunt realitatea virtuala si realitatea augmentata?



# De la RV la RA



**GPS**  
global position

**CAMERA**  
captures real world  
images & sounds

**HMD sensor**  
user orientation

**HMD displays**  
mixed images  
& sounds

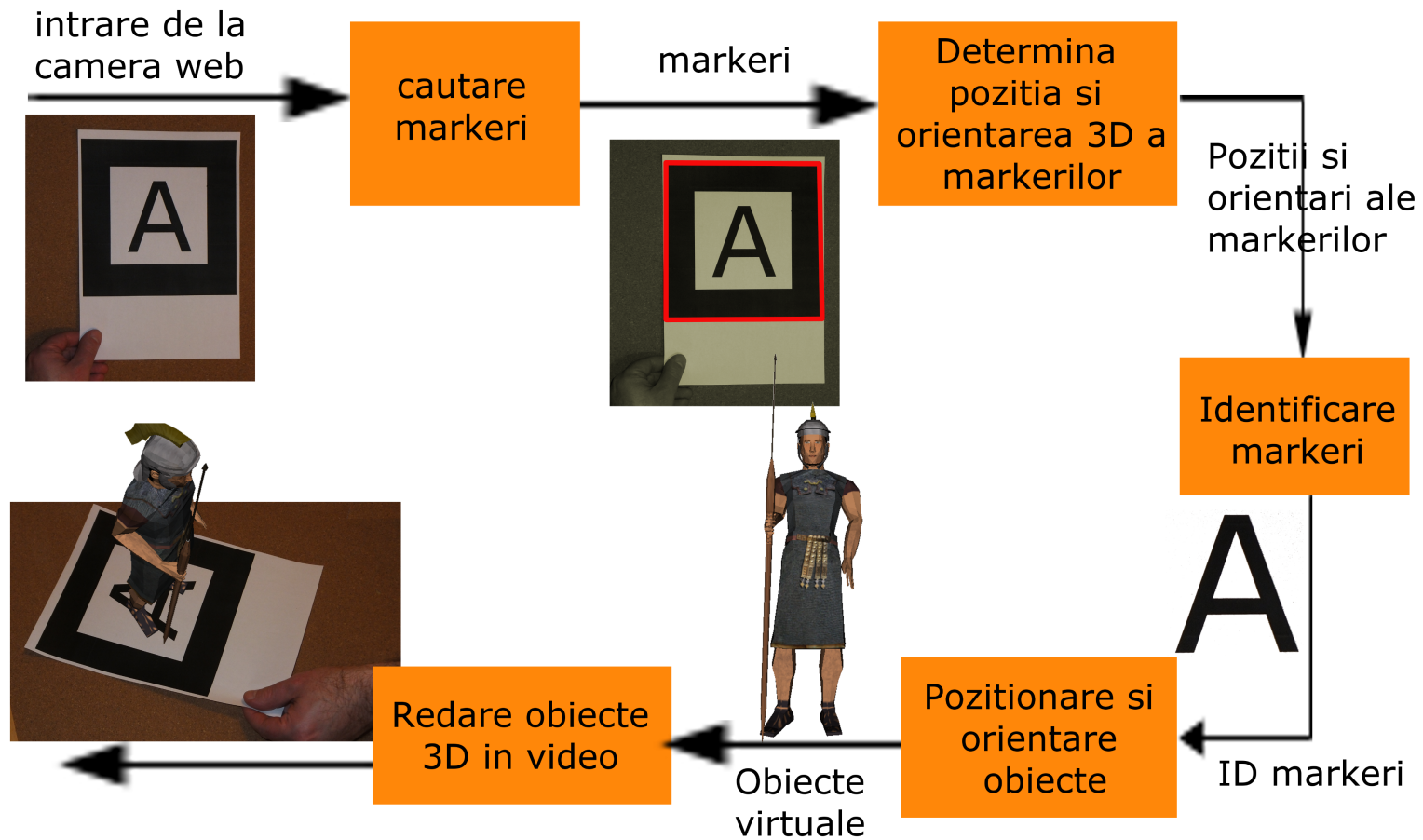
**COMPUTER**  
information  
integration & virtual  
scene generation

**WII**  
user interaction

**VIDEO  
PROCESSING**  
real & virtual



# Cum functioneaza RA?



# Tehnologii hardware disponibile



## 2. Metafore utile in aplicarea tehnologiilor RVA

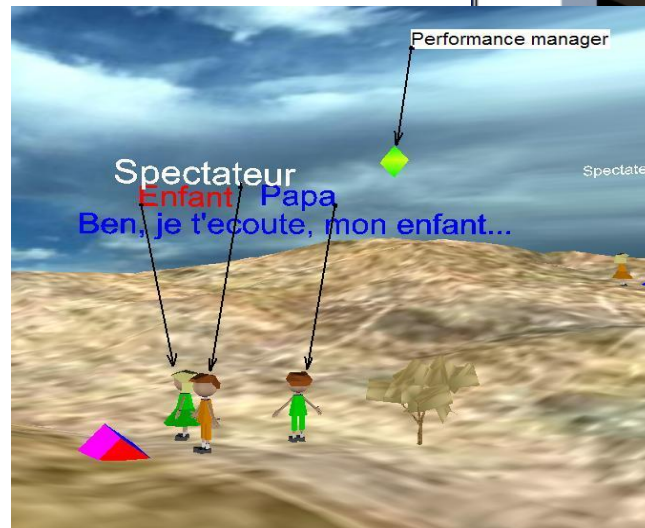


# Metafore utile in aplicarea tehnologiilor RVA

- Clasa virtuala



- Storytelling



# Tipuri de aplicatii RVA pentru educatie si formare



individ



grup



locatie



colocatie

### 3. Instrumente software de creare de continut 3D

# Instrumente software de creare de continut 3D



Notepad++



blender™



VRMLPad



3DS MAX

X3D-Edit



SketchUp



VivatyStudio

## 4. Instrumente software de creare de RVA

# Instrumente software de creare de RVA

ARToolKit  
Maxst  
Aurasma  
Unreal  
Wikitude  
Unity  
EasyAR  
Xzming  
HPRevealStudio  
ARCore  
DeepAR  
Augment  
SteamVR  
Layar  
Blippar  
ARKit  
Vuforia  
Aryzon  
ViewAR  
SMART

## 5. Beneficiile RV in educatie si RA in invatare

# Beneficiile RV in educatie si RA in invatare

- Clasa augmentata prin RA
  - Animatii, interactiune, atentie, implicare
- Explicarea conceptelor abstracte
  - Vizualizare interactiva
- Plasare in timp si spatiu
  - Explorare vizuala si interactiva
  - Stimularea conexiunilor dintre conceptele prezentate
  - Sentiment al prezentei in situatie ridicat
- Scalarea experientelor
  - Scalabilitate, dinamicitate, realism si adaptabilitate
  - Grad ridicat al implicarii



# Beneficiile RV in educatie si RA in invatare (cont)

- Invatarea prin practica
  - Invat facand (greseli)
  - Transferul expertizei virtuale in mediul real
  - Experimentare parametrizabila si adaptabila in timp real orientata pe individ
- Implicare emotionala
  - Secretul unei lectii memorabile = emotie puternica unica
- Invatare prin
  - Invatare prin descoperire
  - Modelarea spatiului virtual ... dedicat experientei interactive
  - Schimbarea metaforei de predare – invatare
  - Utilizarea materialelor accesibile la nivel global multicultural independent de abilitatea/dizabilitatea elevului
  - Vizualizare prin instantierea unor concepte abstracte eventual intr-o relatie cu concepte cunoscute anterior
- Colaborare prin imersiune educationala

# Beneficiile RV in educatie si RA in invatare (cont)

• Creativitate

• Motivatie

• Mobilitate topologica

• Sarcina cognitiva

• Interactiune

• Atractivitate

• Mobilitate temporala

## Locul VARs in sistemul educational

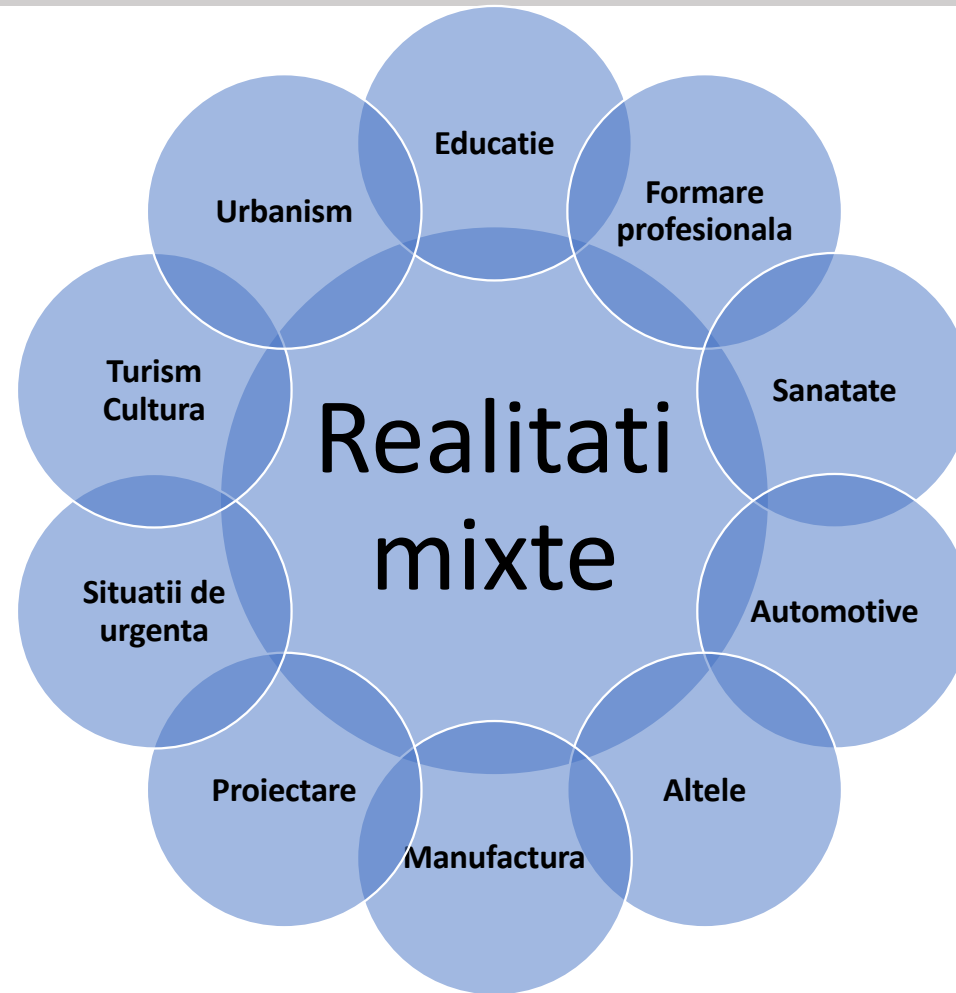
**Transformarea actului educational intr-o experienta sociala, puternic colaborativa, adaptata la student si dirijata/acordata/mentorata de profesor!**

# De la idea unei lectii la implementarea ei utilizand tehnologii ale realitatilor mixte

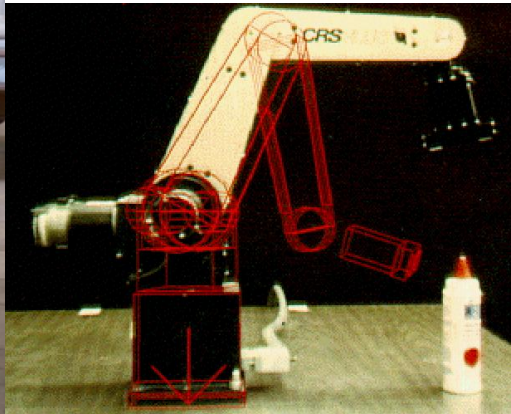
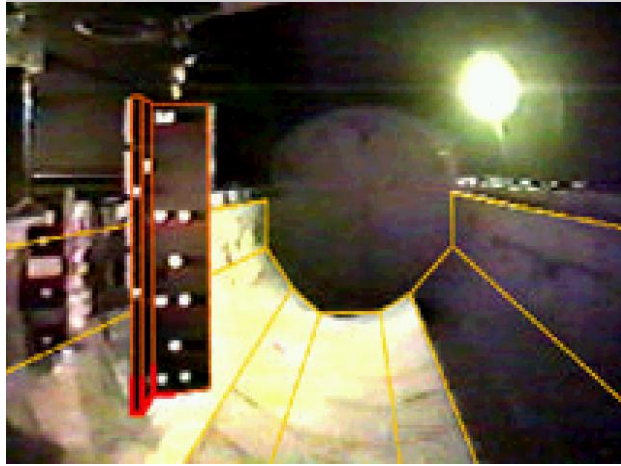
- Reteta secreta:
  - Selectati cu atentie subiectul. Nu orice subiect poate fi tratat prin RVA.
  - Validati idea si testati viabilitatea pentru a avea o imagine clara asupra potentialului sau.
  - Cunoasteti-va publicul tinta!
  - Construiți un prototip minimal functional. Atentie, scopul aplicatiei este de a oferi cursantilor o experienta si nu de a difuza continut 3D.
  - Aveti in vedere eficientizarea invatarii prin implicarea cursantului prin stimularea curiositatii acestuia si prin reutilizarea rezultatului invatarii in mediul real.

## 6. Exemple

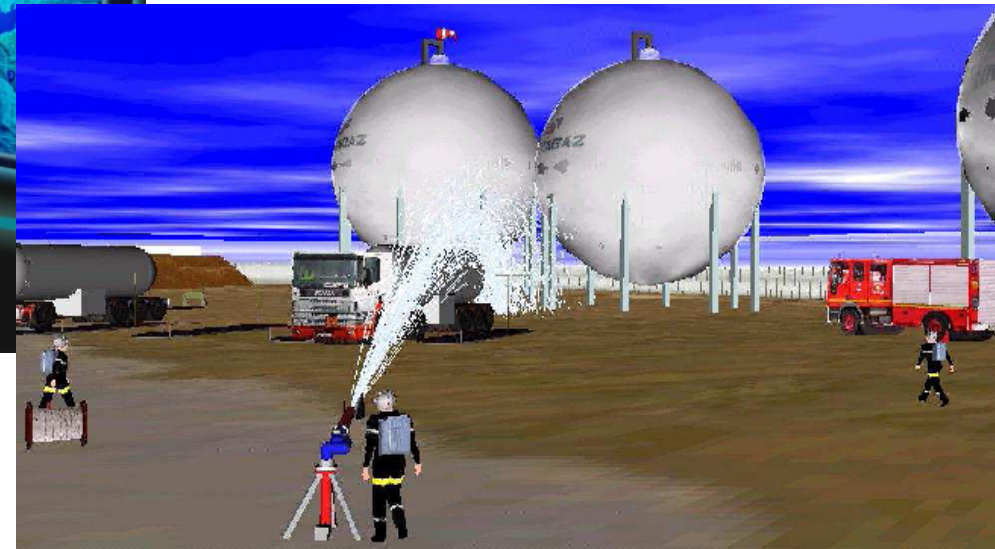
# Pozitia realitatilor mixte in piata muncii 4.0



# Formare profesionala



# Situatii de urgenta





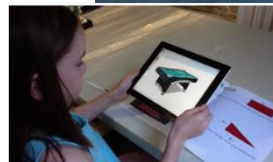
# Educatie



Use of Augmented Reality in Education ...  
thinkmobiles.com



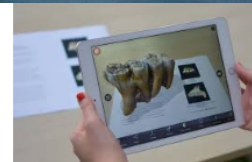
Augmented Reality in Education: The ...  
education.viewsonic.com



Augmented Reality in education - YouTube  
youtube.com



Augmented Reality and its Potential ...  
iamwire.com



Augmented Reality and Education  
bntimes.com



Augmented Reality Apps for Education ...  
virtualrealitypop.com



use Augmented Reality in Education ...  
augment.com



The Multiple Uses of Augmented Realit...  
emergingedtech.com



Augmented Reality in Education: The ...  
easternpeak.com



Augmented Reality for Education - PiRuby  
piruby.com



iPad Event Pushes Augmented Reality ...  
next.reality.news



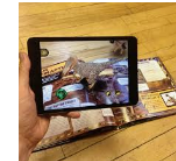
Augmented Reality in Education sector ...  
youtube.com



Augmented Reality in Education: The...  
education.viewsonic.com



Augmented and Virtual Reality Education ...  
eoreality.com



Emerge Edtech Insights ...  
medium.com



Augmented Reality in Education ...  
emergingedtech.com



Vuforia Brings Augmented Reality To ...  
fractuslearning.com



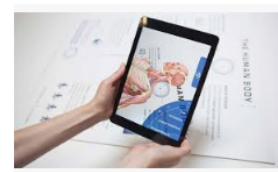
Augmented Reality for Education - The ...  
infinitespider.com



How to Make an Augmented Reality App ...  
maker.pro



teaching tool or passing trend ...  
leonar3do.com



Enhanced Learning through Augmented ...  
ww2.kqed.org



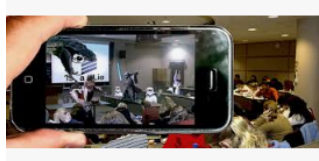
Augmented Reality for the Classroom ...  
educationworld.com



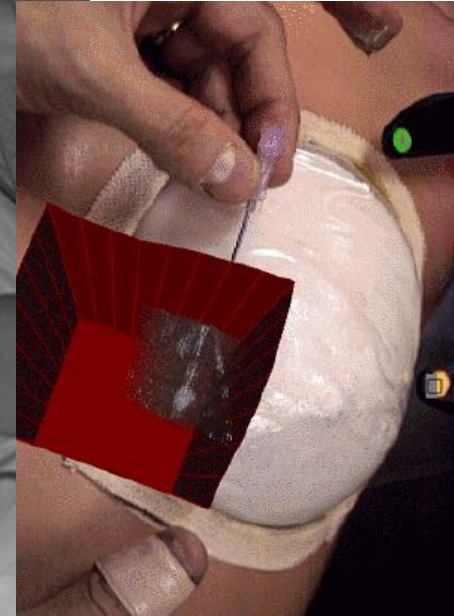
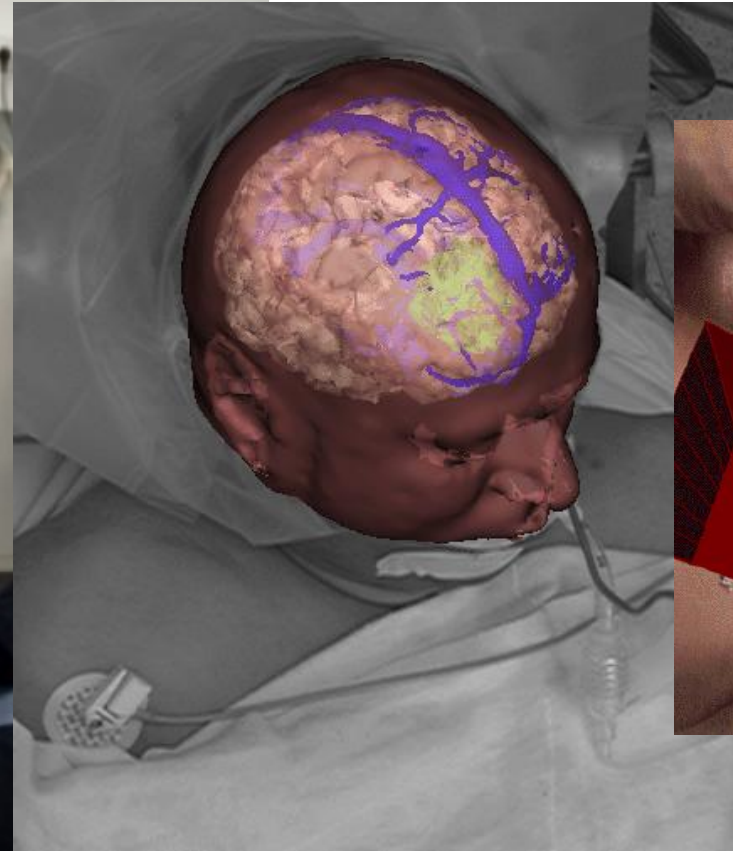
Medical Virtual Reality  
nishanrajain.com



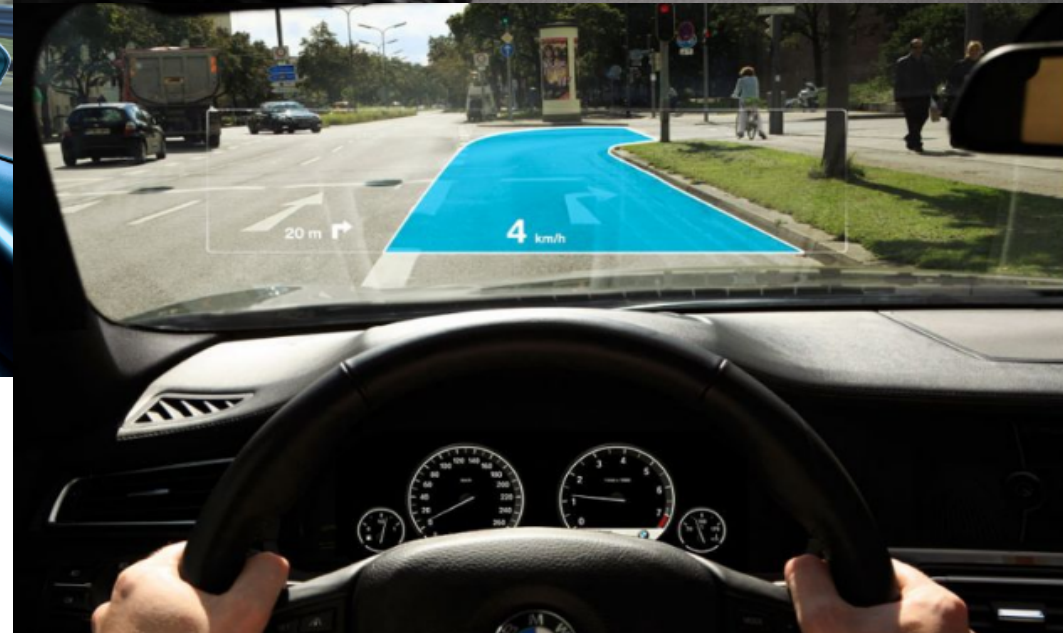
Augmented Reality Learning App for Kids ...  
edtechreview.in



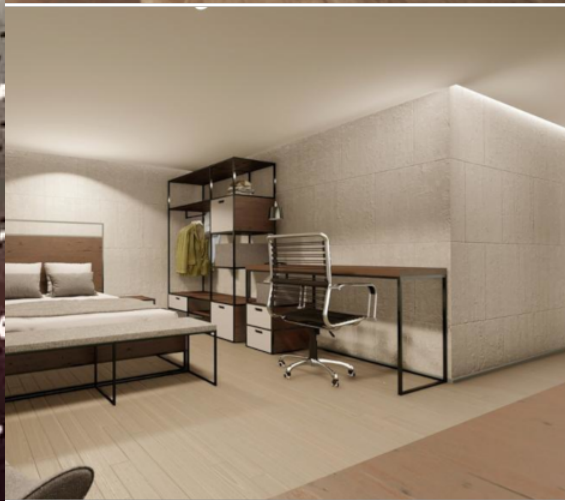
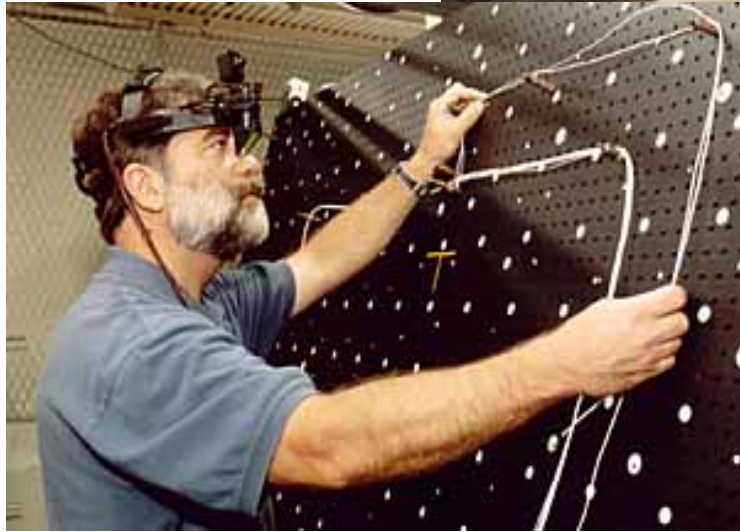
# Sanatate



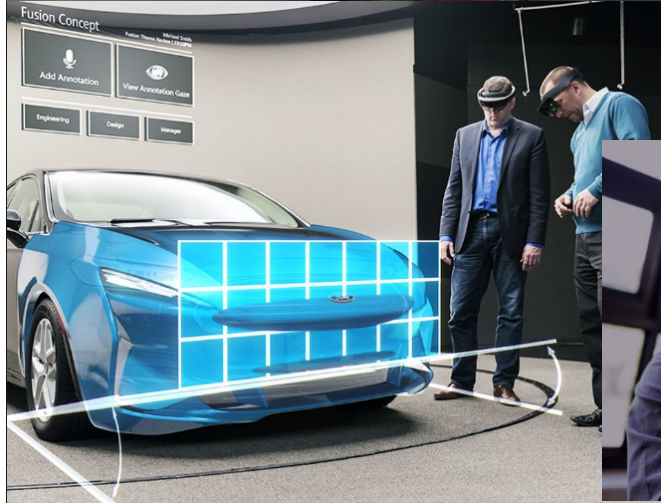
# Automotive



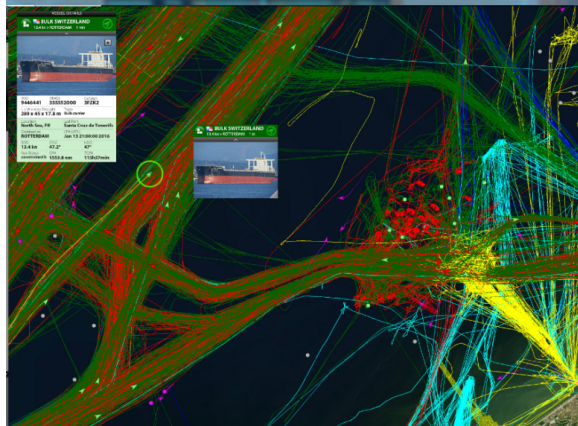
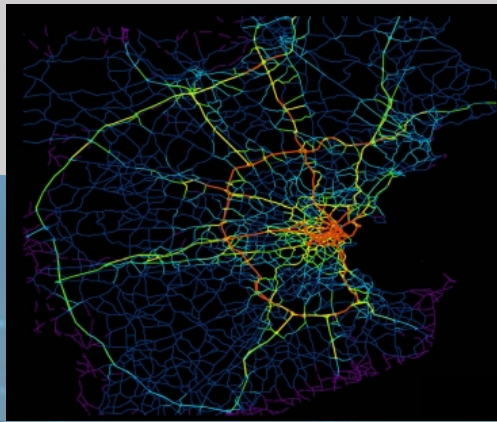
# Manufactura / design interior



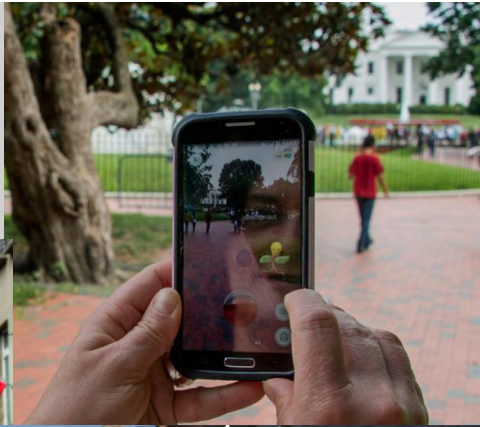
# Proiectare



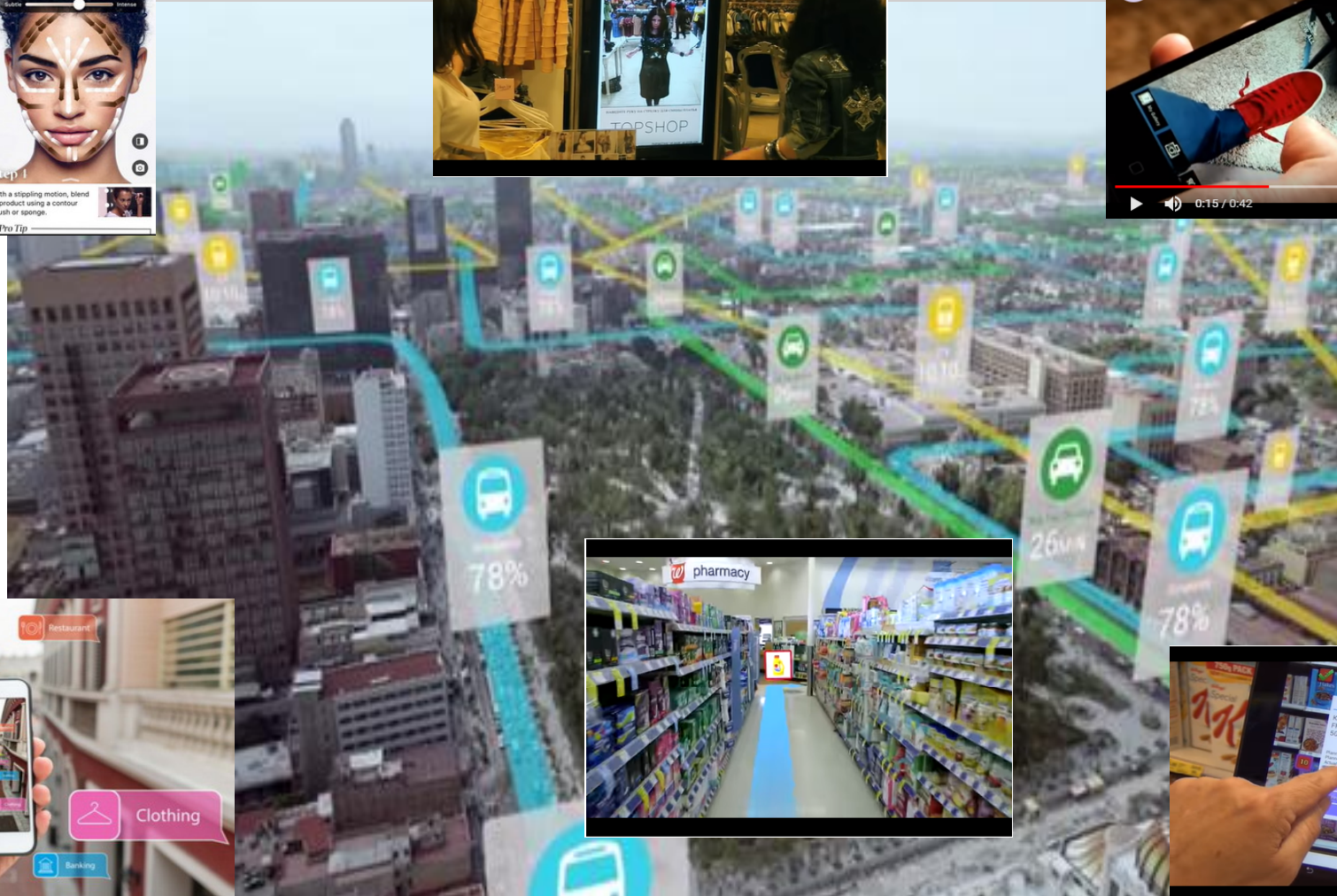
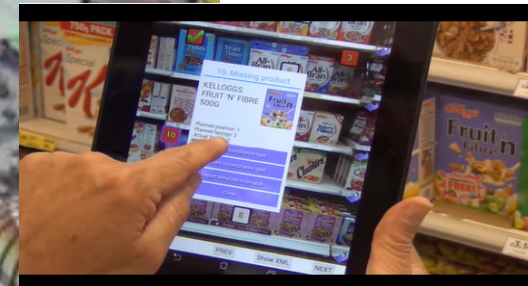
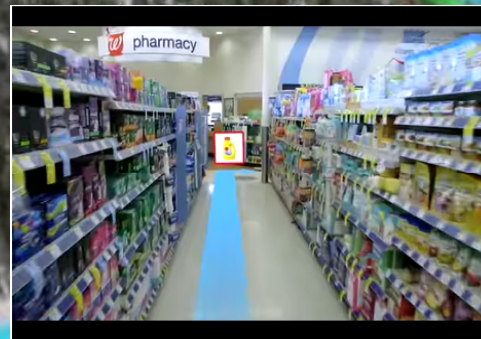
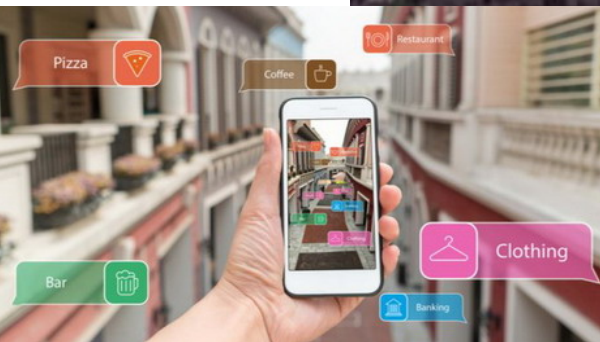
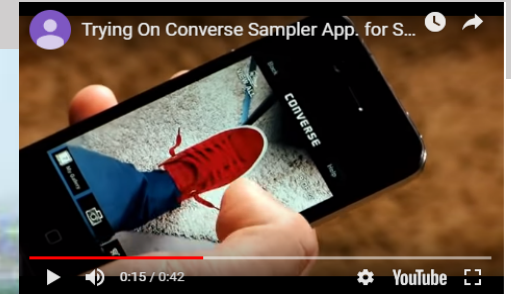
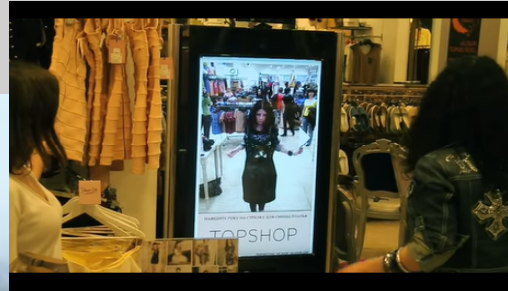
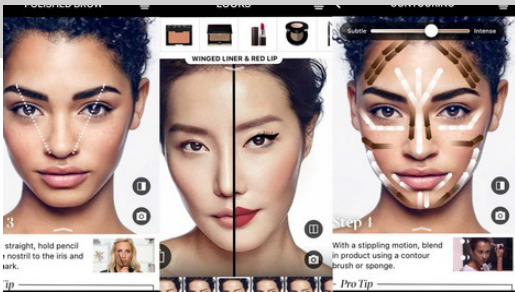
# Urbanism



# Turism / cultura



# Comert





# Altele



# Expertiza, abilitati si competente vizate si dobandite prin utilizarea realitatilor mixte

## Competențe personale

Gândirea creativă

Auto-organizare

## Competente sociale

Manipularea comp

Colaborare, lucru in echipa

Aptitudini metodic

Comunicare

Flexibilitate

Interdisciplinaritate si intercu

Mobilitate

Management si control al pro

Flexibilitate

Imbunatatirea inovarii

Capacitate inovato

Rezolvarea problemelor

Optimizarea solutiilor

Competente de lider

## Abilitati IT si de lucru cu date

Analiza datelor

Cloud computing

Programare

Inteligenta artificiala

Algoritmi

Design

Aplicarea instrumentelc

Dezvoltarea de aplicatii

## Expertiza profesionala

Reglarea si controlul sistemelor complexe

Comunicarea cu dispozitivele si sistemele in retea

Incidenta si interventia in situatii critice

Procesul de cunoastere / intelegere holistica

Luarea deciziilor bazate pe date

Intelegerea cerintelor logistice si a conditiilor de livrare

Dezvoltarea interdisciplinara a sistemelor de productie

Asigurarea calitatii

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