Developing and using XR Apps in a University

AR & VR HIGHER EDUCATION

Immersive learning experiences on a budget

21 Mar 2024, 14:00 – 15:30

Mikhail Fominykh
Norwegian University of Science and Technology ++

21.03.2024

Media & Learning

IMTEL
Innovative Immersive Technologies for Learning
https://www.ntnu.edu/imtel

Explore

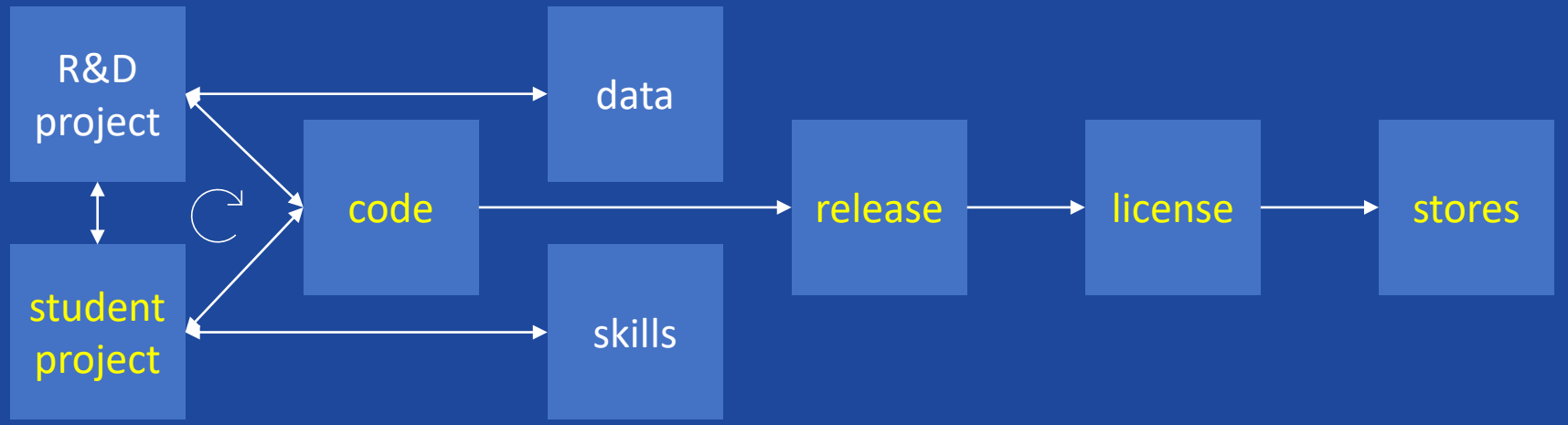
Educate

Experiment

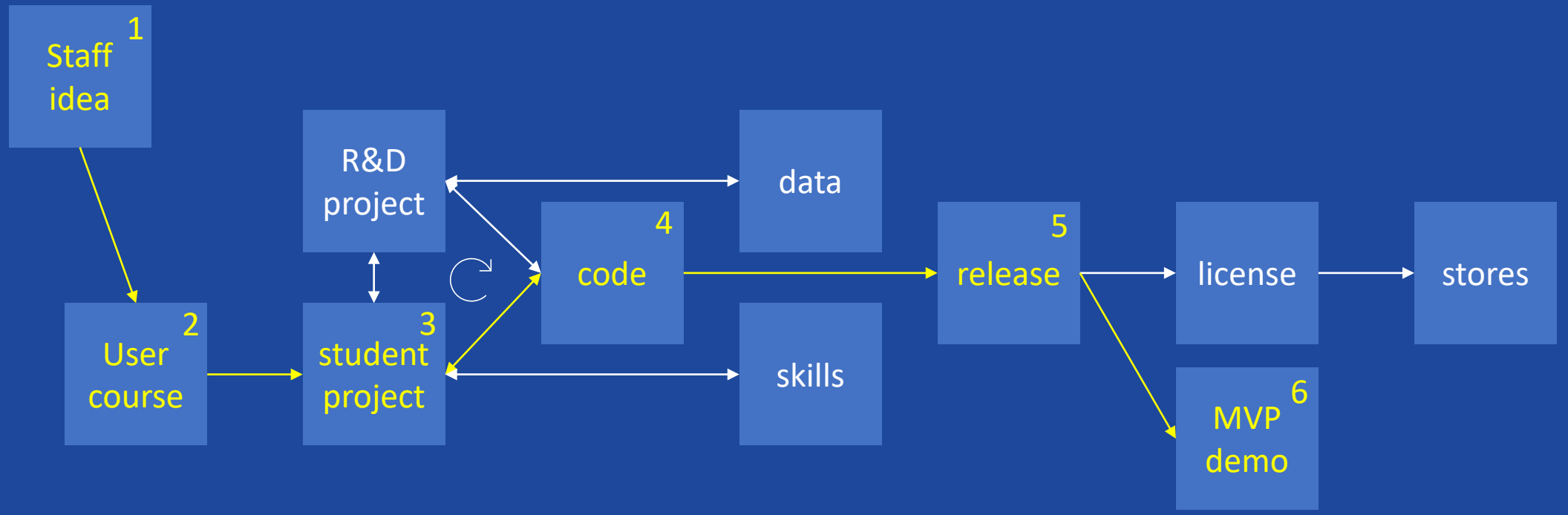
NTNU
IMTEL – Innovative Immersive Technologies for Learning

Organization and processes

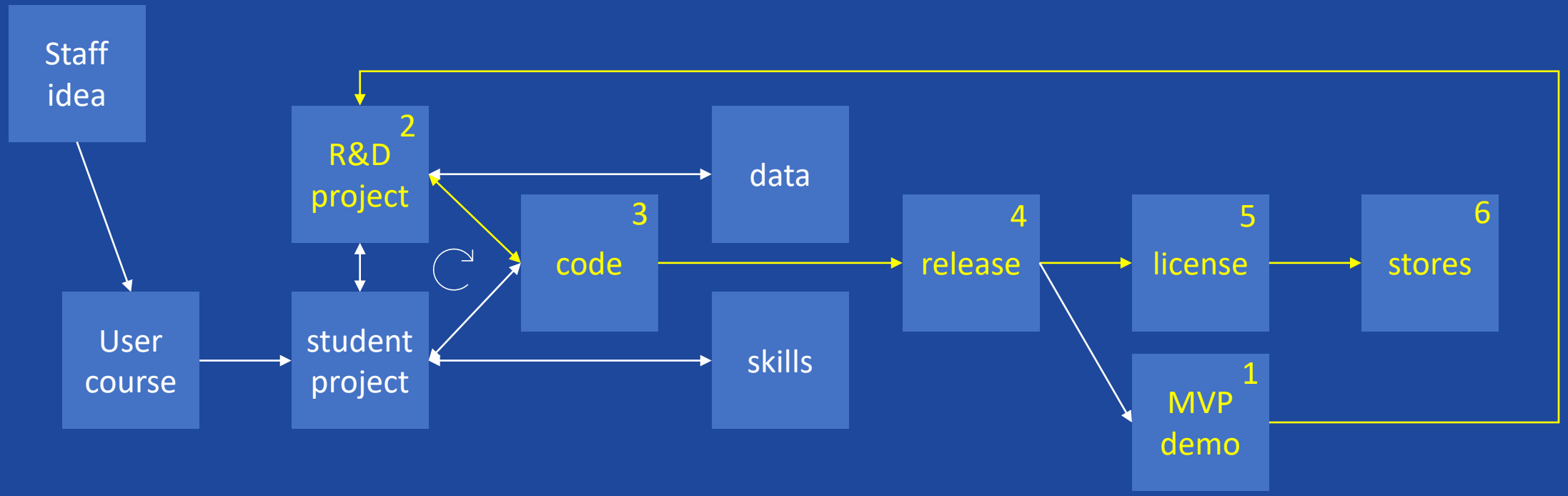
Student projects in the lab



From idea to prototype on a budget



From idea to prototype on a budget



Nevrolens

Learning Neuroanatomy with Augmented Reality

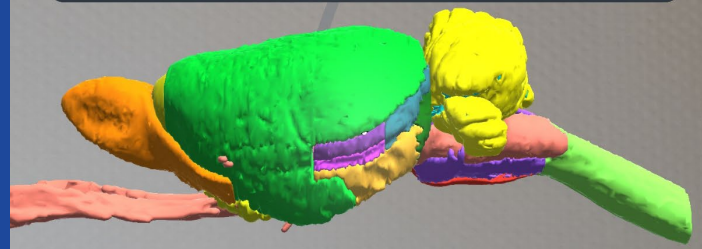
https://www.ntnu.edu/imtel/nevrolens

Information Board

Hide

Waxholm Space Atlas Of The Sprague Dawley Rat Brain

Open access volumetric atlas offering comprehensive anatomical delineations of the rat brain based on structural contrast in isotropic magnetic resonance (39 µm) and diffusion tensor (78 µm) images acquired ex vivo from an 80 day old male Sprague Dawley rat at the Duke Center for In Vivo Microscopy. Spatial reference is provided by the Waxholm Space coordinate system. The location of bregma and lambda are identified as anchors towards stereotaxic space. Application areas include localization of signal in non-structural images e.g. functional or pharmacological MRI and PET.

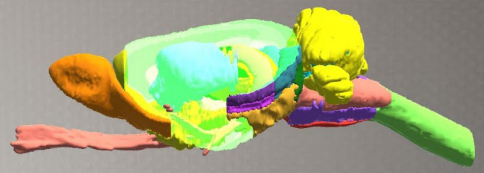


Home Task Catalogue Dissect

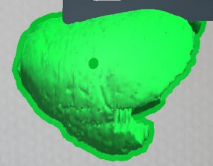
Quiz

Can you locate the Presubiculum?

Cancel Next



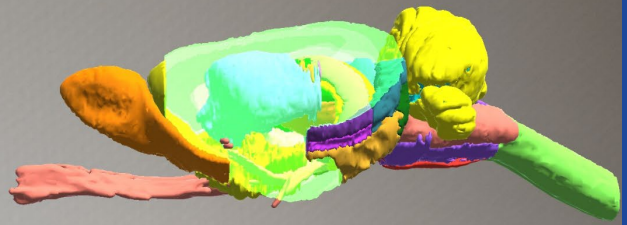
Answer?



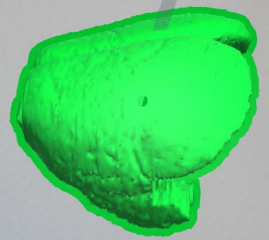
Back Quiz Discuss

Waxholm Space Rat Brain

Show

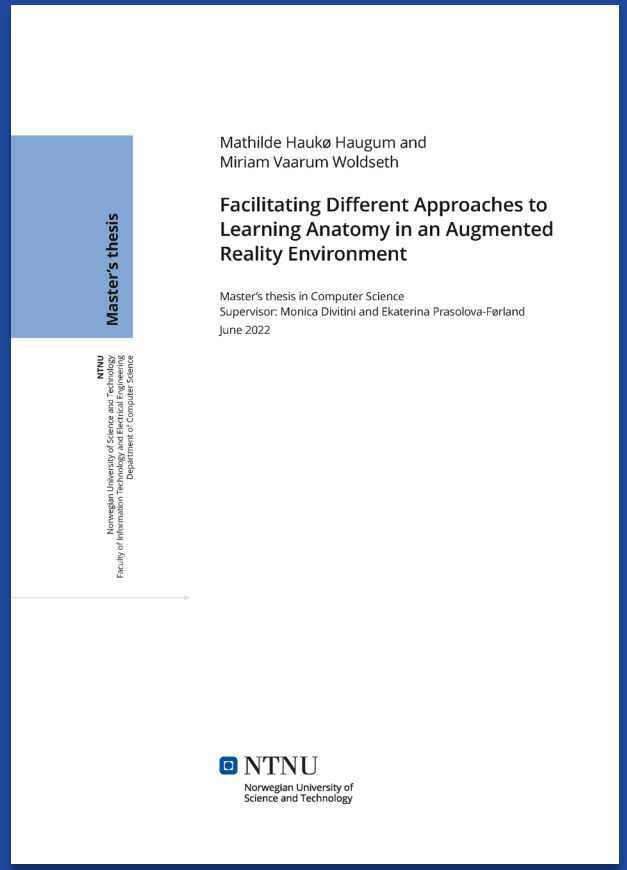


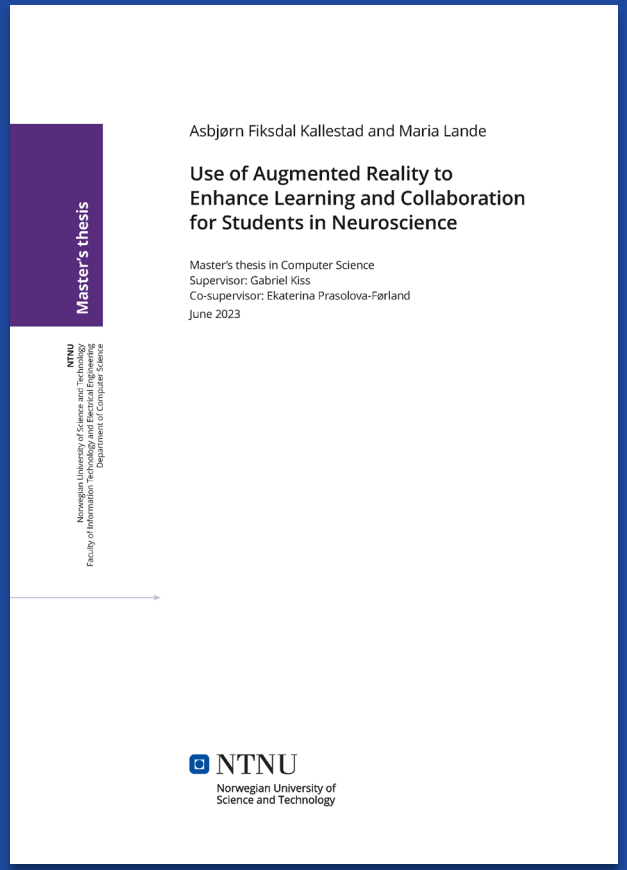
Neocortex



Home Task Catalogue Dissect

Master’s theses





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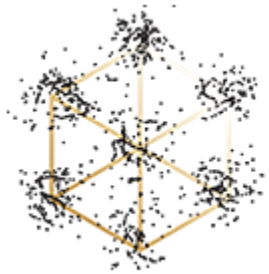
iPEAR

Erasmus+



Kavli Institute for Systems Neuroscience

Virtual Reality for Career Guidance and Vocational Education and Training

https//:vr4vet.eu


Observe the fish:
- They swim up to eat when they are hungry.
- They swim down when they are full.
- The feed will fall to the bottom when the fish are full.
Use the control panel on the table to adjust the camera and the amount of feed given to the fish.
There are three fish cages, and you have to keep an eye on all of them!
Press Ⓐ to start the game
Time left: 0:00
Cage 3
Score: 0
YOUR SCORE:
1
2
3
HIGH
MED
LOW

Master’s theses

Master's thesis

Jørgen Henrichsen

Engaging Young Job Seekers with an Internship as a Wind Turbine Technician in Virtual Reality

Master's thesis in Computer Science
Supervisor: Monica Divitini
June 2019

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Master's thesis

Christian Bernard Bouwhuis Røkke
Simen Ulvestad

Career Guidance in Collaborative Virtual Reality

A Design and Creation Research project exploring the effects that collaboration has on virtual reality career guidance, both remote and co-located.

Master's thesis in Informatics
Supervisor: Monica Divitini
June 2020

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Master's thesis

Aleksander Johansen & Eivind Alfsvaag Johansen

Enhancing System Usability for Immersive Job Taste with CarpenterVR

Master's thesis in Computer Science
Supervisor: Monica Divitini
Co-supervisor: Ekaterina Prasolova-Førland
June 2022

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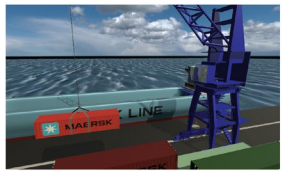
Norwegian University of Science and Technology

Master's thesis

Robert Eric Maikher

How to create accessible Virtual Reality (VR) experiences to aid young job seekers with career guidance

Master's thesis in Computer Science
Supervisor: Monica Divitini
Co-supervisor: Ekaterina Prasolova-Førland
July 2021



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Master's thesis

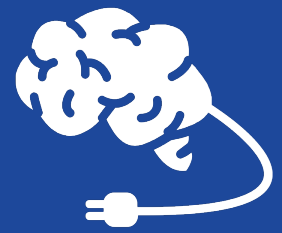
Magnus Baugerud

Investigating the Use of Immersive Virtual Reality for Fish Welfare Training and Awareness

Master's thesis in Computer Science
Supervisor: Monica Divitini
Co-supervisor: Ekaterina Prasolova-Førland, Mikhail Fominykh
June 2023

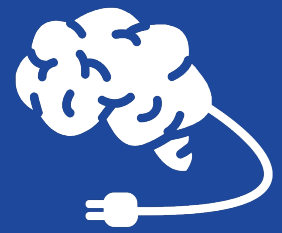
NTNU
Norwegian University of Science and Technology

Practical considerations for use



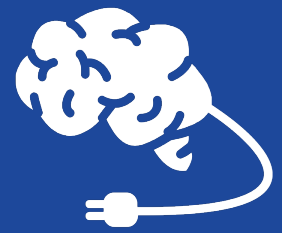
- Physical space
- Hardware purchase, storage, maintenance, and replacement (repair)
- Hardware cleaning, charging, and checking
- Hardware and software responsibility: IT services vs. teaching staff
- Software search, purchase, installation, and update
- Software licenses
- **Managing equipment**: lab-centered vs. BYOD
- **Managing accounts**: organizational vs. per device vs. user accounts

Practical considerations for development



- **Managing goals**: student aim for high grade and learning vs. projects aim for data and working apps
- **Storing/reusing the code**: GIT for student projects
- **Student project symptoms**: high technical debt, poor documentation
- **Publishing and distribution of apps**
- **Ownership and copyright**: students own their work vs. universities own the work of staff

Knowledge and experience



> Innovators and Early adopters

> Organizational networks

> AR/VR user skills

> AR/VR development skills

AR/VR User skills

Teacher education module

Teaching in immersive learning environments

Reflecting on the affordances of immersive technologies to supplement teaching in higher education

understanding of pedagogical approaches most commonly associated with educational immersive technologies and the best practices that can help them use immersive technologies successfully in their teaching

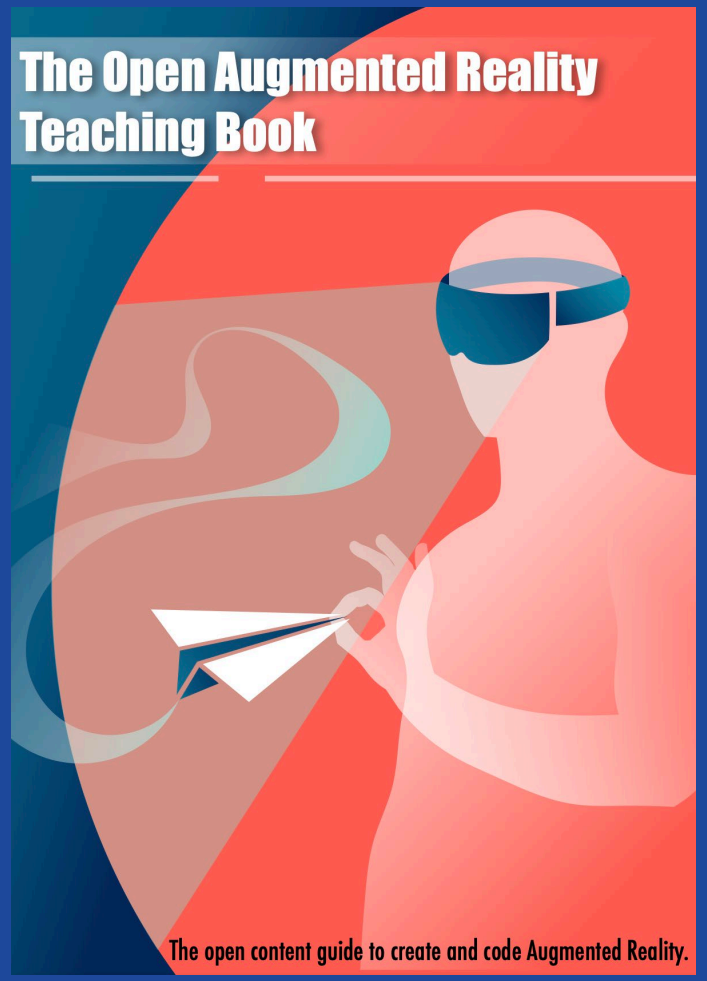
Continuing education course

Theory
Introduction to VR
Introduction to AR
Application domains: education
Working with XR developers
Procurement of XR solutions

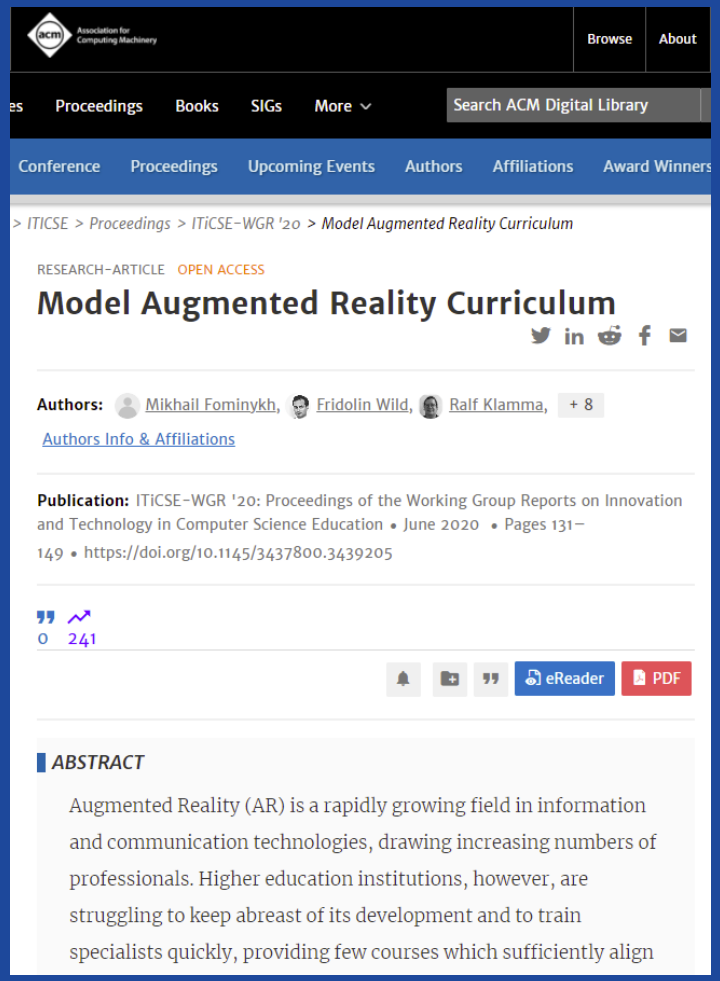
Practice
Experience with XR hardware
3D / XR content
XR authoring tools

Project
Introduction of XR to organization

AR/VR Development skills



https://codereality.net/ar-for-eu-book/



https://dl.acm.org/doi/abs/10.1145/3437800.3439205

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