ABOUT Augmented Reality

Augmented reality (AR) is an innovative technology encompassing a wide spectrum of techniques for projecting computer-generated materials, such as text, images, and video, onto users' ordinary unaided perceptions of the real world. AR superposes overlays of virtual objects or information on physical objects or environments, resulting in a mixed reality in which virtual objects and real environments coexist and are coordinated with one another; thus, AR, with its layering of information over 3D space, creates new experiences of the world, which can augment learning experiences.

Acknowledging the importance of engaging in real-world experiments enhanced by simultaneous data collection and presentation, and in the light of the importance of inquiry-based learning, the symposion seeks to explore the role of Augmented Reality Technology for the mathematics classroom.

Presentations

Design principles of AR rich environment to model real-world phenomena
Osama Swidan, Israel

Embodiment and multimodality: blurring boundaries with AR
Cristina Sabena, Italy

The logic of Inquiry when using AR
Carlotta Soldano, Italy

The role of AR for the teaching and learning of mathematics
Florian Schacht, Germany

Discussion

Venue

The Symposion will be held at the University of Duisburg-Essen in the city of Essen, Germany. The Ruhr metropolis is full of surprises, one of which has been its cultural transformation from a traditional industrial region to a European Capital of Culture and home to 5.3 million people from 140 countries.

FURTHER INFORMATION

Attending the symposium is free of charge

If you need any information, please do not hesitate to contact Florian Schacht via **florian.schacht@uni-due.de**.

UNIVERSITÄT DUISBURG ESSEN
Offen im Denken

International Symposion on Augmented Reality in Mathematics Education

30 January, 2020
9-12 Uhr
WSC Essen
Thea-Leymann-Str. 9
5th floor

izfb
Interdisziplinäres Zentrum für Bildungsforschung

UNIVERSITÄT DUISBURG ESSEN
Faculty of Mathematics

Abstracts

Design principles of AR rich environments to model real-world phenomena
Osama Swidan, Israel
Augmented static objects with virtual-dynamic objects is the common use of augmented reality (AR) technology in education setting. In our project, we are using AR in a different way. We are using AR to collect real-time data of dynamic objects (a cube moving on an inclined plane) and layered the dynamic objects with mathematical representations that describe the movement of the object. The design of such an AR environment was not smooth, but it accompanied by many challenges. In my talk, we will take you on the design journey of the environment and I will share with you the challenges and how we treated them.

Embodiment and multimodality: blurring boundaries with AR
Cristina Sabena, Italy
Research results in different fields show that our body plays a crucial role in the way we develop our scientific knowledge and communicate it. On the other side, AR devices used in our study provide highly structured mathematical signs in the students' peri-personal space. In the seminar I will investigate this relationship, taking a multimodal semiotic perspective and considering some data coming from our first experiments with AR.

The logic of inquiry, abductions, strategic thinking when using AR
Carlotta Soldano, Italy
The ability to "reason well" cannot be directly taught, it is acquired, developed and improved through inquiring activities. AR devices offer the possibility to do mathematical inquiry within real world experiments. In the seminar, I will analyse students' reasoning while are engaged in mathematical AR activities in order to show how this device can support a "logic of inquiry approach" towards mathematics.

The role of AR for the teaching and learning of mathematics
Florian Schacht, Germany
The exploration of functional relations is a complex conceptual challenge for many students: On the one hand, such relations are connected to dynamic views on the mathematical concepts, on the other hand they are linked to multiple representations that need to be connected. One possibility to explore functional relations is by conducting real experiments. The talk will discuss the role of using Augmented Reality technology for conducting such experiments. AR Technology is used in the setting of the empirical project to augment dynamic processes and real experiments, so that the underlying functional relations can be experienced in different representation modes by the students.

FURTHER INFORMATION

If you need any information, please do not hesitate to contact us via **florian.schacht@uni-due.de**.