IO3

Augmented Elements

MaSCE³ MathCityMap

Co-funded by the
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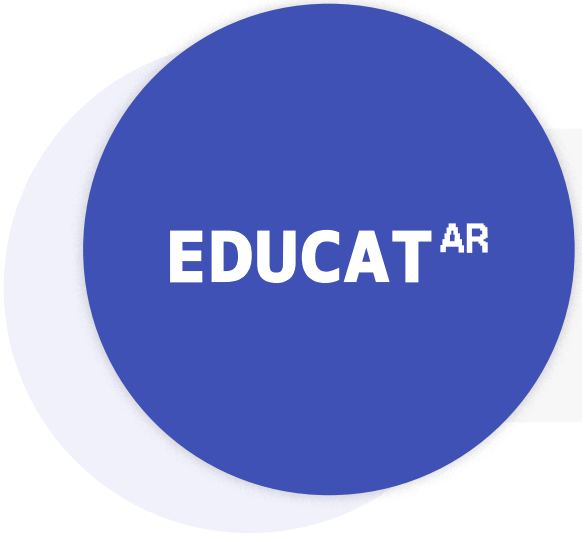
of the European Union

On *educatar.eu*, educators can create...

Augmented Reality (AR)

...scenes. An AR scene enhances real-world environments by blending in virtual elements when viewed through the camera of a mobile device. AR scenes can be used in MathCityMap to provide information in support of real-world objects in a motivating, playful and exciting way.

Understanding



educatar.eu allows text, images and videos to be displayed as AR elements; the use of multiple AR elements (e. g. two images and one text element) in the same AR scene is possible. Furthermore, creators have a choice between AR scenes to be triggered by GPS-coordinates (GPS-based scenes) or by a pre-defined view (marker-based scenes):

GPS-based scenes

GPS coordinates determine the location at which the AR scene is available. In order to view the AR element, one has to be in the vicinity of these coordinates and search the environment through the camera of a mobile device.

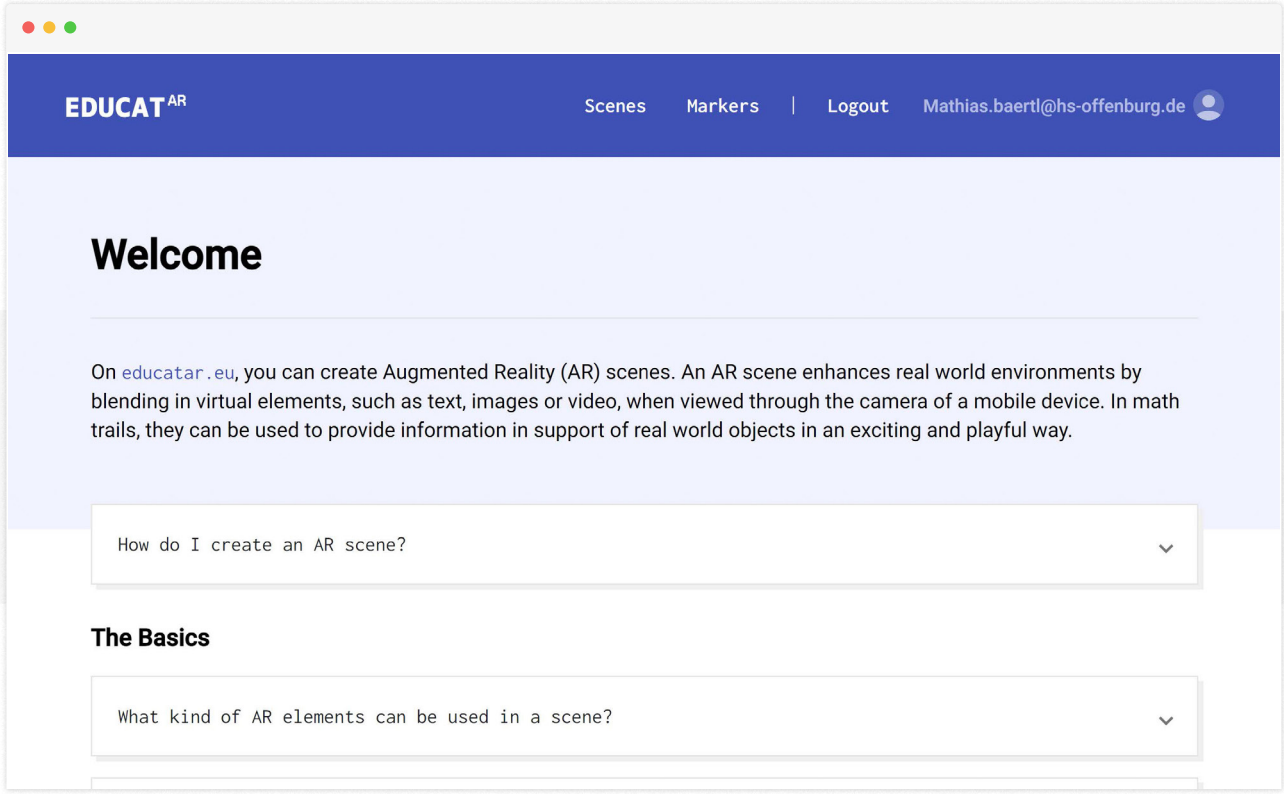
Marker-based scenes

Any object (e. g. a door sign, a statue, a painting) can serve as a marker. The creator of a math trail has to provide the system with a photograph of that object. When the camera of a mobile device is directed at the object, the AR element will appear overlaid on top of it.

educatar.eu is free to use for anyone. However, registration (name, email, password, optional: city, country and institution) is required. The following pages introduce the capability and provide guidelines on how to use it. For a demo, all information contained in this document is also available in video format!

Introduction

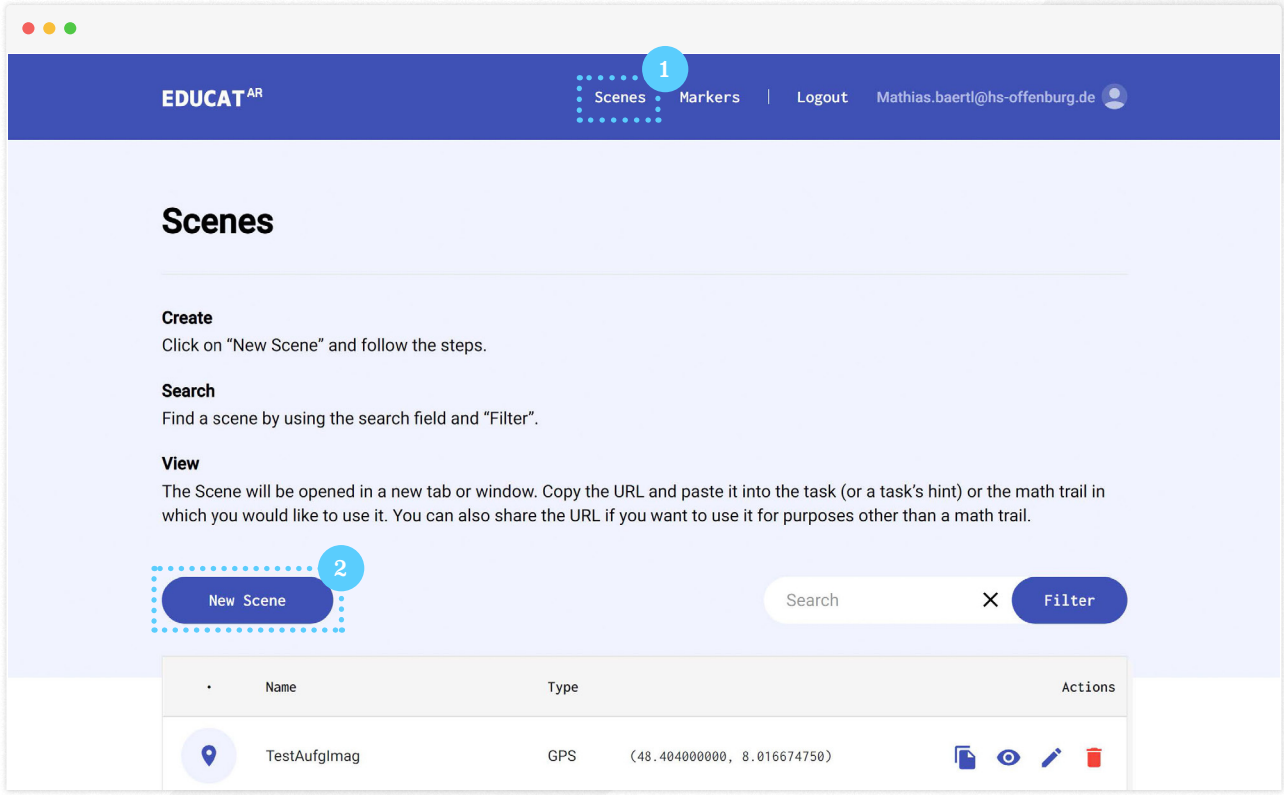
The Welcome page offers a **brief guide** on how to use the application.



Overview

“Scenes” is the place where a creator’s AR scenes are listed. Here, one can also **create new scenes**:

Click “New scene” to open the creation page, including step by step instructions on how to proceed.



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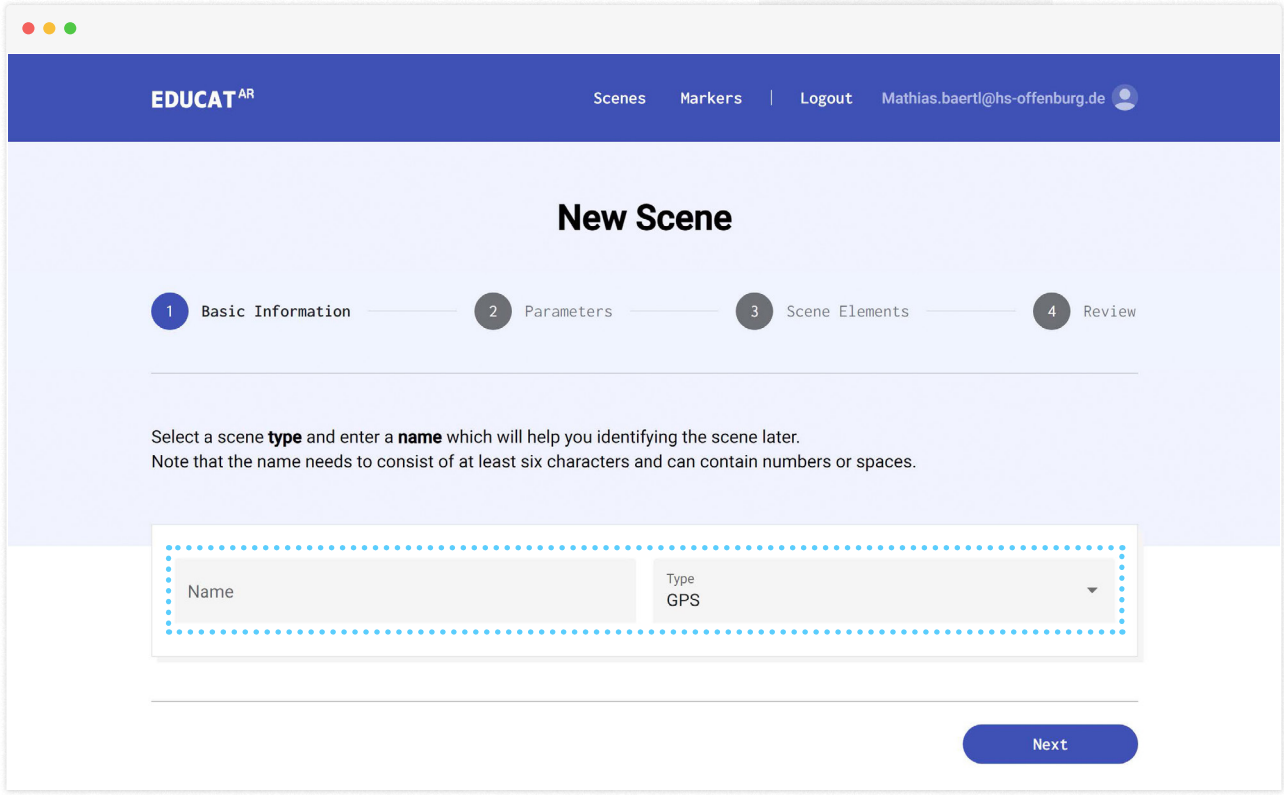
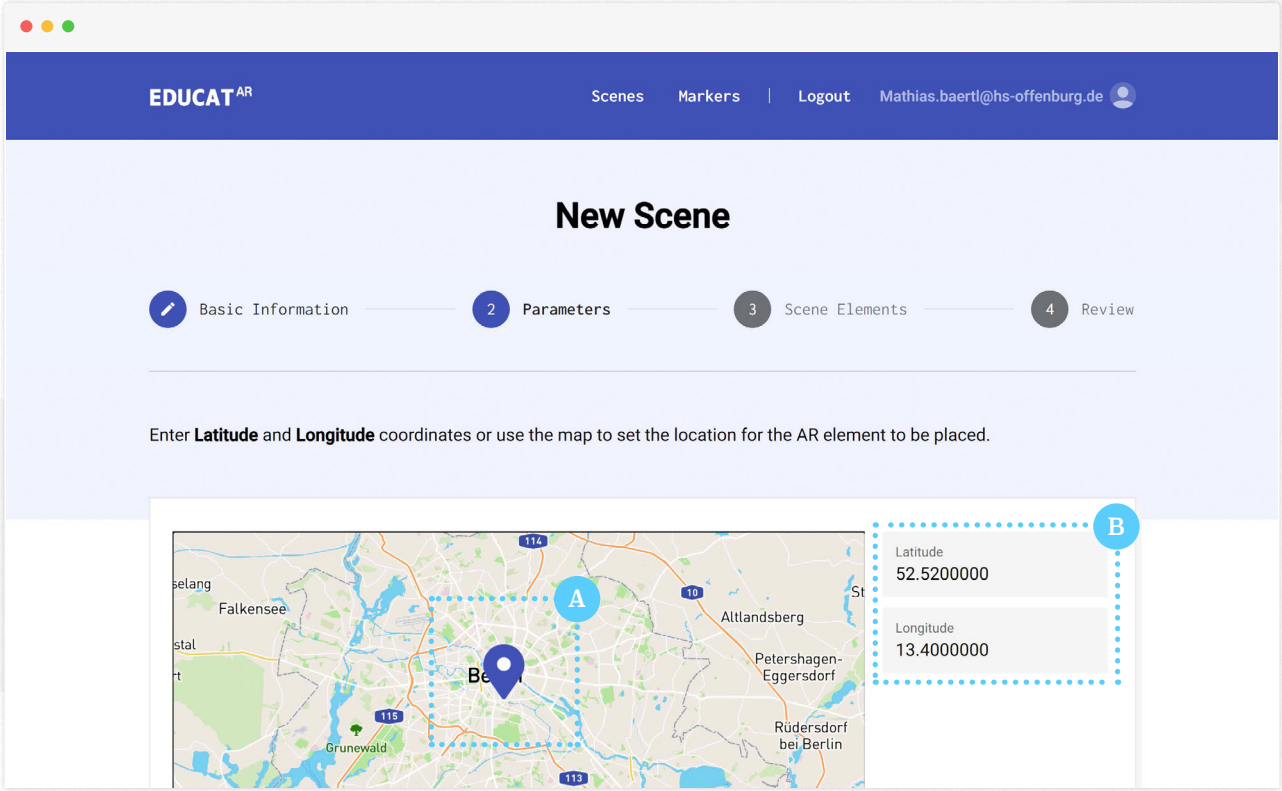
Basics

Each scene requires a name of at least six characters (letters, numbers and spaces; special characters are not permissible). Select “GPS” or “Marker” to **determine the type of AR** trigger.



Parameters [GPS-Based]

For GPS-based scenes, select the coordinates by clicking on the desired location on the map (zoom in or out as required) or by entering latitude and longitude values.



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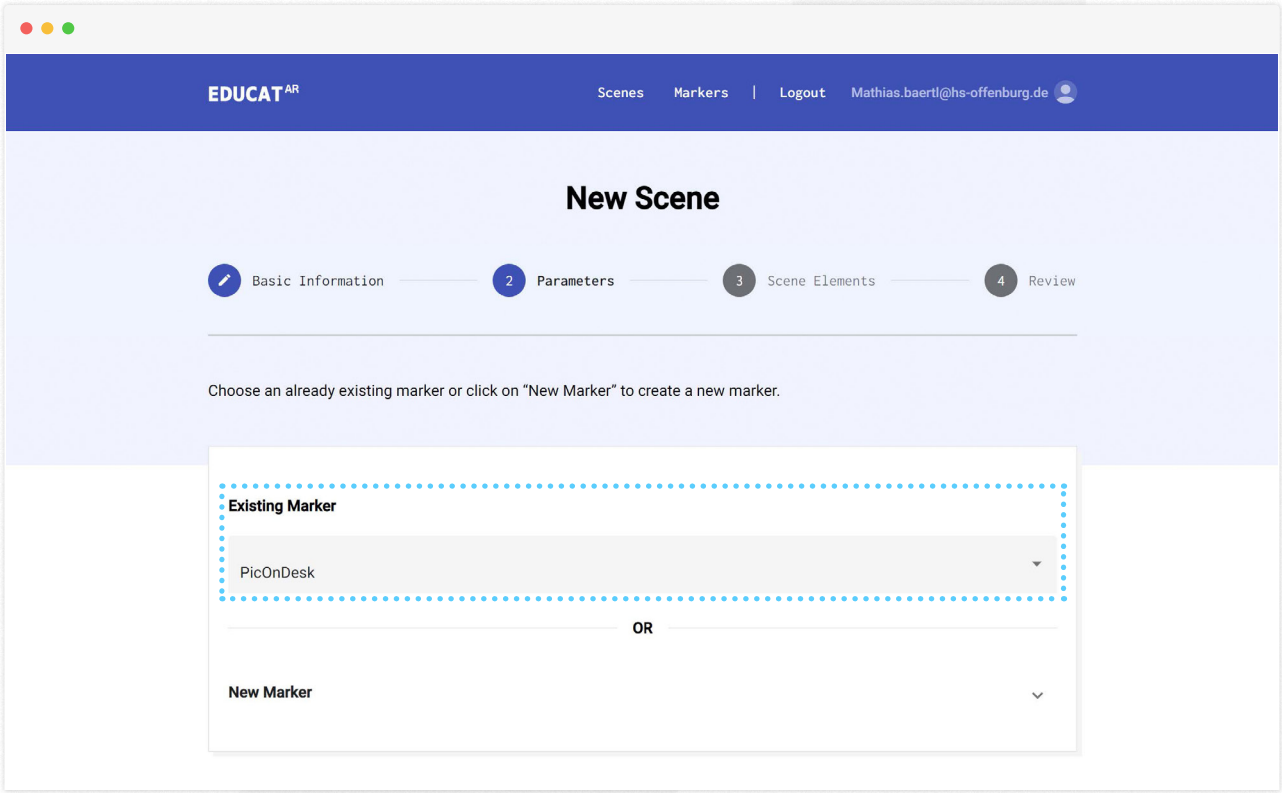
Parameters [Marker-Based]

For a marker-based scene, either select an already created marker from the list of your existing markers, or ...



Parameters [Marker-Based]

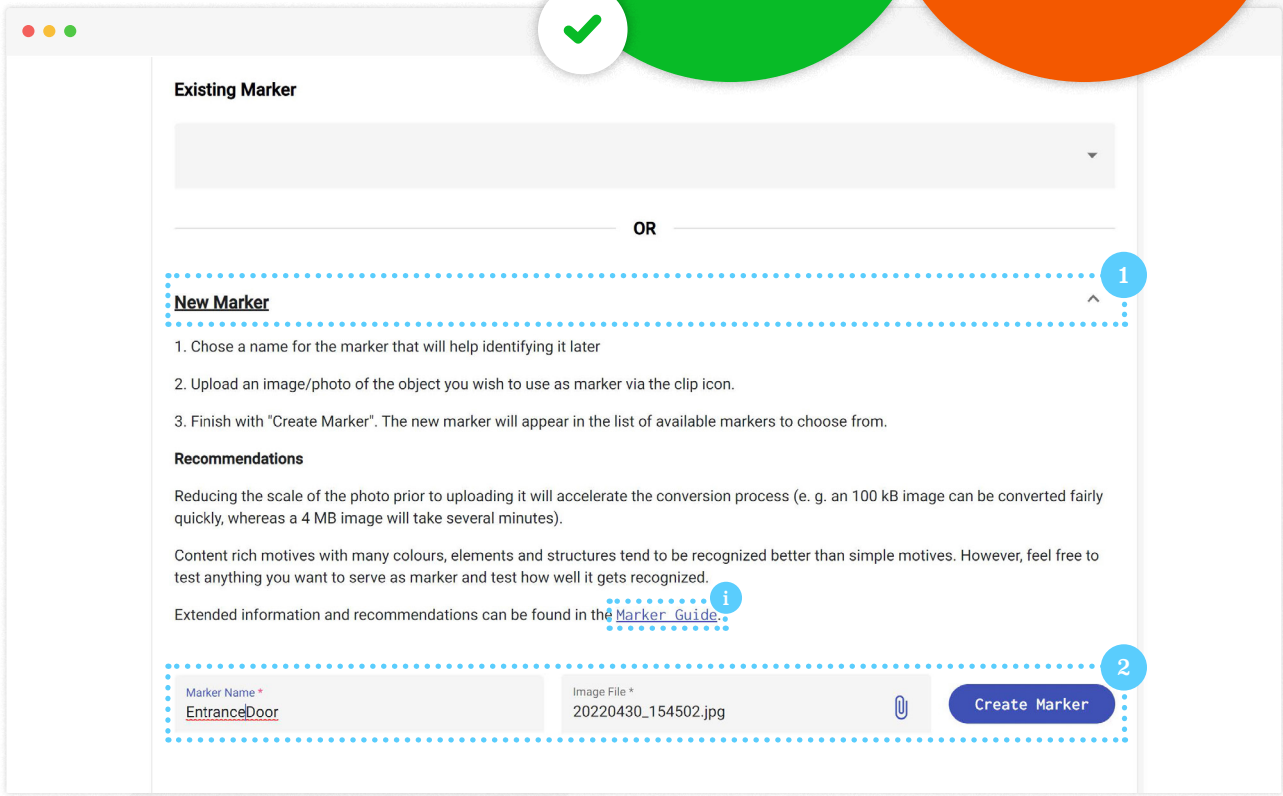
Aim for
- two-dimensional motives
- lots of details
- various colors
- stable lighting

Avoid
- overly simple motives
- commonplace signs
- obejcts appearing differently under changing lighting conditions

… create a new marker: Choose a name and upload a photograph (click the paper clip symbol) of the motif which is to serve as AR trigger.

It is recommended to scale the marker image (i. e. the photograph) down in size (e. g. 25% of its original resolution) prior to the upload to accelerate the conversion process.

“Create Marker” generates the marker. Check the “Marker Guide” to get some advice and guidelines on marker design, including examples.



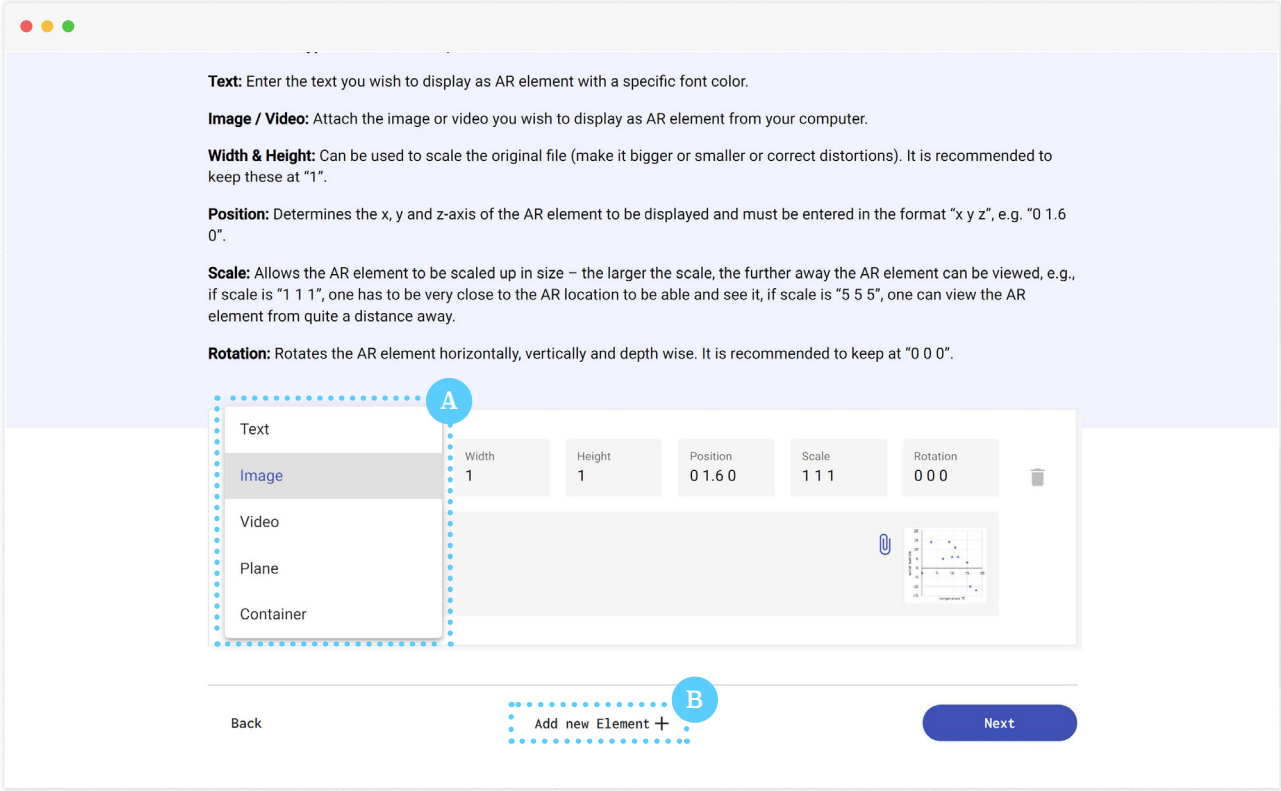
Elements

Select whether you want to show text, an image or a video as AR element (plane and container are experimental for the time being).

For text, type the desired information in the respective field and choose a font color.

For images or video, click the paperclip symbol and find and select the file on your computer.

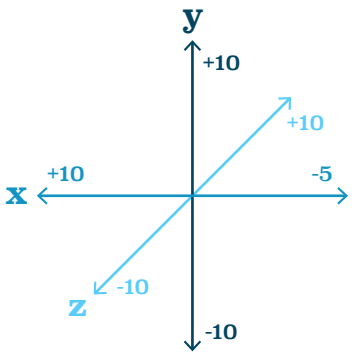
You can add more than one AR element to the same scene by clicking “Add new Element”.



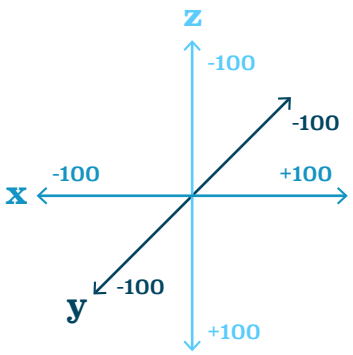
Element Settings

The appearance of AR elements can be manipulated through a range of parameters. They are in a prototype state and work differently for GPS-based and marker-based AR scenes. In some cases, they are not functional at all. *educatar.eu* is configured to offer, depending on the application, working default settings. It is recommended to start with the default settings and fine-tune according to the following guides:

GPS-based



Marker-based



Width and Height

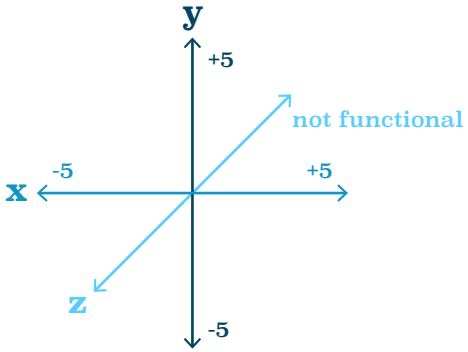
These values can be ≥ 0 and scale the size and ratio of an AR element.

Position

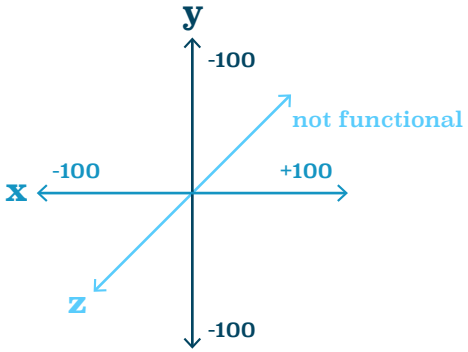
Position determines where, in relation to a viewer's camera, the AR element is displayed. It allows to move the AR element left or right, up or down and closer to or further away from the viewer.

Element Settings

GPS-based



Marker-based



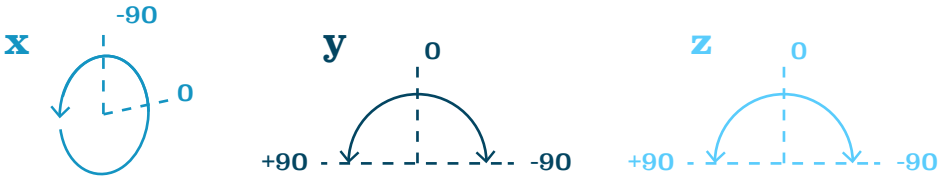
Scale

Scale allows to change the width and height of an AR element (and is, to some degree, redundant with the width and height parameters). Using a negative value will cause the object to “flip”.
The depth parameter is not functional for 2D elements.

Rotation

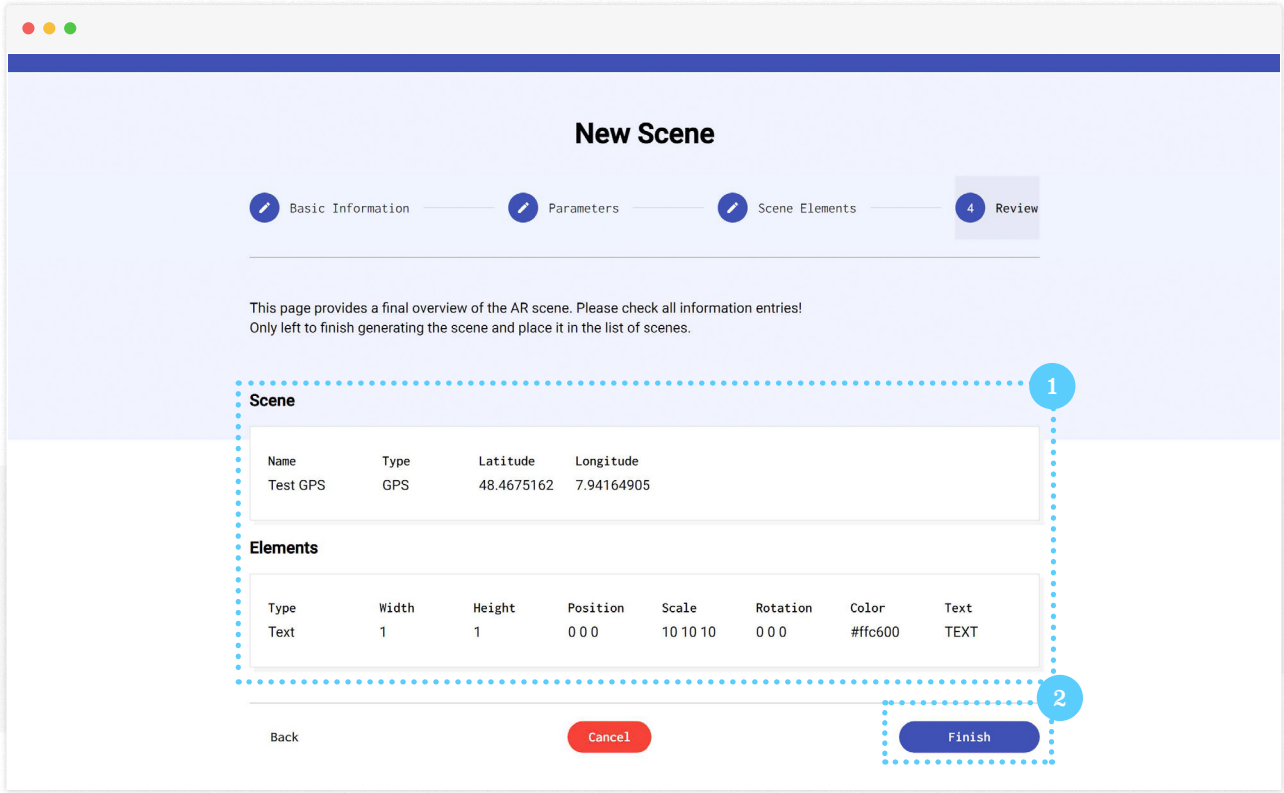
Rotation is **only** functional for **marker-based** AR scenes. Setting the x-value to 0 will cause the AR element to “lie flat”, making it difficult to see. A value of -90 will make it “stand upright” in front of the viewer.
The y- and z-value (redundantly) allow to rotate the AR element clockwise or counterclockwise.

Marker-based



Preview

The review page provides a final overview of all settings. Create the scene by clicking “Finish”. “Cancel” or return to any previous step by clicking on the respective button.



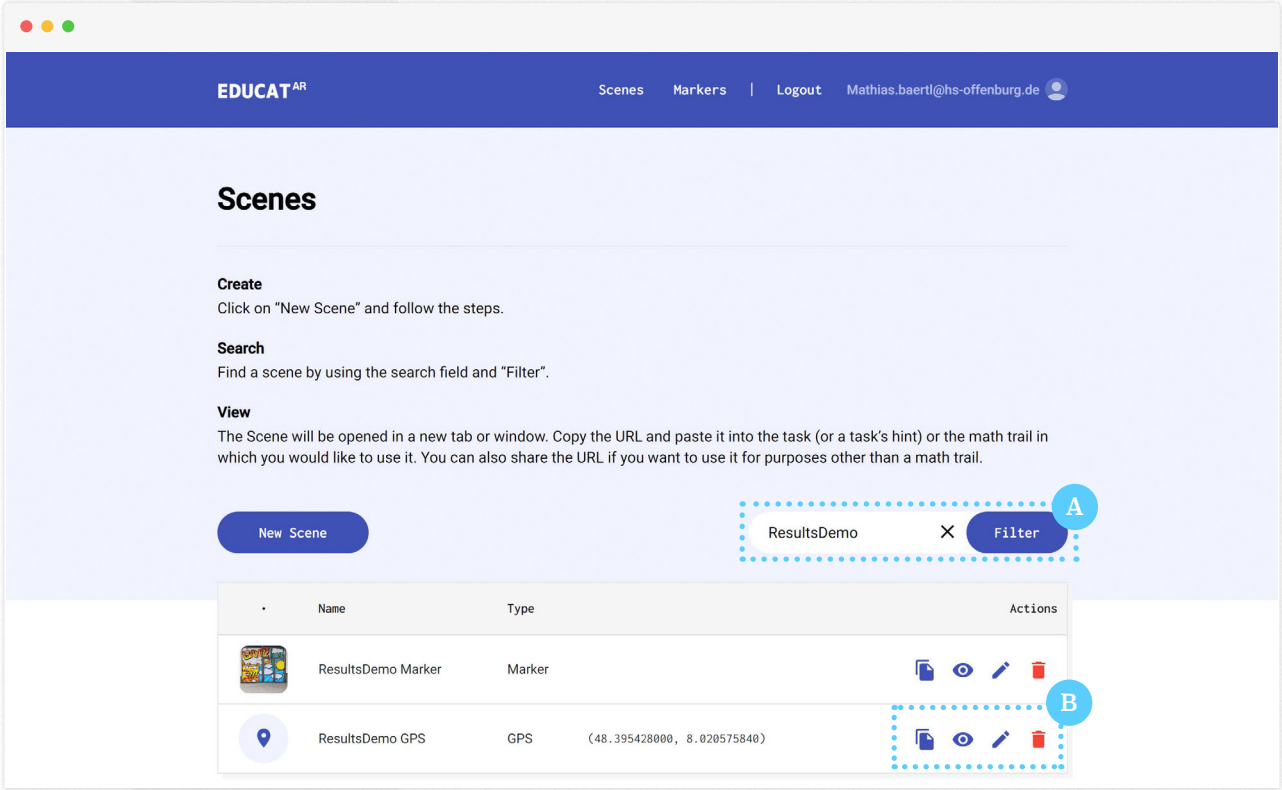
Actions

Scenes appear on the scenes page.

Use search and filter to find scenes.

Actions

1. Copy a scene's URL to insert it into the hint of a MathCityMap task and make it part of a trail.
2. The „view“ button opens the scene in a new browser.
3. The „modify“ button allows each element of an AR scene to be changed.
4. The „bin“ button deletes the scene.



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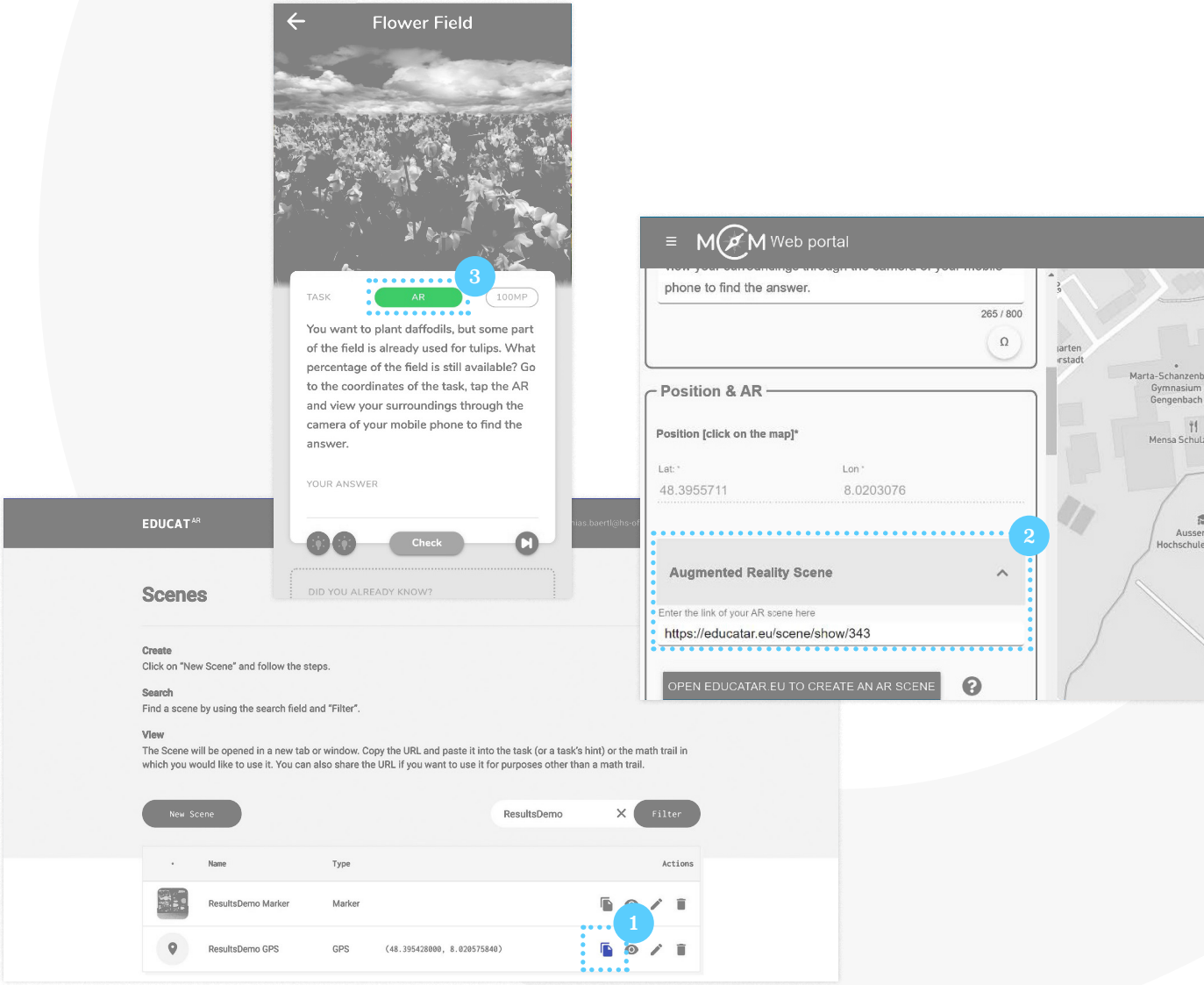
Integration

To integrate an AR scene in a MathCityMap trail...

1. **Copy the scene's link.**
2. **In the MathCityMap web portal, paste it into the "Position & AR" section.**
3. **In the MathCityMap app, an AR button will be displayed. Tap it to view the scene (opens browser and camera; swipe back to return).**



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IO3: Augmented Elements

masce.eu / mathcitymap.eu/portal

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