AR-App Radiation Protection

Augmented reality (AR) is when a real image is virtually augmented. In the case of an AR app for smartphones, the camera records the real environment and the image is overlaid with a virtual extension on the display. The presented app works with so-called image markers, which are recognized by the app and with the help of these virtual objects are inserted into the camera image. The app can be used to conduct a school experiment with radioactive samples virtually. For this purpose, there are three image markers representing a radioactive source, shielding material and a detector. The following samples from the classic school experiment were chosen as templates: Sources: Am-241 a = 0.49 kBq, Ra-226 a = 60 kBq, Sr-90 a = 2.87 kBq and Co-60 a = 41.8 kBq; shielding materials: iron, lead, concrete, polyethylene, aluminum. The thickness of the shielding material can be varied. As a supplement to the classical school experiment, the app can visualize the propagation of radiation in two ways. On the one hand by emitted particles or waves and on the other hand a colored background showing the intensity of the radiation depending on the distance to the source.

Requirements

Smaprthone with Android operating system version 7 or higher **or** IPhone/IPad
PDF reader, printer and scissors to print and cut out the image marks

Installation

The app for Andriod can be downloaded here. Since it is an app that has not been downloaded from the official Appstore, it must be confirmed that you trust the creator. Also, the app must be allowed to have access to the smartphone's camera in order to run.

For iOS devices you find the app here in the Appstore.

Function

Once the app detects the image markers, it places the corresponding object over them and remembers the position of the object. The image markers can be moved, but sometimes moves are not registered directly, in such a case the camera must be moved closer to the marker, so that the new position is adopted.
At the top left of the screen is the language selection, by clicking on the flag the selection opens and the language can be selected. By clicking again on the flag in the left corner, the selection closes again. The same applies to the menu in the upper right corner. The menu is marked by three dots, outlined in green in Fig. 1, where it is possible to select whether the names of the specimens are displayed, which visualization of the radioactive radiation is displayed and to adjust the details of the visualization. If the app does not run smoothly, it is recommended to reduce the quality.

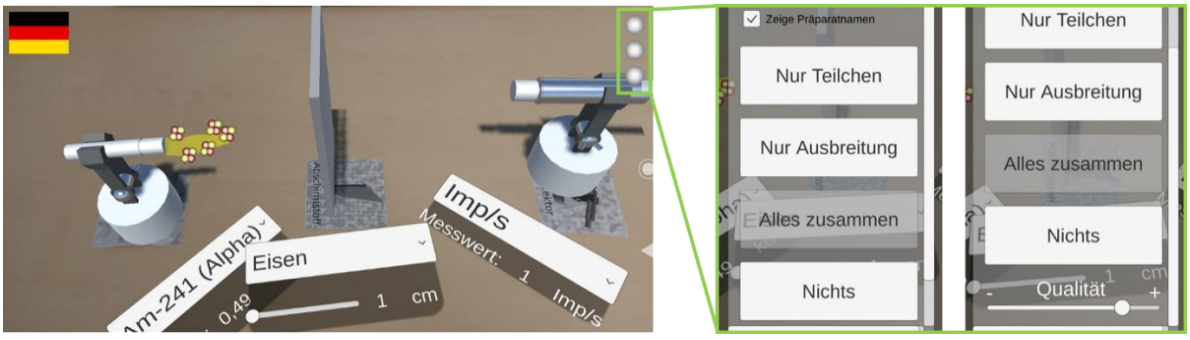

Abb. 1: Options in the AR app: top left language selection. Top right (green border) selection of display of preparation names, visualisation and details.

If you have any questions or problems with the app, please feel free to contact us at cinch@irs.uni-hannover.de. We can also provide suggestions for using the app in physics classes.

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