



Action E2 - Technical Dissemination Activities

Virtual Cave Exploration Application - VR

INSTRUCTIONS

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University of Crete & NHMC
ATEPE Ecosystem Management



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ΠΡΑΣΙΝΟ ΤΑΜΕΙΟ

Με τη συγχρηματοδότηση της Ευρωπαϊκής Επιτροπής
Με τη συγχρηματοδότηση του Πράσινου Ταμείου
Με την υποστήριξη του Ιδρύματος Α. Γ. Λεβέντη και του Ιδρύματος Σταύρος Νιάρχος



CONTENTS:

ABSTRACT

A. Available files

B. Instructions for installing the software on the equipment

C. Instructions for starting the application:

D. Suggestions for selection, purchase and use of appropriate equipment – VR



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Abstract:

For the first time in Greece, a multimedia virtual reality application was created to present the cave habitats and their life. The aim of this particular action was to create an alternative way to demonstrate/present cave habitat without the physical presence of visitors inside caves. Through the app, the user has the opportunity to briefly feel the joy of exploring a cave and the life it hosts.

A realistic digital model of a hypothetical cave was created using photogrammetry from visual material collected from two caves: the Paleomylos (Akraefnio, or Aliartos) sinkhole in Voeotia and the Okso Latsidi cave in Sitia in Eastern Crete. Photographic textures from the shots were incorporated into the digital model, while gaps and discontinuities were corrected with the intervention of a special 3D artist.

Rich audiovisual material and information about the cave habitat and the life it hosts was incorporated into the application created. The user has the possibility to explore the cave with the help of a virtual life detection device ("Life scanner N2000") on which are reproduced depending on its position: ultrasound of bats translated into the acoustic spectrum by special detection devices (bat detector), macro shots of cave invertebrates, photos and videos of bats and their colonies.

The application will be used in demonstration at three selected information centres (Cave of Lakes at Kastria Acaia, Pozar Baths Loutraki, Almopias and NHMC exhibition in Heraklion, Crete). The application will also be available via the project website together with installation instructions on stand-alone virtual reality devices (VR headsets).

A. Available files

The following files are available on the project website [<https://www.lifegrecabat.eu/el>]:

1. **Application installation files** (a, b) [.apk / 320 MB respectively] on virtual reality systems.
 - a. **Short version** of the virtual exploration application intended for use in school visits.
 - b. **Free roam** intended for use in situations where there is available browsing time.
2. **Promotional version** of the virtual exploration for PC and Smartphones lasting 3:38 minutes.
3. **Game play** of the virtual exploration application



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B. Instructions for installing the software on the equipment

To install the apps on Oculus Quest, the following procedure must be followed:

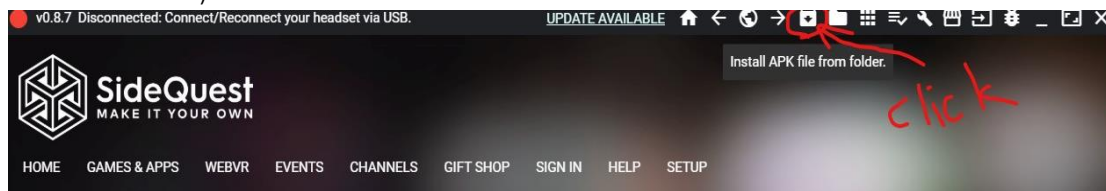
You will need:

- (a) A personal computer (PC).
- (b) The Oculus Quest device.
- (c) The apk files of the 2 applications.
- (d) A simple Android phone USB-C cable [because the cable in the Oculus Quest package only allows charging and not data transfer].

For installation follow the steps below:

The following procedure must be followed to install the applications on the Oculus Quest:

1. You need (a) a PC, (b) the Oculus Quest, (c) the apk files of the 2 apps, and (d) a simple USB-C cable of an Android phone, because the cable in the Oculus Quest package only allows charging and not data transfer
2. The apk files of the applications must be extracted to a PC
3. Connect the Quest to the PC with the USB-C cable
4. Once connected first time you will need to wear the Quest (as it is with the cable) to press accept connection
5. Download the SideQuest app from <https://sidequestvr.com/#/download> and install it on the PC.
6. See here <https://sidequestvr.com/#/setup-howto> in case you also need to follow steps 3, 4, 5 to connect to the app as well
7. Then if everything is ok and it is connected correctly SideQuest will have a green light at the top left
8. To install click on the top right button that says "Install APK file from folder" (see screenshot)



9. To see the installation progress press the button on the right labeled "Running Tasks"
10. When the installation is finished the app will be in Quest in the "Library" section and in the sub-section "Unknown Sources"
11. Unplug the cable and select the application you wish to view.



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C. Instructions for starting the application:

1. Turn on Quest (side on/off button)
2. When it opens tap on the 2 controllers the triggers or the oval Oculus logo to open them too.
3. Select reset guardian (your 1.5m limits) following the in-screen instructions, ie:
4. Leave one controller at floor level, press confirm within the screen.
5. You set boundaries by pressing the controller trigger and drawing a circle around you with a radius of at least one meter and as far as the space allows.
6. To find the LIFE GRECABAT applications you installed go to the menu (oval Oculus logo with the controller) and go:
 - a. Navigate ↓
 - b. Libraries ↓
 - c. Unknown sources ↓
 - d. Select short version or free roam [depending on the administrator's suggestion] ↓

You have started your tour...

D. Proposals for the selection, purchase and use of appropriate equipment – VR

The selection of the environment and the device of the application was based on the following criteria during the design of the specifications of the action and in collaboration between the **LIFE GRECABAT** team and **Bolt Virtual** [subcontractor] who designed and implemented the application.

1. To be sufficiently immersive to perform its role as a demonstrative (low-cost) alternative to a real cave visit.
2. Easy to use and can be easily - inexpensively integrated into cave information centres, museums etc. (many devices).
3. Implemented by stand-alone devices without the need for additional hardware or internet connection.
4. The device can be easily portable and used by multiple users within their activities.

Considering the parameters of cost, usability, availability and technical features, the recommended VR system is the Oculus Quest 64GB.

Complementary for the use of the systems in information centers will be needed:

1. Silicone covers for the parts of the headset that touch the user's face, which will be cleaned with antiseptic wipes before each individual user uses the headset [3 covers per headset are recommended].
2. Silicone pouches for the VR system controls, of equivalent use to the above [2 sets per VR system are proposed].



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3. Headsets: not necessary, but may help create an immersive user environment.

Each VR system shall be installed in an area that has the following specifications:

1. Shaded and without the user and equipment coming into contact with direct sunlight. Indirect sunlight within the room does not create a problem in the operation of the equipment.
2. Necessary space with a radius of about 1.5 meters around the user.
3. At the edges of the 1.5-meter radius there must be a small table on which the VR system, its cleaning equipment, as well as a power supply, can be placed.
4. The Oculus Quest has a battery autonomy of 2-3 hours during which time it can be used without a power connection. If the battery level is low there is an option for users to use it simultaneously while connected to the charging cable, which is 3 meters long.
5. It is necessary to have available: (a) alcohol wipes (**which under no circumstances should be used on the lenses**) to sterilize the headset cover and controls, as well as the hands of the user and the information centre employee, and (b) facial wipes which are used to remove users' sweat from the headset.



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