User Manual of the Rescuer Application

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Introduction to metaverse and spatial.io platform.

The idea of the metaverse has become one of the most prominent technological visions of the early twenty-first century. It describes a persistent, shared, and immersive digital environment in which people can interact with each other and with virtual objects in real time. Unlike traditional online platforms that are limited to two-dimensional screens and text-based communication, the metaverse aspires to create a sense of presence by merging elements of virtual reality, augmented reality, and three-dimensional design into a unified ecosystem. In this environment, users are not simply observers of information but active participants who can socialize, work, learn, create, and trade in spaces that simulate aspects of the physical world while also introducing entirely new forms of experience that would be impossible offline. The term itself gained wide attention through science fiction, but today it has become a subject of serious research and business investment, encompassing fields such as human–computer interaction, digital economics, game design, education, and collaborative work. At the core of the metaverse lies the concept of immersion. Through virtual reality headsets, spatial audio, and interactive avatars, users gain the ability to feel as though they are “inside” the digital world rather than looking at it from the outside. This sense of embodiment is enhanced by social presence, as avatars mirror gestures and voices to create the impression of face-to-face communication. The metaverse is not limited to entertainment, although gaming has been one of the earliest drivers of immersive technology. It also represents a shift in how people may work remotely, conduct academic research, participate in cultural events, and even design new forms of governance and economic exchange. Digital assets such as non-fungible tokens, blockchain-based currencies, and virtual goods are increasingly integrated into these spaces, providing both symbolic value and real financial significance. As such, the metaverse is not a single product or platform but a broad technological and cultural phenomenon under active development. Within this emerging landscape, Spatial.io stands out as one of the most accessible and innovative platforms dedicated to enabling metaverse experiences. Originally conceived as a tool for immersive design collaboration, it has evolved into a full-fledged virtual environment that allows individuals, teams, and organizations to create their own interactive spaces. Spatial.io operates directly through a web browser, which significantly lowers the barrier to entry by removing the need for high-end software installations. Users can also access the platform via mobile devices and virtual reality headsets, making the experience adaptable to different levels of immersion. This multi-

platform availability has been one of Spatial's defining strengths, ensuring that communities can gather without technical constraints and that events can scale to reach diverse audiences. The platform enables the creation of customized three-dimensional rooms that function as galleries, meeting halls, classrooms, or social hubs. Within these spaces, users can place digital objects, share multimedia content, and arrange interactive elements that support communication and collaboration. A key feature of Spatial.io is its emphasis on avatars, which can be generated from photographs to produce lifelike digital representations of users. These avatars are not static; they are animated in ways that reflect speech and movement, which enhances the sense of presence and authenticity during interactions. The ability to host and attend events in Spatial.io has made it particularly attractive for creative industries, educational institutions, and enterprises seeking new ways to engage communities. Exhibitions, product launches, conferences, and workshops can all be conducted in a visually rich environment where participants can navigate freely and engage with content in three dimensions. From a pedagogical perspective, Spatial.io demonstrates how the metaverse can transform the learning process. Instead of being confined to video calls or two-dimensional slides, educators can create immersive classrooms where abstract concepts are visualized in spatial form. Students can interact with models, participate in collaborative tasks, and engage in discussions that feel more natural than standard online communication. This is particularly relevant for disciplines that benefit from visualization and experiential learning, such as architecture, medicine, and engineering. At the same time, Spatial.io can serve as a cultural platform where museums and artists showcase digital exhibitions that reach global audiences without geographical restrictions. By combining accessibility with immersion, it blurs the line between education, art, and social engagement. Spatial.io also reflects the ongoing convergence of web technology and immersive computing. While many virtual reality platforms require high-performance hardware and complex setup, Spatial leverages WebXR and cloud infrastructure to provide seamless access. This approach aligns with the broader vision of the metaverse as an interconnected network of digital worlds rather than a collection of isolated applications. The emphasis on interoperability and openness is crucial, as the long-term success of the metaverse depends on the ability of users to carry their identity and digital assets across platforms. Spatial.io's web-based model points toward a future where immersive environments can be as easily accessed as a regular website, while still delivering the depth and richness of three-dimensional interaction.

The development of Spatial.io illustrates the practical direction in which the metaverse is moving. It embodies the shift from abstract theory to usable technology, offering a glimpse into how immersive platforms can reshape everyday practices. Whether used for remote work, creative expression, education, or entertainment, it represents the possibility of building digital environments that are not only visually compelling but also socially meaningful. As the metaverse continues to evolve, platforms like Spatial.io will play a vital role in demonstrating the tangible benefits of immersion, accessibility, and community-driven design. They serve as laboratories for experimenting with new forms of presence and interaction, helping society gradually adapt to a future in which digital and physical realities are increasingly intertwined.

Using the Metaverse Platform Spatial.io.

Spatial.io is an immersive platform designed for collaboration, creativity, and social interaction in the metaverse. It allows users to enter three-dimensional environments where they can meet, present, learn, and explore together. One of its greatest advantages is accessibility: Spatial.io works directly through a web browser, without requiring complicated installations. This makes it easy to join a meeting or explore a virtual space simply by clicking a link. In addition to the web version, Spatial.io is available on mobile devices, allowing users to access events and shared environments from a smartphone or tablet. This flexibility ensures that participation is possible on the go and without the need for specialized equipment. For a fully immersive experience, Spatial.io can also be used with a VR headset. In this mode, the sense of presence is greatly enhanced, as users navigate spaces naturally, interact with objects, and communicate with others as if they were physically present. By offering access through the web, mobile devices, and VR headsets, Spatial.io provides a versatile tool that adapts to different needs, whether you are joining a quick meeting, hosting a workshop, or attending a virtual exhibition.

The following section of the chapter outlines the steps to get started with the Spatial.io platform.

Creating an account

A Spatial.io account gives you access to the platform's immersive features and allows you to participate fully in its virtual environments. With an account, you can create and customize your avatar, join events and meetings, and interact with others in real time. It also enables you to create your own virtual spaces, upload content such as images, videos, or 3D models, and manage invitations for participants. In short, a Spatial.io account is your personal key to entering, exploring, and shaping the metaverse within this platform.

The account is completely free, which makes it easy to get started. To create a free account, simply follow these steps:

- **Open the Website.**
  Go to https://www.spatial.io using your preferred web browser. You can also download the Spatial app for mobile devices or VR headsets, but the easiest way to start is on the website.

- **Click "Sign Up".**
  On the homepage, click the "Sign Up" button located in the top right corner.

- **Choose a Sign-Up Method.** Spatial offers several ways to create an account:
  - Use your Google account
  - Use your Apple ID
  - Use your Microsoft account

  Or create an account with your email address and password

- **Enter Your Details.** If you select the email option, type in your email address, create a secure password, and agree to the Terms of Service and Privacy Policy.

- **Verify Your Email.** Spatial will send you a confirmation email. Open your inbox, find the message, and click the verification link to activate your account.

- **Set Up Your Profile.** After verification, you can log in and set up your personal profile. You will be prompted to Create or upload your avatar (you can even generate one from a photo); Add a display name; Adjust basic settings

- **Start Exploring.** Once your account is ready, you can join public spaces, create your own virtual room, or accept invitations from others. From this point, you are free to explore Spatial.io on your computer, smartphone, or VR headset.

Customize your avatar

An avatar is your digital self in a virtual environment—a 2D or 3D character that represents you in metaverse spaces, VR/AR apps, and online worlds. Through your avatar you move, speak, gesture, and interact with others, creating a sense of presence similar to being there in person. Avatars can be realistic or stylized and are typically customizable—outfit, face, skin tone, body type, and accessories—so you can match your identity and the context (e.g., professional meetings, casual social events) while maintaining control over privacy.

To customize your avatar, follow these steps:

- **Log In to Spatial.io** Open www.spatial.io in your browser, or use the mobile/VR app. Sign in with your account.
- **Open a VR application environment (a Space)**

From the homepage, enter any Space (public or your own). Avatar editing is available inside a Space. Open the in-space user menu. Web: Look for your profile/“Me”/avatar button on the in-space toolbar (usually top/right). Mobile: Tap the in-space menu (⋯ / profile). VR headset: Open the in-space menu from your controller/wrist UI.

You can open VR application directly from link. For Rescuer app you can use directly link:

https://www.spatial.io/s/Rescuer-67e8128f81434e682273063b?share=1269784359041188244

- **Customize the look**

which allows you to choose from predefined avatars. This lets you select an avatar according to the user's preferences, including outfit, face, skin tone, and body type/silhouette. The avatar can be adapted to the context of the virtual environment.

- **Preview and apply**

Rotate the preview, make final tweaks, then click Save/Apply. Your avatar updates across all Spaces.

- **Test in the Space**

Move around, use emotes/voice to see how the avatar reads in context. You can reopen Edit Avatar anytime to refine.

Uploading content

This chapter explains how to bring your media and 3D assets into a Spatial.io space so participants can see, hear, and interact with them in real time. You'll learn the browser-based workflow for adding images, videos, documents, and 3D models, as well as how to place, scale, and organize those items inside a scene.

- **Log In to Spatial.io** Open www.spatial.io in your browser, or use the mobile/VR app. Sign in with your account.
- **Open a VR application environment (a Space)**
- **Open the Add Content menu.** Inside the space, click the "+" (Add Content) button in the space UI. In current builds it appears top-right (near your avatar). In some layouts you may also see the + on a bottom toolbar—use whichever is visible in your space.
- **Choose how you want to add content:**
    a. Drag & drop (fastest): Drag files from your desktop directly into the browser window. Items are placed in the scene immediately and also appear in your Content window.
    b. Upload from your device: Click Upload in the Add Content popup, pick your files, then place them in the scene.

- **Place and arrange your items.** Click an item to select it, then move, rotate, and scale it using the on-screen transform controls (you can also edit numeric Position/Rotation/Scale values).
- **Supported file types & size guidelines (web upload)**
    - 3D models: GLB/GLTF, FBX, OBJ (≤ 100 MB each; recommended textures ≤ 2048×2048).
    - Images: PNG, JPEG (≤ 10 MB).
    - Video: MP4, GIF, MKV, MOV, AVI, WEBM (≤ 1 GB).
    - Documents: PDF, DOCX, PPTX, XLSX (≤ 100 MB).
    - ZIP: up to 500 MB (useful for bundling models+textures).

Interacting with other participants.

Enter a space. Sign in at spatial.io and join any Space (public or one you own). You'll control an avatar and a camera, just like in a 3D game.

- **Move & look around.** Use W/A/S/D to walk; hold Shift to run. Space jumps (press twice for a double jump). Rotate the view with Q/E or the arrow keys, and use the mouse to look around. You can also toggle the avatar "face" view with V. Spatial offers three web navigation modes—Auto Rotate, Drag to Rotate, and Pointer Lock—that change how the camera behaves; pick what feels best from the in-space options.
- **Voice & video.** Speak via your microphone; on eligible plans you can also enable your webcam. Grant browser permissions if prompted (click the lock icon next to the URL). Handy shortcuts: M mutes/unmutes mic, K toggles camera. If audio/video don't work, recheck permissions in browser and in Space Settings → Audio & Video.
- **Text chat.** Use the chat panel to type messages visible to everyone in the Space; your messages briefly appear above your avatar. Hosts can toggle participant chat in Settings. Direct messages and @mentions aren't supported; links are allowed (use caution).
- **Spatial audio (hearing people near you).** With Spatial Audio Falloff enabled, nearby people sound louder and distant groups quieter—so multiple conversations can happen in one room. Hosts can turn this on/off depending on whether you want small-group mingling or one "all-hands" discussion.

- **Reactions & emotes.** Use quick reactions to communicate without interrupting: C = Clap, Y = Yes, N = No. Keys 1–5 trigger customizable emotes (e.g., Wave, Cheer). These are great for acknowledging speakers or keeping energy up during events.
- **Etiquette tips.** Mute when you're not speaking (M), move a few steps away if a nearby group is loud (that's how spatial audio works), and use reactions to signal agreement. For recordings or demos, H hides the UI, and R starts/stops recording (where supported).

Rescuer Application

The RESCUER application has been designed as an innovative educational tool using virtual reality (VR) technology to improve safety in the mountains. Its main purpose is to prepare different user groups – mountain rescuers, seniors, people with disabilities, and trip organizers – to respond appropriately in emergency situations. Through realistic mountain environment simulations, users can experience potential risks such as sudden weather changes, injuries, or health problems, all within a completely safe setting.

The application consists of two core modules. The first is informational – it provides educational materials, checklists, multimedia content, and guidelines for planning trips, preparing equipment, and offering first aid. The second module features interactive VR simulations that allow users to train in a virtual environment. Participants make real-time decisions and then receive feedback along with an educational summary.

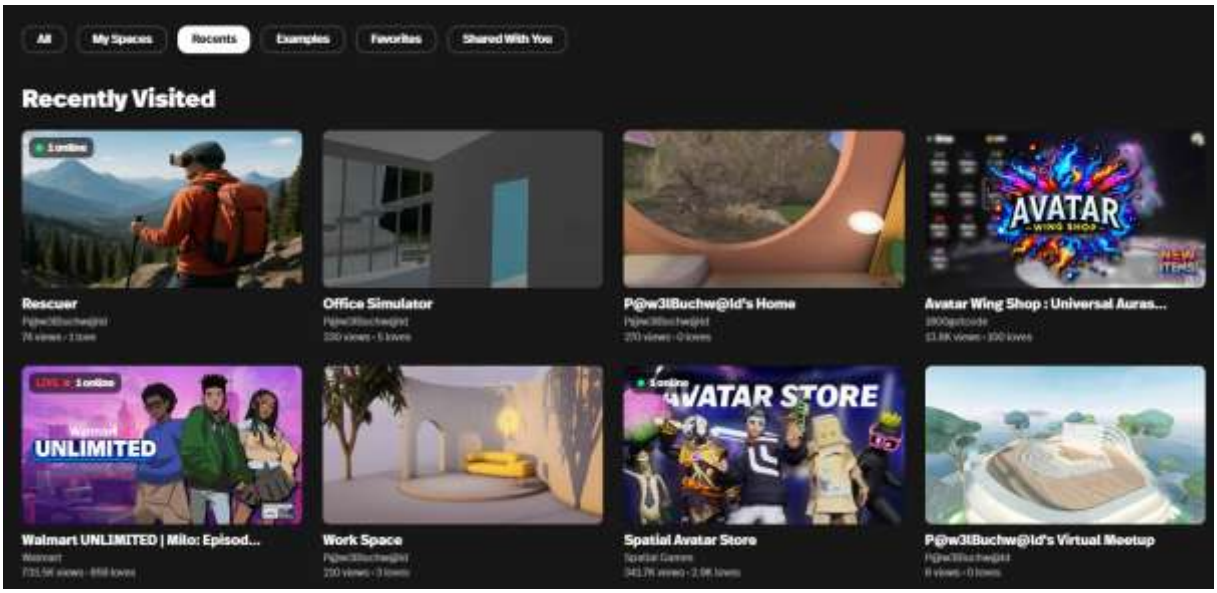
RESCUER has been developed according to accessibility standards (WCAG) to ensure usability for seniors and individuals with different limitations. It includes algorithms for improving text readability and a color validation system for people with color vision deficiencies. This ensures that the content remains clear and understandable for a wide range of users.

By combining VR and metaverse elements, the application delivers immersive and engaging scenarios that enhance learning through experience. It also enables group communication and collaboration, reflecting real-life conditions of rescue operations. RESCUER not only raises awareness of mountain hazards but also helps users prepare for responsible and safe hiking in mountain areas.

Overview of the Rescuer Application Environment

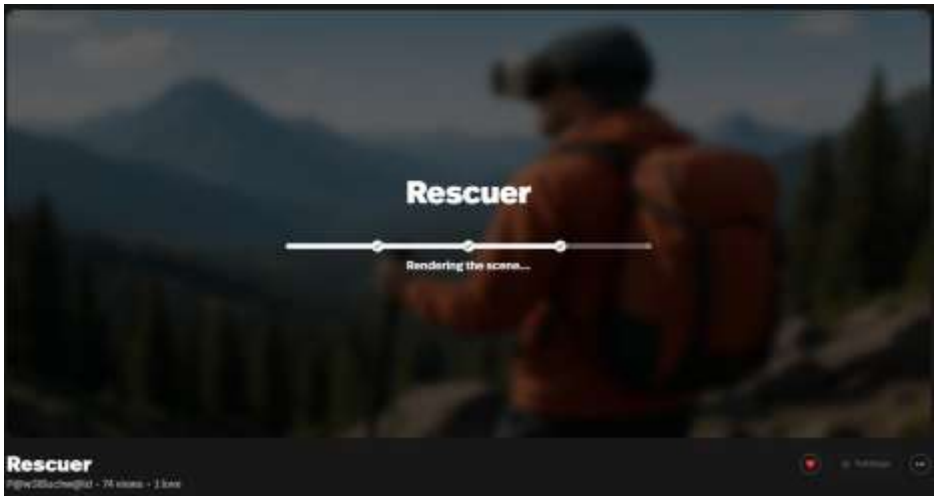
To open the Rescuer application, you need to log in to the Spatial.io platform. Then, you can search for the application in the list of shared environments by name. If the application has been used before, you can also access it through the Recent Workspaces option. The application can also be launched by using a direct link.

https://www.spatial.io/s/Rescuer-67e8128f81434e682273063b?share=1269784359041188244



Rysunek 1. Selecting the RESCUER Application on the Spatial.io Platform

After selecting the environment, the application launch window will appear. Starting the Rescuer application may take a few minutes depending on the quality of the internet connection.



Rysunek 2. Launching the RESCUER Application.

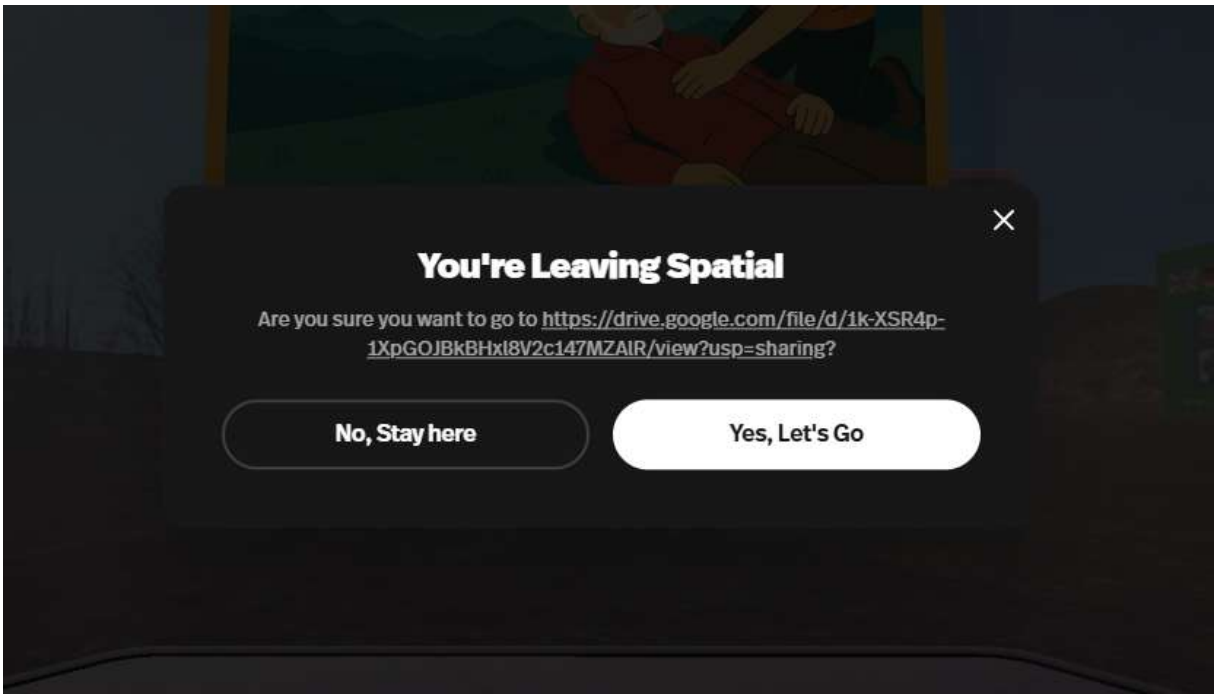
After launching the application, you can navigate the virtual reality environment using the WASD keys or the arrow keys. Controlling the avatar is similar to moving in 3D computer games. You can also use the mouse for navigation. The mouse scroll wheel allows you to adjust the zoom level of the view. Upon starting, the user is placed in a part of the scene where virtual rooms are located, containing links to educational materials and interesting facts related to mountain tourism safety.

Rysunek 3. RESCUER Application Scene After Launch.

After entering a virtual room, you can explore the educational materials. Each of them is provided as an external resource hosted on separate platforms. To open an external resource in the Spatial.io environment, you need to use a portal object. These are blue circular objects that allow interaction. Their function is equivalent to hyperlinks on websites – clicking on one redirects the user to the target platform. The ability to view the linked content depends on whether the client computer has the appropriate software installed to handle the target file. In the RESCUER application environment, most hyperlinks lead to PDF files or websites, which can be accessed using a standard web browser (e.g., Google Chrome, Microsoft Edge)..

Rysunek 4. Link to External Resources.

When you click on an interactive hyperlink object, an information window will appear notifying you that the user needs to be redirected to an external portal. To view the resource on the external server, you must accept the redirection.



Rysunek 5. Redirect window.

Scenarios in the RESCUER Application

The application provides four scenarios, designed as tasks that reflect real-life problems and challenges that may occur during a mountain trip. The topics of the scenarios are divided into the following areas:

- Scenario 1. Mountain trips with the participation of seniors
- Scenario 2. Mountain trips for people with disabilities
- Scenario 3. Issues related to the proper organization and course of the trip
- Scenario 4. Trail hazards, safety, and first aid

Each scenario is available in five languages (English, German, Czech, Slovak, and Polish).

To select a scenario, the user must locate the main control panel in the virtual environment, as shown in the figure below..

Rysunek 6. Scenario Selection Panel

Language selection is possible through an interactive flag object. After clicking on the appropriate flag, information will appear about the chosen language in which the scenario will be conducted.

The selection of one of the scenarios is done by interacting with the buttons in the central part of the screen. After clicking, a text message appears describing the selected scenario.

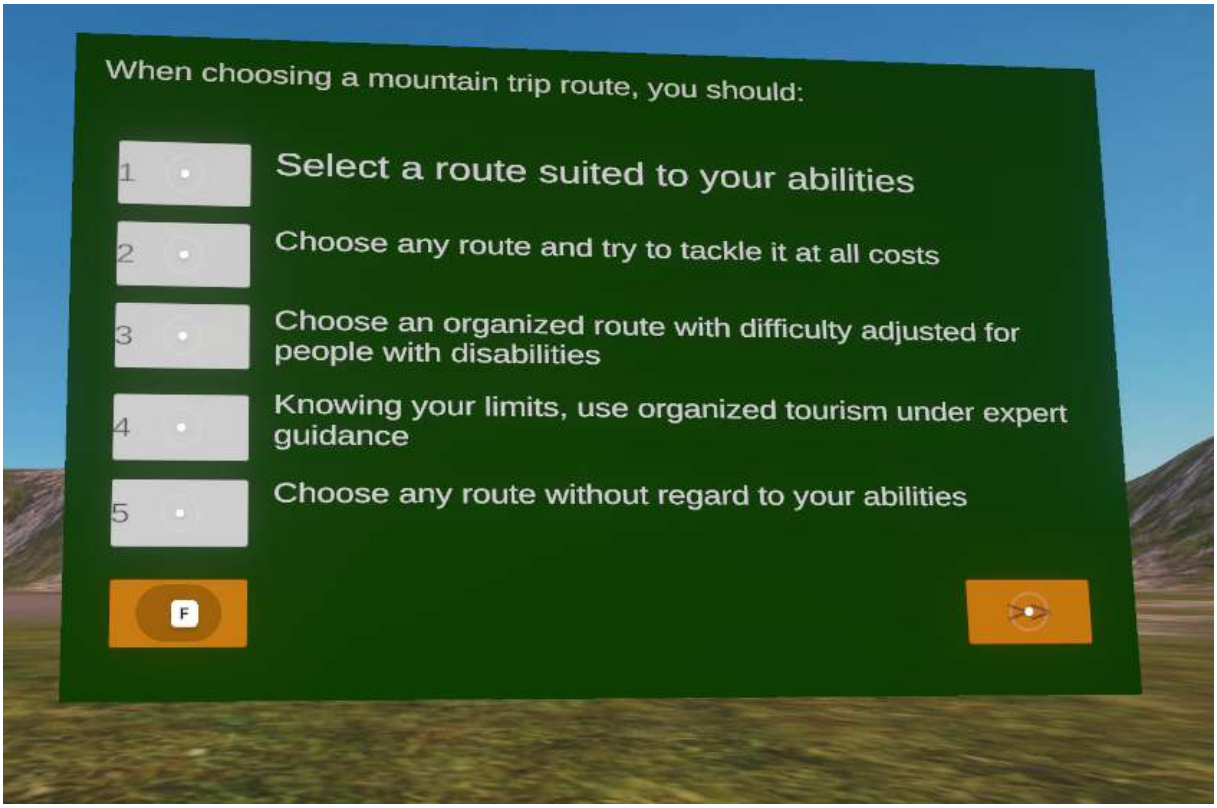
Clicking the Start button in the lower-right corner begins the scenario. Once the scenario is launched in the RESCUER virtual environment, the user must locate the special green tree object, where the task will be displayed.

Rysunek 7. Start of the Scenario.

Each task consists of selecting the appropriate decision for the given problem. The user makes their choice through a panel displaying the possible answers. By using the interactive buttons on the left side of the panel, the user marks the correct answers (more than one correct option may be possible in the scenario tasks).

A button on the left side of the panel allows users to check the correct answers. Once the correct answers are identified, the user can proceed to the next task in the scenario by clicking the “Next” button on the right side of the interactive panel.

The appearance of the panel with interactive buttons, which enable participants to select the correct answers, preview them, and move on to the next task, is shown in the figure below.



Rysunek 8. Task inside Scenario.

After completing all the tasks in a scenario, it is possible to proceed to the next one. Thanks to the nature of the Spatial.io metaverse environment, the user can complete tasks individually, while at the same time being guided by other participants present in the virtual reality of the application.

The ability to iteratively repeat scenarios multiple times and review the educational resources available on the platform allows users to continually improve their knowledge of safety during mountain trips.