AR Troubleshooting Scenarios Instructor Guide

Overview

This instructor guide is designed to help you set up and facilitate physical network troubleshooting scenarios using augmented reality (AR). The scenarios are intended to build observation skills, reinforce physical inspection techniques, and provide a scaffolded experience for students to identify and document network-related hardware issues.

The following paragraphs will cover how to get started, what students will experience, classroom setup tips, sample troubleshooting scenarios, and guiding questions for further discussion.

Getting Started

This section includes a checklist of what you'll need, how to set up camera access, the AR markers, and suggested marker placements.

Checklist

To get started, you'll need:

- ☐ Access to the AR troubleshooting app
- ☐ 4 printed AR markers (see AR Markers section)
- ☐ Basic networking equipment or simulated setups with physical alterations
- ☐ A mobile device or smart glasses with AR capabilities for each student

Allowing Initial Camera Access

If it's your first time accessing the app, you will be prompted to use your camera. There are two prompts to be aware of: camera access and system access. Note that these settings only need to be configured once.

Allow Camera Access

To enable camera access, tap **Allow While Visiting the Site**. Figure 1 shows an example of a camera access prompt.

Allow System Access

To enable system access to the camera, tap **Allow** to grant system access. Figure 2 shows an example of a system access prompt.

Blocked Camera

If you accidentally block camera access, you can re-enable it from your device or browser settings. Alternatively, clearing your browser’s cache may also reset the permission prompt.

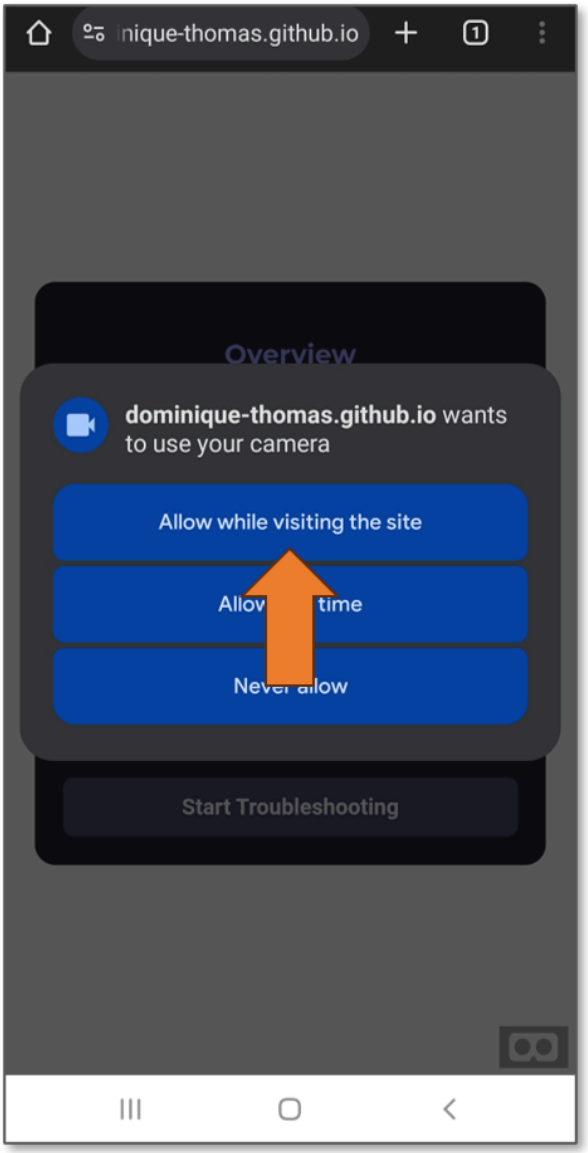


Figure 1 - Camera Access Prompt Example

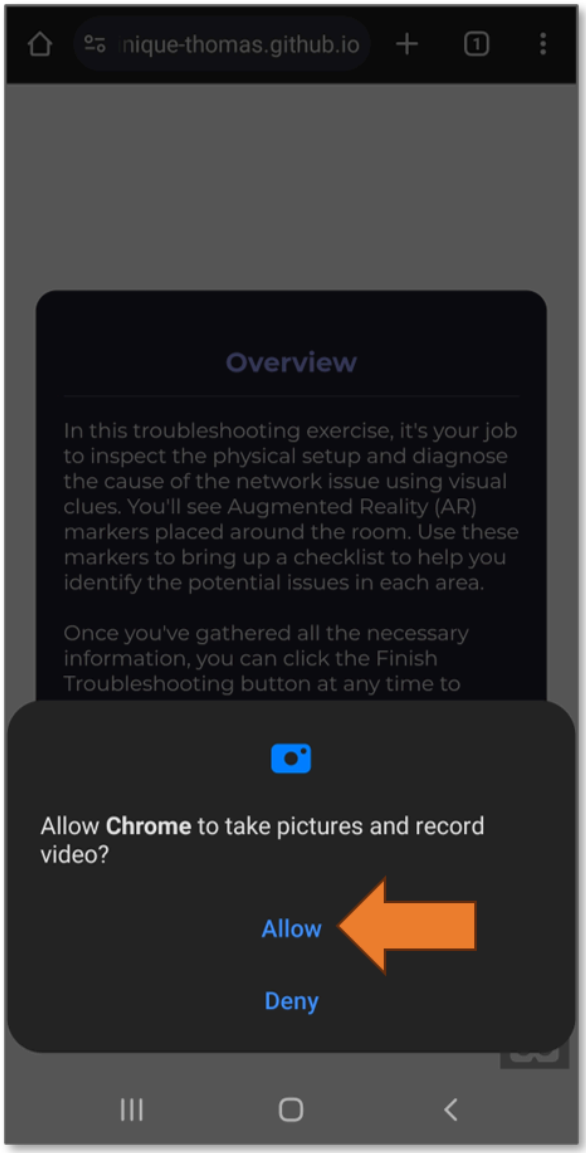
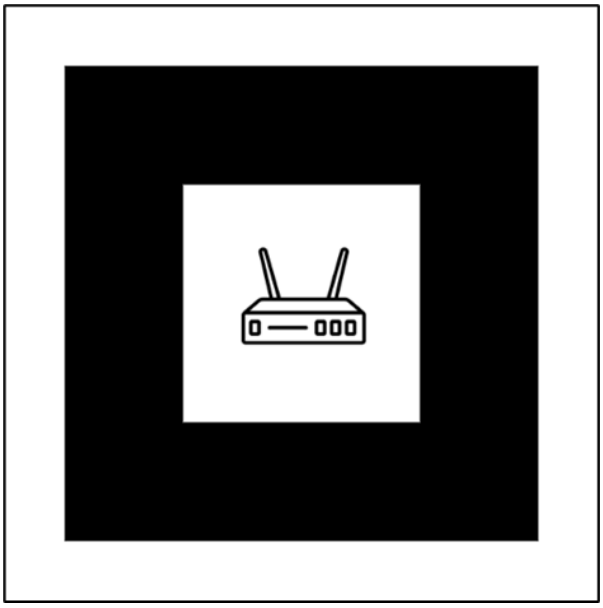


Figure 2 - System Access Prompt Example

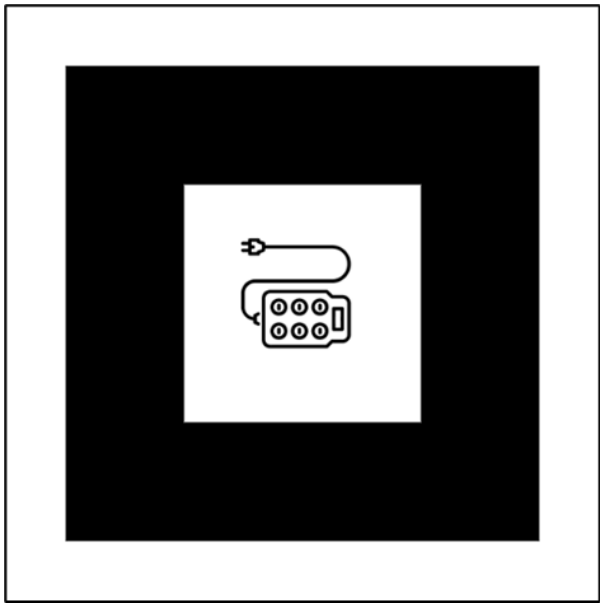
AR Markers

The AR markers in this scenario target common physical network components such as **network** devices (e.g., modem, router, or switch), **power** sources (e.g., power strips, wall outlets), network **cables** (e.g., ethernet, coaxial, etc.), and end-user **devices** (e.g., PC, laptop, and tablets).

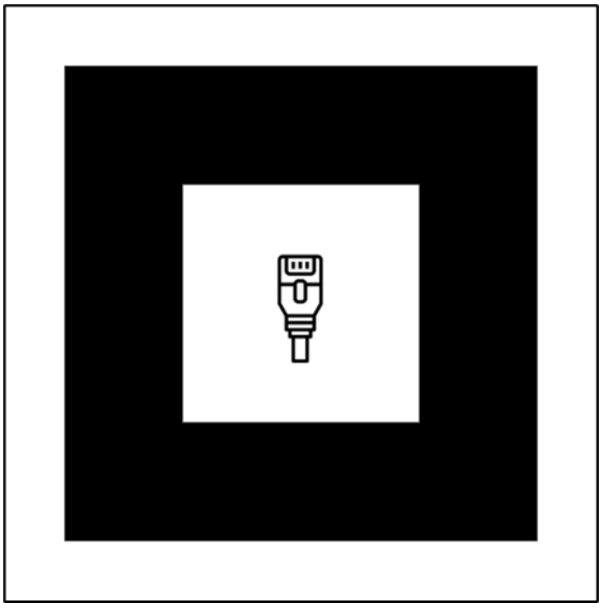
The following page displays the AR markers you'll need for the troubleshooting scenarios. To view them in the app, you can print the page and cut out the black-and-white markers themselves—no need to include any surrounding text. The markers are framed by a bold black border to help with visibility and tracking. Alternatively, you can display the markers on another device, such as a PC, phone, or tablet.



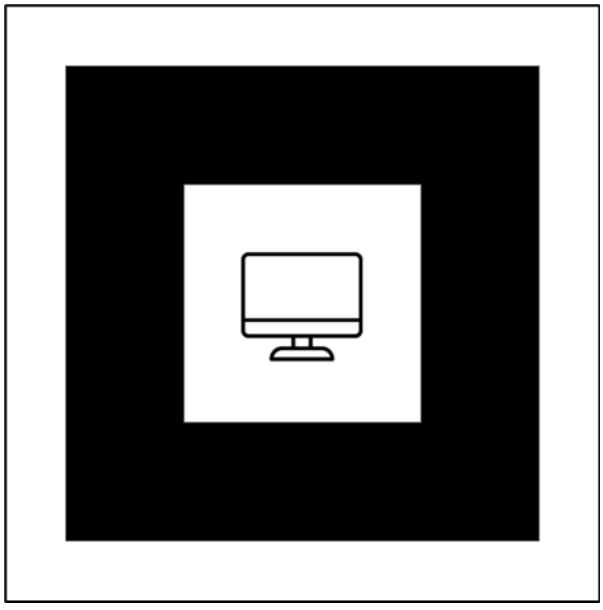
Network



Power



Cable



Device

Recommended Marker Placement

To ensure accurate tracking and smooth interaction, it’s important to place AR markers in easily visible and relevant areas to the specific hardware components being inspected. Below are guidelines for marker placement.

Network:
Place the marker on or near network devices like routers, modems, or switches. Place the marker in a location where users can easily check for power, connectivity, or cable placement without obstruction. Figure 3 shows an example placement for the Network marker.

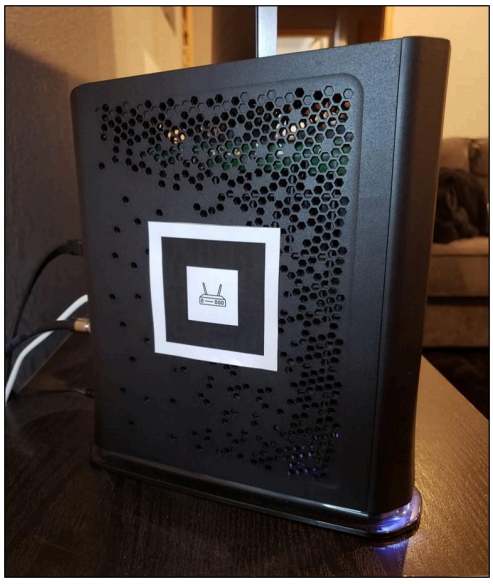


Figure 3 - Power Marker Placement Example

Power:
Place the marker near power strips or wall outlets to check for proper connection and power flow. Ensure the marker is positioned on a stable surface, such as the power strip's body or near the outlet, where it's easy to access and view. Figure 4 shows an example placement for the Power marker.

Figure 4 - Power Marker Placement Example

Cable:
Place the marker near cable connection points, where cables plug into devices or wall outlets. This will help users quickly inspect for proper connections, potential damage, or disconnections. Figure 5 shows an example placement for the Cable marker.

Figure 5 - Cable Marker Placement Example

Device:
For devices like PCs, laptops, or tablets, place markers on the front or side of the device where users typically interact. Ensure that the marker is visible and doesn't obstruct any ports or important areas that need to be inspected. Figure 6 shows an example placement for the Device marker.

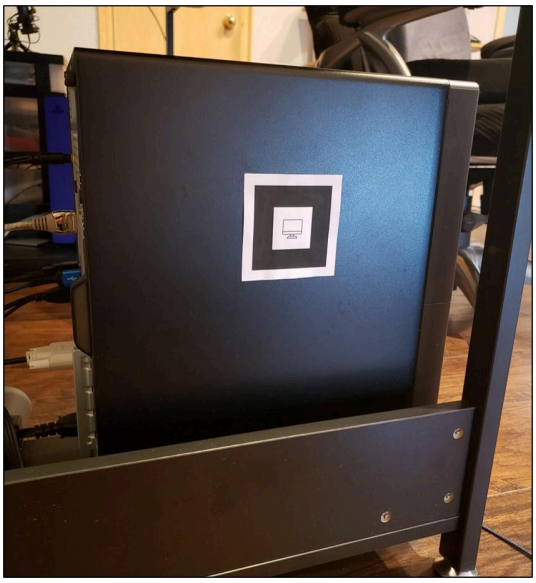


Figure 6 - Device Marker Placement Example

How the App Works (Student View)

This section outlines what actions need to be performed by the students when interacting with the app. While the app is designed to be intuitive, it's helpful for you to be familiar with the experience if students have questions about how to use it. For all troubleshooting scenarios, students must perform the following tasks:

1. Access the AR app link on an AR-supported device
2. Use their camera to scan each of the 4 image markers placed around the environment
3. Visually inspect the physical equipment at each marker location
4. Use the in-app checklist and notes section to document any observations or issues
5. Click the **Finish** button in the app to review their notes and present findings

Troubleshooting Scenario Samples

Each scenario should include one or more intentional issues that you introduce for students to identify. Below are some sample physical network modifications you can make. Note that the following sample scenarios are organized based on learners' skill level.

Sample Scenario A – Beginner

- The cable is not securely connected
- The cable is unplugged
- The power strip is off
- The device is powered off

Sample Scenario B – Intermediate

- The cable is plugged into the wrong port
- There is a loose power connection on the device
- The device is not receiving a signal from the router
- The cable has signs of physical wear

Sample Scenario C – Advanced

Combine subtle issues:

- Cables are connected, but in the wrong order
- The device is placed too far from the router
- Port lights show no activity
- Interference is causing signal issues

Tips for Customizing Your Classroom

The following tips can help you create your classroom scenarios:

- To keep the experience fresh, rotate physical changes between different student groups
- Scenarios can be run either individually or with multiple students
- You can adjust the difficulty of the scenarios by varying the complexity or subtlety of the issue(s)
- Encourage peer discussion or shadowing to promote collaborative learning
- Follow up with a debriefing session or ask students to explain how they verified the issue

Guiding Questions for Further Discussion

The following questions can be used for peer discussions or instructor feedback, depending on your preference. They're designed to encourage reflection and provide deeper insight into the student's troubleshooting process.

1. What steps did you take to identify the issue?
2. Can you walk through your troubleshooting process?
3. How did the AR markers help you narrow down the problem area(s)?
4. What would you do differently if you encountered the same issue again?
5. What challenges did you face while troubleshooting, and how did you overcome them?