

CSE Senior Design

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In partnership with the **U.S. Army Corps of Engineers (USACE)**

Abstract

This project is **sponsored** by the **U.S. Army Corps of Engineers (USACE)** in partnership with **UTA** and is intended to be used in outreach and educational settings. The purpose of the Interactive AR Table is to provide an immersive and accessible way to educate the public about the environmental consequences of human activity, especially in relation to water pollution and civil infrastructure.

Problem & Solution

Problem:

- Initial tabletop design was bulky and hard to transport
- Not suitable for quick repeatable demonstrations
- Required manual resetting and cleanup after each use

Solution:

- New AR Table is compact and portable
- Uses AR to project 3D models and animations onto the surface
- Provides guided narration and timed visual sequences
- Eliminates manual resets and streamlines demonstrations

Team Contributions

1. **Adrian Macias** - Developed App screens and functionality, Construction site scene, on-scene narration.
2. **Nooraldeen Alsmady** - Designed and animated the factory scene; enhanced visuals and overall AR experience.
3. **Yahia Khaled Elsaad** - Designed neighborhood scene and assisted with animations.
4. **Mohamad Nabih Alkhateeb** - Partnered on neighborhood scene and animation features.
5. **Mauricio Mendoza-Silos** - Built project structure, tabletop terrain design and implementation, water animations; handled communication.


The Original Concept



The AR Reality



How it works

1. By using your mobile device's camera, the app can detect the AR marker which will spawn in the scene over the table.
2. Once the scene has appeared, you are able to walk around and get close in on the scene
3. Facing the speaker button with the symbol direction like this:  You can tap the speaker button to play the narration for that part of the scene to explain the water pollution effects. Tapping the button again before finishing will stop it.

Scan here to download the app:
(Android Only)



How to Download and setup App

1. With any modern Android device, scan the QR code above using the phone's camera or QR code reader and click the link that pops up to navigate to the GitHub webpage.
2. From there you can click the link on the site and download the "AR_Wetlands.apk" file and open it up once finished downloading.
3. Then with the app open, click "Begin Experience", this will prompt camera access to be able to view the AR scene, click "allow" and you should see the camera feed.
4. Then approach the tabletop and scan the printed AR marker in the center of the table from top down and slowly going out of it.
5. The scene will appear, and you can begin exploring!

Troubleshooting

Scene Misalignment or Duplicate Scene

If the scene appears to be misaligned or appear to have a duplicate one right over it, close the app completely, reopen the app, scan the AR marker at a slight angle almost over and close to it and slowly back away from the marker to allow the scene to spawn into view. Try again if the issue persists.

This issue is due to unforeseen limitations with the Unity AR mobile platform it's running on.