Stamatia Papazis and Anthony Scarlatos
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Virtual Try On: A Web-Based Interface for Enhancing Cultural Spaces with Augmented Reality

1. Introduction

Historically, museums and other cultural spaces have been associated with the observation of exhibits, not interaction with exhibits. Our application, Virtual Try On, aims to transform this experience by enabling visitors to engage with exhibits that feature clothing.

While similar initiatives have been introduced in recent years, many rely on on-site augmented reality mirrors or require users to download mobile applications on their devices. In contrast, Virtual Try On is entirely web-based. This means users can access the virtual try on experience from any device and from any location, making the cultural content more accessible to a wider, more diverse audience. Our research is focused on showcasing garments designed by students at the Fashion Institute of Technology (FIT).

2. The Virtual Try On Application

2.1. Obtaining the three dimensional garments

The three dimensional garments showcased in our application were designed and created by Professor Jennifer Lee and her fashion business management students at the Fashion Institute of Technology. They were created in CLO, a 3D fashion design software program, and provided to us in FBX format.

2.2. Creating the virtual try on lenses

The next step in the development process was to integrate the 3D garments provided by FIT into a platform that could provide an interactive, augmented reality experience. We chose Snap AR Lens Studio, a powerful tool for creating AR experiences that supports full body skeletal tracking. We imported each garment's FBX into Lens Studio where we built a lens for each. These lenses enable users to superimpose the garments onto their own bodies, providing the augmented reality experience of trying them on virtually.

2.3. Using Lens Studio's Developer Portal

Once all of the lenses were created, we published them to Snapchat from Lens Studio. Inside the Snap Developer Portal, we created a Lens Group with a unique ID for each garment type, each containing three different colored lenses corresponding to unique indices to reference in the code.

```
    document.getElementById('RedTShirt').addEventListener('click', () => {
        session.applyLens(lenses[0]);
        currentLens = 0;
    });

    document.getElementById('GreyTShirt').addEventListener('click', () => {
        session.applyLens(lenses[1]);
        currentLens = 1;
    });

    document.getElementById('WhiteTShirt').addEventListener('click', () => {
        session.applyLens(lenses[2]);
        currentLens = 2;
    });
}
```

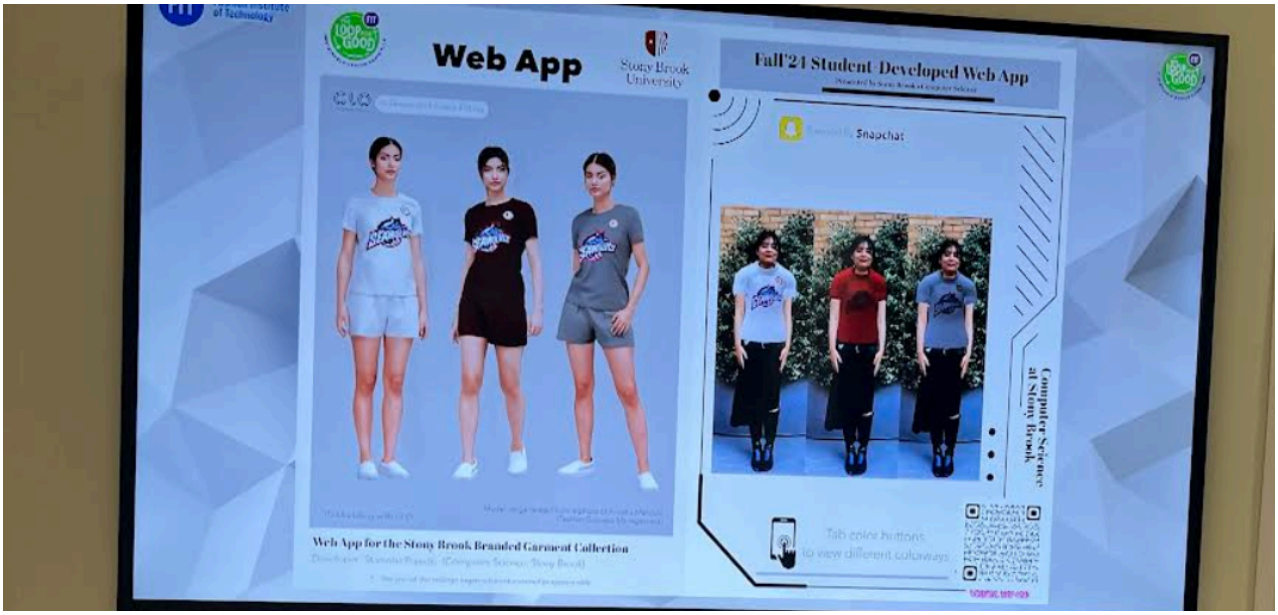
2.4. Incorporating the Camera Kit SDK and MediaStream API

In the Snap Developer Portal, we also obtained an API token in order to utilize Camera Kit, Snap's cross-platform SDK. Together with the MediaStream API, we successfully built the augmented reality technology into our web application.

```
var cameraKit = await bootstrapCameraKit({ apiToken });

const session = await cameraKit.createSession();

document.getElementById('canvas').replaceWith(session.output.live);

const { lenses } = await cameraKit.lensRepository.loadLensGroups([lensGroupID]);
session.applyLens(lenses[0]);

const startCamera = async (facingMode, cameraType) => {
    let mediaStream = await navigator.mediaDevices.getUserMedia({
        video: { facingMode: facingMode }
    });
    const source = createMediaStreamSource(mediaStream, {
        cameraType: cameraType
    });
    await session.setSource(source);
    session.source.setRenderSize(500, 800);
    session.play();
};
```

2.5. Enhancing the user interface

In order to further improve the accessibility and usability of Virtual Try On, we added options for both the front and back cameras on the user interface. This design allows users on mobile devices with multiple cameras to select their preferred camera. For the exhibition at FIT, the back camera option was used to capture photos for modeling purposes, while the front camera allowed users to access the Virtual Try On independently.



3. Future Work

Though our work was applied to FIT's Loop for Good exhibition, Virtual Try On was designed with scalability in mind. Possibilities for future work include incorporating 3D models of clothing exhibits from other cultural spaces. In addition, future work could involve development of a portal through which cultural space managers can create virtual try on exhibits tailored to their cultural spaces themselves on our web application.

4. Conclusion

Virtual Try On successfully provides users the experience of trying on clothing virtually, all from within the browser. It seamlessly incorporates multiple technologies: Lens Studio, Camera Kit, and Mediastream. In the future, Virtual Try On has the potential to be scaled to other exhibits, increasing engagement with and accessibility to cultural spaces.