Problem

- Customers can not try a pair of shoes on before ordering online.
- As a result, the shoe might be too large, too small, or not suitable with other outfits.
- Existing solutions:
  - Only project 2D images.
  - Do not have foot tracking.
Our Solution

• Develop an Android application that allow users to try a pair of shoes virtually using their phone’s camera, by
  ● Tracking user’s foot and create an augmented reality marker.
  ● Rendering 3D shoe models on the marker.
  ● Positioning and orienting 3D shoe models relative to the marker.
Implementation

- SQLite database of shoes’ information and images. For images the database stores URL to the image files.
- The app consists on three screens:
  - Screen 1: List of shoes from database + Search bar.
  - Screen 2: Basic information of shoes + ‘Check it out’ button.
  - Screen 3: Users can capture target image and view the rendered 3D shoes on the target image from the phone’s camera screen.
Implementation (cont.)

**Screen 1:**
- Displays a list of shoes in ListView using ShoesAdapter:
  - Gets available shoes from database.
  - Implements Filterable for search functionality based on the user’s input keywords on the Search bar.
- When users select an item, navigate to screen 2.
Implementation (cont.)

- **Screen 2:**
  - Display the selected shoes’ information and images stored-in database.
  - Use third party library Picasso to download and display images.
  - ‘Check It Out’ button that navigate to screen 3 when clicked.
Implementation (cont.)

Screen 3:

- Create a camera layout that positions a 3D shoe model on the image target.

- Initially, we searched for a 3D shoe model in .obj format and converted it into arrays using the open-source script obj2opengl.

- These arrays are parsed to the renderer using Teapot.java class. The texture image is imported to resource folder.

Football 3 Colors by f3c is licensed under CC Attribution
https://skfb.ly/HOtT
Implementation (cont.)

Screen 3:

- When users click on the camera button, the current frame will be captured and become target for rendering.

- The renderer retrieves model data and loads texture image from resource folder. These data are translated, scaled and rotated according to the position and size of the image target.

- Finally, the 3D shoe models will be drawn on screen.
Result
Future Consideration

● Reorganize our code and implement multi-tasking to optimize model loading time.
● Foot Tracking: be able to detect low-detailed target
● Add a new functionality that allow users to select shoes size and colors.
● Construct our own 3D shoe models for higher quality.
● Design a database dedicated to shoe models instead of storing them in resource folder.
● Construct an account system where users can create account, and store their information, as well as past shoes selection.
References

• https://sketchfab.com/models/991c204df0734daf8da4f4f9ef74825#
• https://developer.vuforia.com
Thank you for listening