

Ubiquitous and Mobile Computing

CS 4518: Final Project

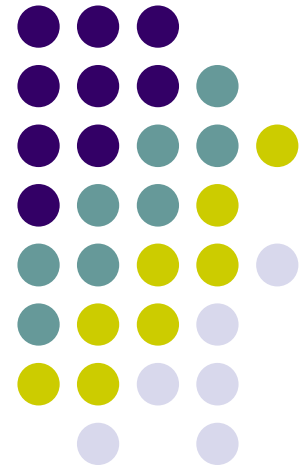
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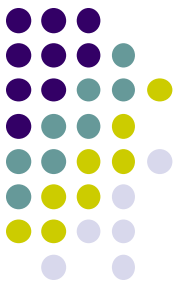


Problem



- 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.

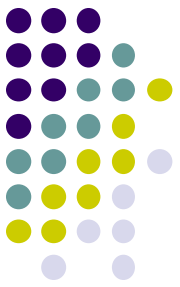




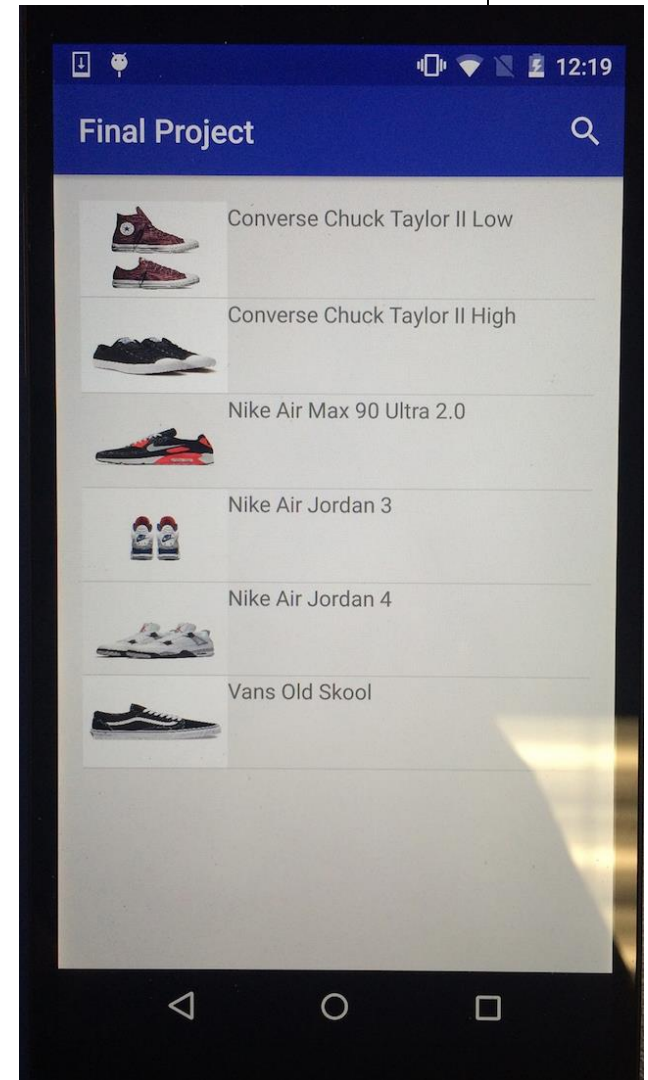
Implementation

- 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.)



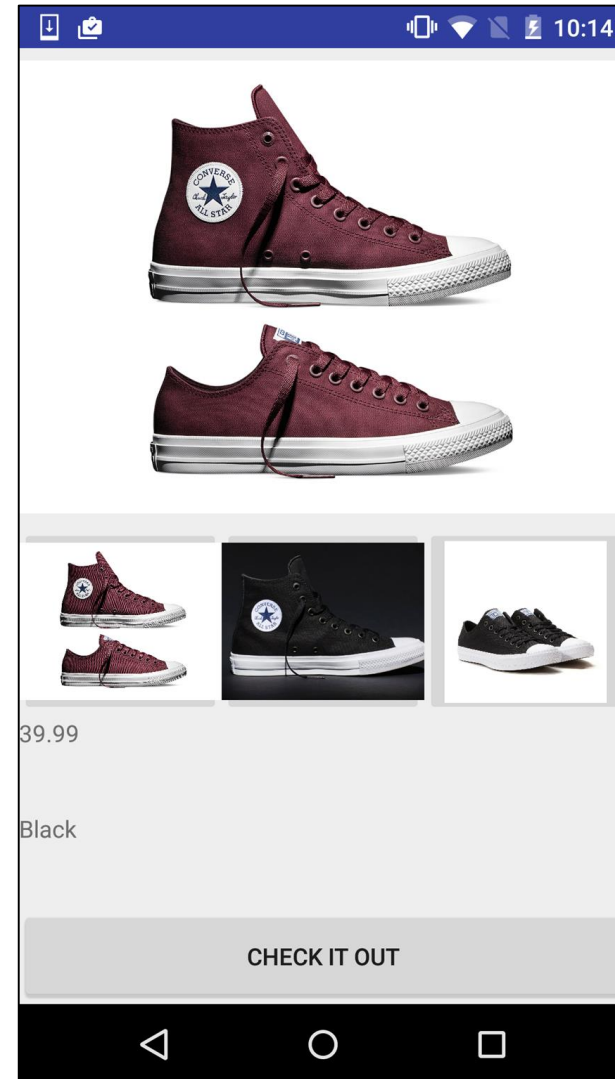
- Screen 1:
 - Displays a list of shoes in ListView using ShoesAdapter:
 - Gets available shoes from database.
 - Implements Filterable for search functionality based on the user's input keywords on the Search bar.
 - When users select an item, navigate to screen 2.

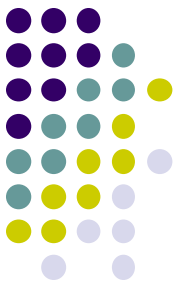




Implementation (cont.)

- Screen 2:
 - Display the selected shoes's 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.



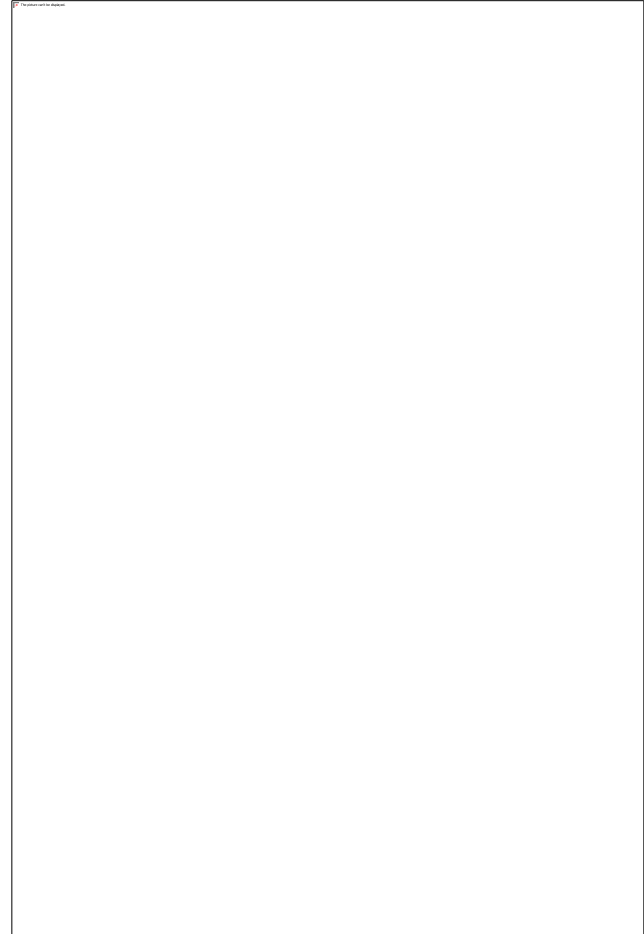
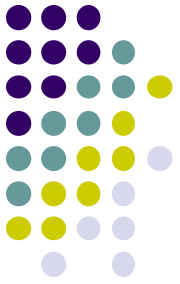
Football 3 Colors by **f3c** is licensed under CC Attribution
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Implementation (cont.)

- 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

- <http://www.freshnessmag.com/2010/12/07/the-sampler-by-converse-augmented-reality-iphone-app/>
- <https://sketchfab.com/models/991c204df0734daf8da4f4f9ebf74825#>
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Thank you for listening