A Disappearing A-Pillar

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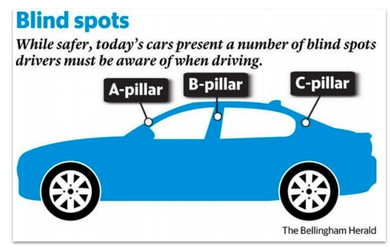
Introduction

The A pillars in many cars block or limit the driver's view, causing dangers and accidents.

This project aims to explore the feasibility of making the A pillar "virtually transparent" through the use of the camera, display, and computation capabilities of widely available, inexpensive tablets.



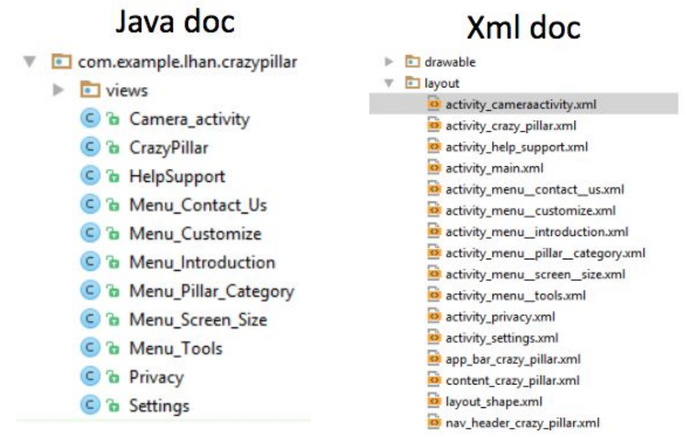
Design Requirements

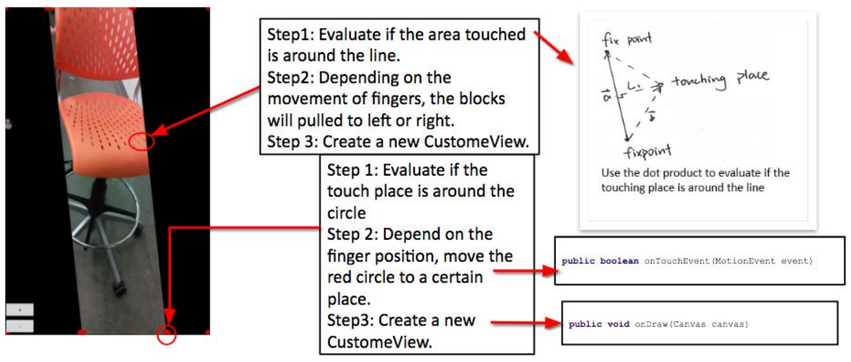
Functional Requirements:
- Tablet (hardware): Nexus 7
- App development (software):
  - Camera activity: Zoom in/out, block size change.
  - Customization: Input the default size of the pillar.
  - The size of the tablet is supposed to be suitable for the width of the A pillar.
  - App can work at the speed below 10 miles

Non-Functional Requirements:
- About - Project statement, purpose, and design
- Contact us - Our introduction and contact information
- tablet is securely fixed onto the pillar

Operating Environment
- Tablet will be affixed to the A-pillar inside the car, so it doesn't need to be waterproof.

Technical Details





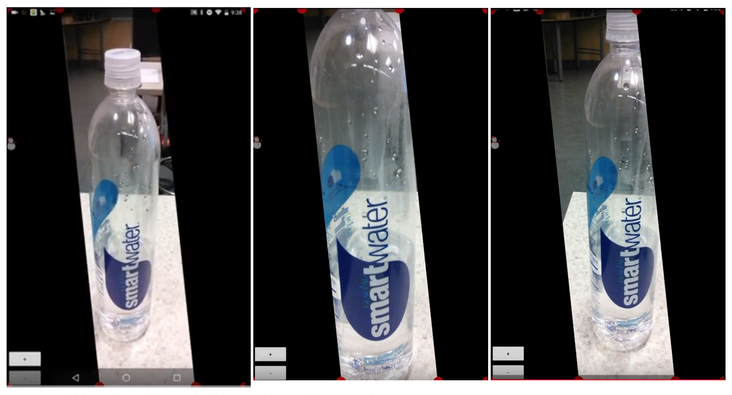
Technology platform

- Android studio 2.3.3
- Android 6.0 Marshmallow
- Nexus 7.0

Testing Results

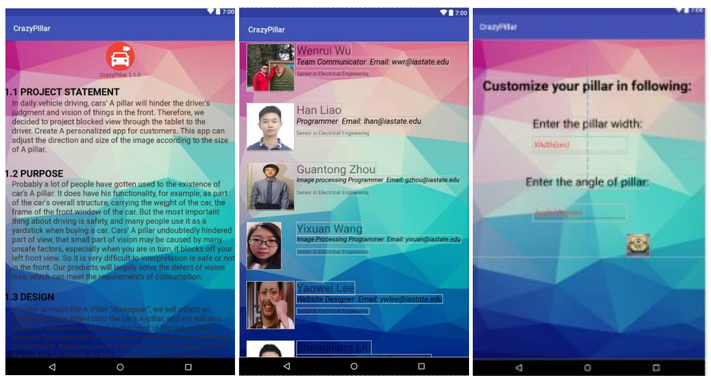
Application Functions Testing

- **Zoom in/out Function**



- **Block size Adjusting Function**

- **About / Contact us / Setting pages**



Testing in real condition

Step 1: Test car(Ford Edge)

Step 2: Mount used to hold tablet in place is affixed onto the windscreen

Step 3: Tablet is attached onto The A-pillar.

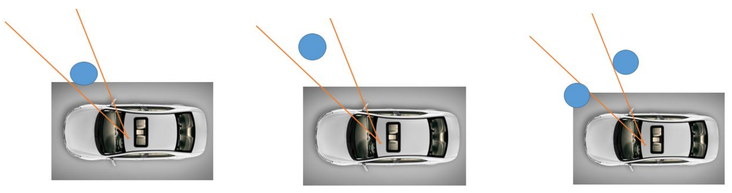
Step 4: A video is recorded while the vehicle is moving from the driver's view.

Data Collection

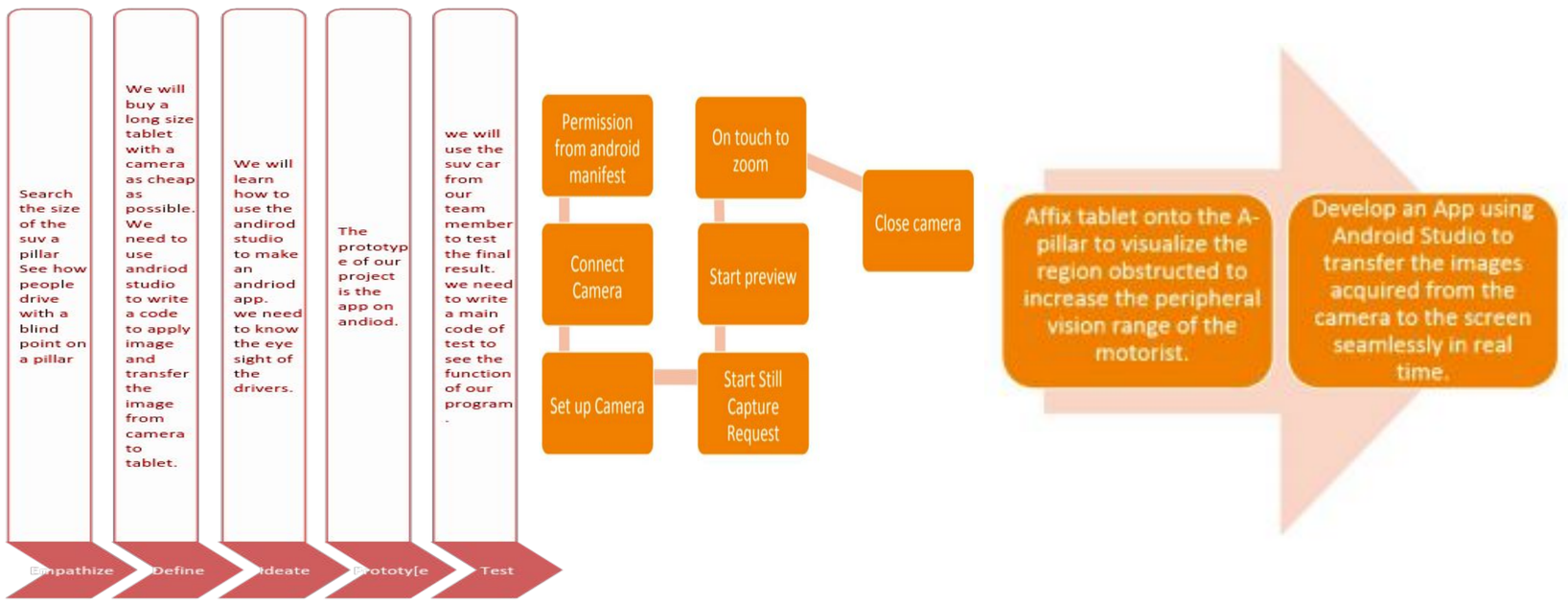
Distance: 1.2m
Up boundary 1.275m
Bottom boundary 1.02m

Distance: 4.2m
Up boundary 1.5m
Bottom boundary 0.17m

Visual Angle
Left: 70 degree
Right: 30 degree



Design Approach



Intended Users / Intended Use

Our target user base for this project are motorists whose vehicles have wide A-pillars, due to the fact that vehicles with wider A-pillars will obstruct more of the driver's' field of vision. This blind spot will be further exacerbated and ameliorated depending on the size of the A-pillar which differs from vehicle to vehicle. For our project however, it is assumed that the user base mainly drive Sports Utility Vehicles (SUVs) since these cars generally have wider A-pillars.

The motorists can attach the tablet onto the A pillars of their vehicles. The region outside the vehicle obstructed by the A pillar will be displayed on the screens of the tablets, giving the illusion of it being transparent. The section of the camera screen displayed will be parallelogram shaped, mirroring the shape of the A pillar.

Engineering Constraints & IEEE Standards

In terms of the constraints of our project, because the image quality of our tablet and the setup issue with model car, our project could not totally make car pillar transparent. And because of the aim of this project is to provide an affordable method to increase the viewability of driver, we may not choose to use some high quality equipments, like go-pro camera. The image that we provide might not be that clear. But as time goes by and when we learn more, we hope to solve the setup issue with model car and make it as close to transparent as possible.

IEEE Standard on Video Techniques for measuring the resolution of camera systems are described

IEEE standard for Social Responsibility Assessment of Computers and Displays

Works Cited

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