



e-ISSN: 2319-8753 | p-ISSN: 2320-6710

# IJRSET

International Journal of Innovative Research in  
**SCIENCE | ENGINEERING | TECHNOLOGY**

# INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

**Volume 9, Issue 9, September 2020**

**ISSN** INTERNATIONAL  
STANDARD  
SERIAL  
NUMBER  
INDIA

**Impact Factor: 7.512**

9940 572 462

6381 907 438

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# Novel Approach for Virtual Dressing Room using Augmented Reality

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**ABSTRACT:** A Virtual Trial Room application utilizing Augmented Reality which enables a client to attempt on virtual garments. The client posture and profundity is followed utilizing the web camera and virtual garments are lined up with the followed client. The garments moves and creases practically and the lighting force of the material render is adjusted to coordinate surrounding lighting conditions. The exhibited application enhances related increased reality application by including full client posture following and by utilizing 3D dress models joined with fabric recreation rather than 2D pictures.

**KEYWORDS:** Augmented reality, camera, 3D clothes

## I. INTRODUCTION

In today's world, we all enjoy an easy access to a huge variety of apparels through online shopping websites, possessing attractive price range, prompt customer support, and free home delivery. Although there is one minor issue that could make people lose interest in online shopping, it might not be possible to try-on clothes in such cases. Our motive here is to increase time efficiency and improve the accessibility of the try-on option for clothes by creating a virtual dressing room environment. Looking for garments is a typical day by day movement both in-store and on the online sites. An in-store customer more often tries on some chose garments and inspects how well they fit. While an online customer more often than not checks how well the garments fit the models in the on the online pictures. Firstly, in a physical store, with a specific end goal to try on some selected clothes is a typical practice is to line up and alternate to utilize the changing rooms. Because of the set number of in-store changing rooms, customers usually have to spend most of their shopping time on lining up. To close what have been observed, both in-store and internet shopping have unavoidable constraints which offer ascent to clients' unsatisfied shopping encounters and in addition the retailers' misfortunes of potential sells. A thought called "Virtual Try On" is put forward. Clients would have perceive to see the visual picture of how they look like by attempting on garments basically, with the goal that they can effectively sift through a few choices without alternating to utilize the fitting rooms.

## II. REVIEW OF LITERATURE

1. "A R DressCode: Augmented Dressing Room with Tag-based Motion Tracking and Real-Time Clothes Simulation Author: Krista Kjærside, Kaj Gronbrek, Karen Johanne Kortbek and Henrik Hedegaard." This paper introduces a new augmented reality concept for dressing rooms enabling a customer to combine a tactile experience of the fabrics with easy simulated try-on. The dressing room has a camera and a projection surface instead of a mirror. The customers stick a few visual tags to their normal clothes. Then the ARDressCode application features motion capture and provides an AR video stream on the AR "mirror" with the selected piece of clothes mixed in and fitted to the customer body. Design issues and technical implementation as well as the prospects of further development of the techniques are discussed.
2. "Virtual Makeover and Virtual Trial Dressing Author: Jaychand Upadhyay, Divya Shukla, Nidhi Patel, Sheetal Nangare."

Now-a-days everyone wants to look fashionable. But, it is difficult for ordinary users to make a wonderful makeup and hairstyles. Moreover, when you are in nude look and want to share better look with your friends, the fastest and easiest way is virtual makeup. However, current existing makeup software needs many user inputs to adjust face landmarks, which influence the user experience. And, it cannot remove the flaws on skin as good as the real cosmetic makeup. Hence, we have introduced such system that allows you to do almost all the makeup work. The system would be platform independent and made up of all the free-source development tools so that if taken commercially later we will keep the cost as low as possible. This will make it accessible in small time running beauty parlors.

3. “VIRTUAL TRIAL ROOM USING AUGMENTED REALITY Author: Shreya Kamani, Neel Vasa, Kriti Srivastava”  
This paper presents a Virtual Trial Room application using Augmented Reality which allows a user to try on virtual clothes. The user pose and depth is tracked using the Microsoft Kinect sensor and virtual clothes are aligned with the tracked user. The clothing moves and folds realistically and the lighting intensity of the cloth render is adapted to match ambient lighting conditions. The presented application improves on related augmented reality application by adding full user pose tracking and by using 3D clothing models combined with cloth simulation instead of 2D images.
4. “Design and Implementation of Interactive Augmented Trial Room Author: Dr. N.Pughazendi, G.Madankumar, R.Rajkumar, R.Ramsuraj”  
This paper gives user friendly visual interface which auto-detect the human face and tries to merge the chosen accessories (either jewelry or eye-glasses) on them using a webcam as an input device and displays it to the screen based on Augmented Reality [AR]. With this, a lot time is saved to choose the accessories in a virtual display. To achieve this we use HAAR algorithm which takes the responsibility to detect the face thereby merging the accessory. Here the accessories are merged using the joints and position of the coordinates. Thus by doing so, the accessories are automatically positioned to the detected human face using an affine transformation. In addition, our proposed paper also detects the red pixels on the user’s finger tip to change the accessories based on the gesture automatically. Thus this makes an user-friendly virtual trial room application instead of a real-time trial room.
5. “Human Friendly Interface Design for Virtual Fitting Room Applications on Android Based Mobile Devices author: Cecilia Garcia Martin, Erdal Oruklu”  
This paper presents an image processing design flow for virtual fitting room (VFR) applications, targeting both personal computers and mobile devices. The proposed human friendly interface is implemented by a three-stage algorithm: Detection and sizing of the user’s body, detection of reference points based on face detection and augmented reality markers, and superimposition of the clothing over the user’s image. Compared to other existing VFR systems, key difference is the lack of any proprietary hardware components or peripherals. Proposed VFR is software based and designed to be universally compatible as long as the device has a camera. Furthermore, JAVA implementation on Android based mobile systems is computationally efficient and it can run in real-time on existing mobile devices.

### III. PROPOSED SYSTEM

Looking for garments is a typical day by day movement both in-store and on the online sites. An in-store customer more often tries on some chose garments and inspects how well they fit. While an online customer more often than not checks how well the garments fit the models in the on the online pictures. Firstly, in a physical store, with a specific end goal to try on some selected clothes is a typical practice is to line up and alternate to utilize the changing rooms. Because of the set number of in-store changing rooms, customers usually have to spend most of their shopping time on lining up. To close what have been observed, both in-store and internet shopping have unavoidable constraints which offer ascent to clients unsatisfied shopping encounters and in addition the retailers misfortunes of potential sells. Clients would have perceive to see the visual picture of how they look like by attempting on garments basically, with the goal that they can effectively sift through a few choices without alternating to utilize the fitting rooms.

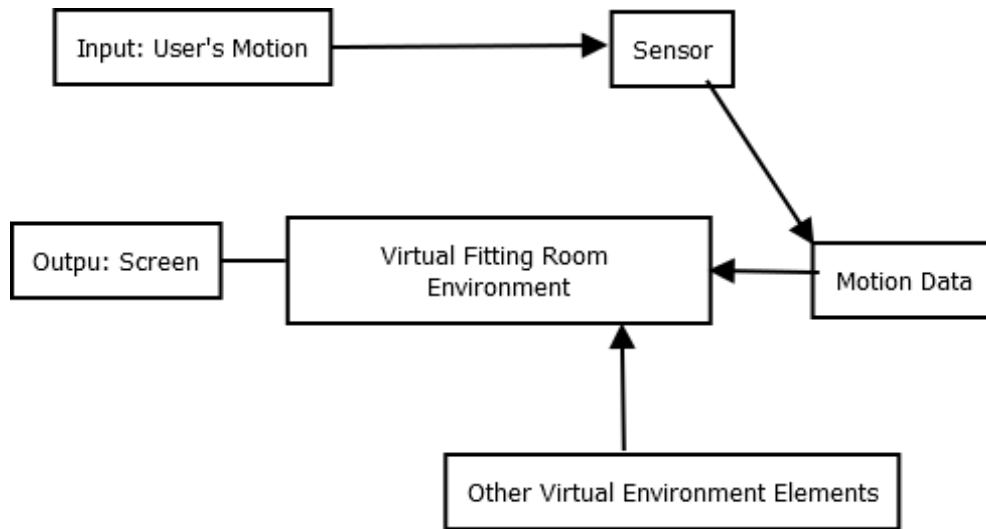


Fig. 1. Block Diagram

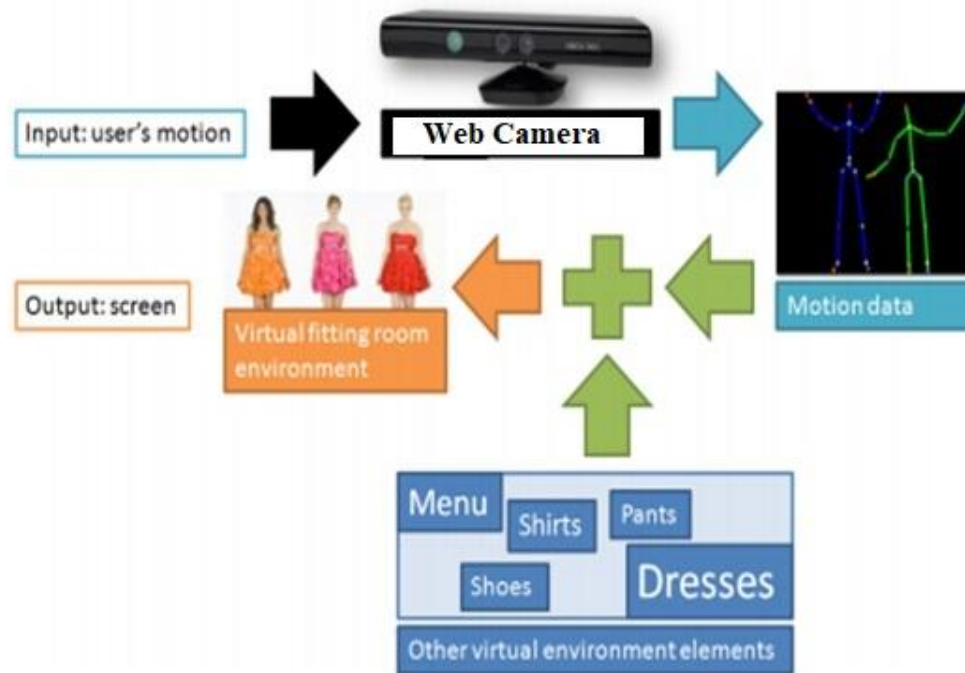


Fig. 2. System Architecture

#### IV. ALGORITHM

##### Marker Detection Algorithm

- Divide image in regions:** When the image is received, it is divided into regions of  $40 \times 40$  pixels and there are horizontal and vertical scan lines every 5 pixels.
 

```

                int chunkWidth = 40;
                int chunkHeight = 40;
            
```

```

int count = 0;
BufferedImage imgs[] = new BufferedImage[chunks];
/* Image array to hold image chunks*/
for (int x = 0; x < rows; x++) {
for (int y = 0; y < cols; y++) {
//Initialize the image array with image chunks
imgs[count] = new BufferedImage(chunkWidth, chunkHeight,
image.getType());
// draws the image chunk
Graphics2D gr = imgs[count++].createGraphics();
gr.drawImage(image, 0, 0, chunkWidth, chunkHeight, chunkWidth * y, chunkHeight
* x, chunkWidth * y + chunkWidth, chunkHeight * x + chunkHeight, null);
gr.dispose();
}
}

```

- **Detect edges in regions:** For each region, a Gaussian derivative filter is used to detect the black/white edges. The filter used is  $[3 \ 5 \ 0 \ 5 \ 3]^*A$ . Once an edge is detected a Sobel operator is used to determine the orientation of the edges.
- **Extend lines along edges:** So far only pixels on scan lines were scanned. Now, the lines are extended pixel by pixel until a detected corner or until there is no edges. The green lines displayed on Figure 5 represent the extension of the previous red lines from one corner to another corner
- **Find Segments:** A Random Sample Consensus grouper algorithm is then used to create the line segments in the regions. This algorithm groups series of points that can be fitted into lines. First, it arbitrarily takes 2 points of the same region with the same orientation, then the close points that have a compatible orientation are added to the line segment. Finally, lines containing at least 4 segments are considered as a detected line.
- **Keep lines with corner:** The lines with at least one corner are kept.
- **Find markers:** Chains of 3 or 4 lines are kept. A chain of line is found when the end of one line corresponds to the beginning of the second one. The rectangles with a black inside are checked as markers
- **Identify markers:** The last step is to identify the inside of the marker to check that it is our marker. As we can see on the left picture, this step only checks that the marker has a black center and is white on the in- side of the boundaries

## V. RESULT

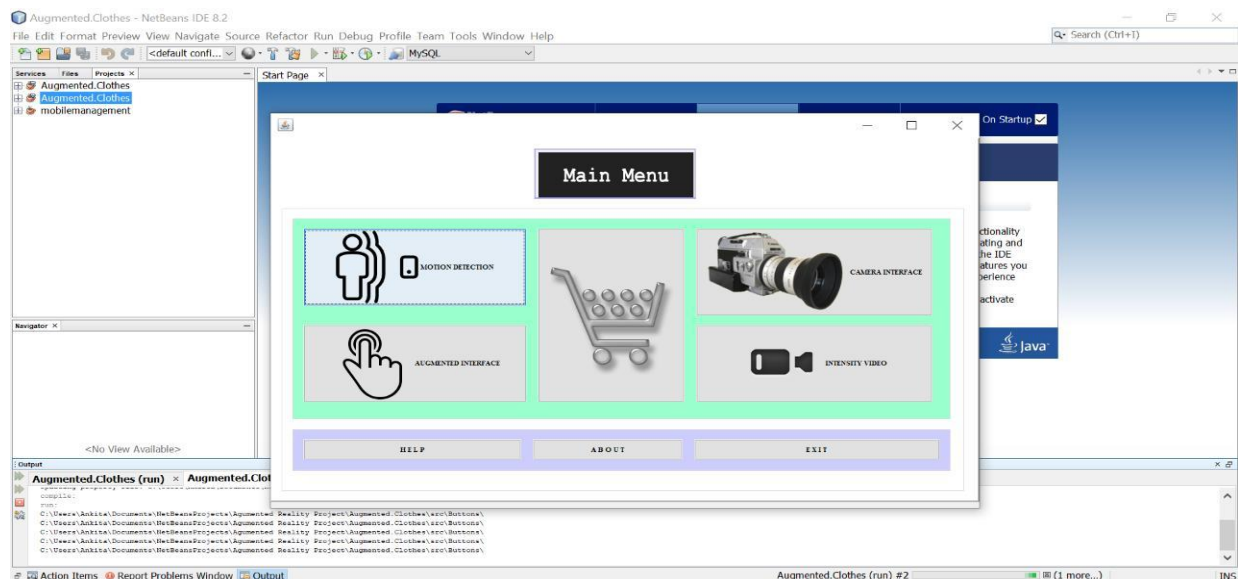


Figure 3: Home Page

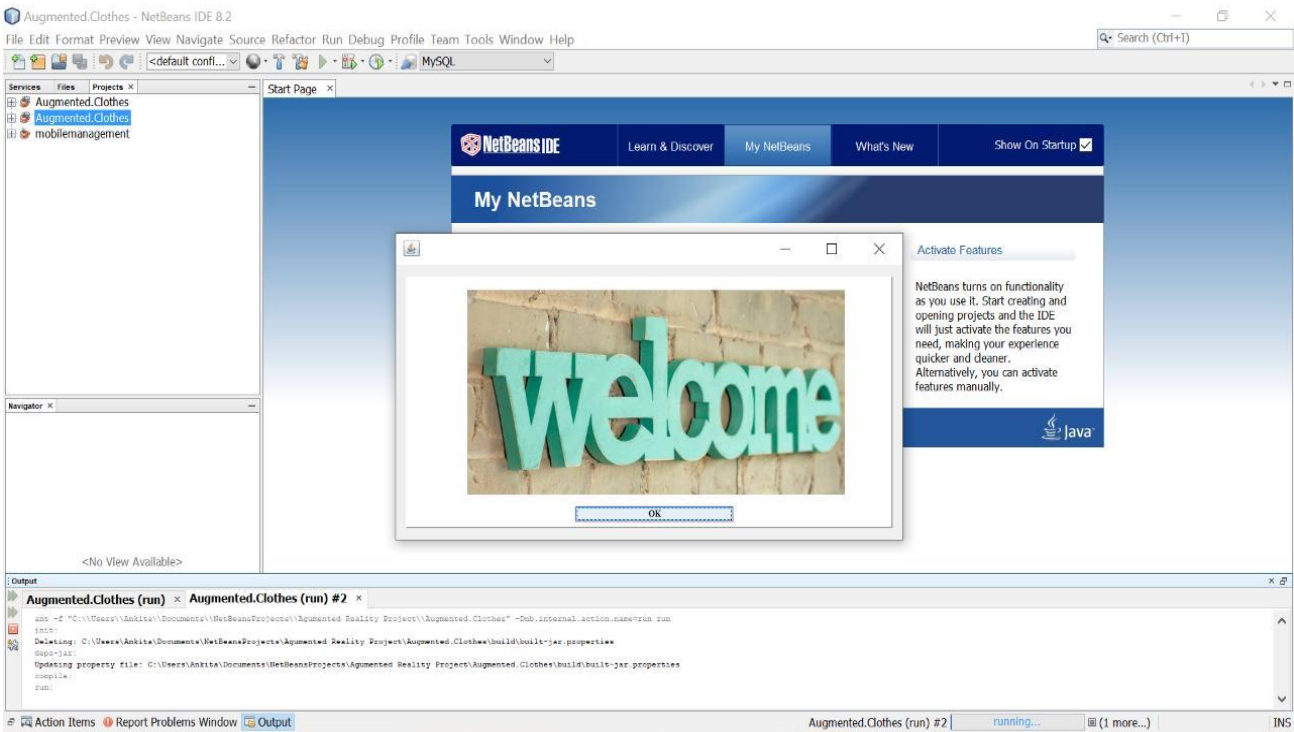


Figure 4: Welcome Message

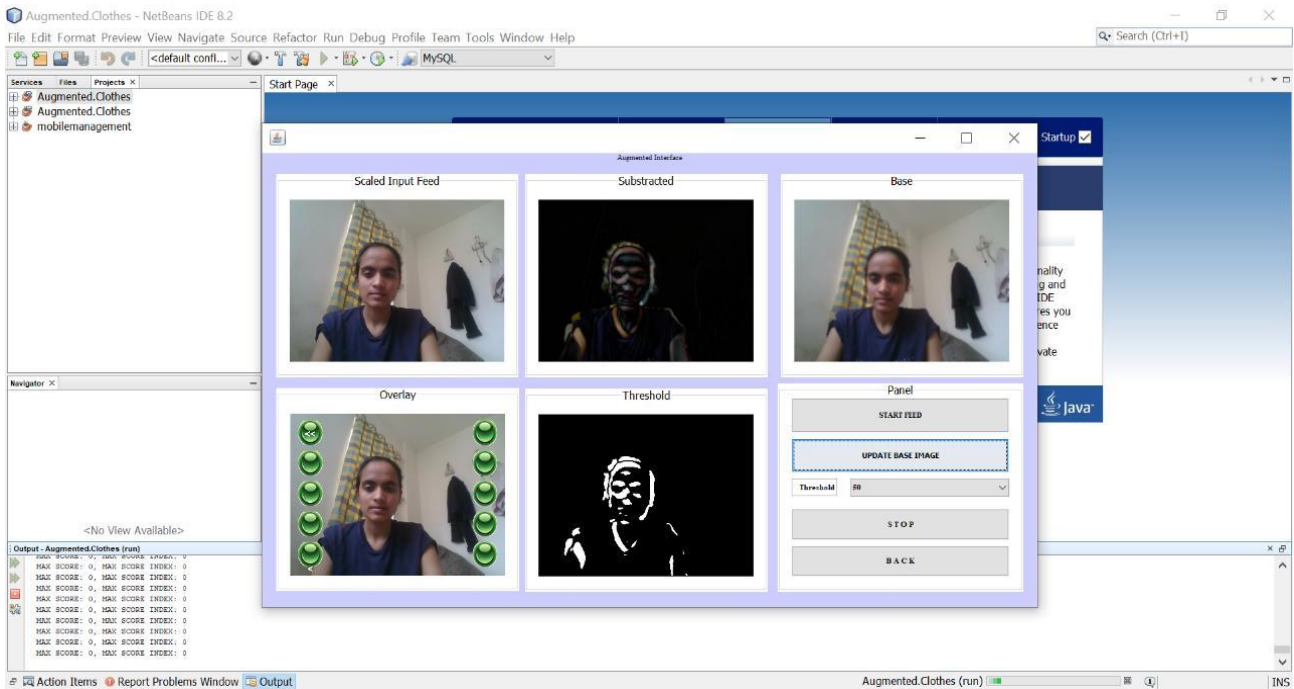


Figure 5: Update Base Image

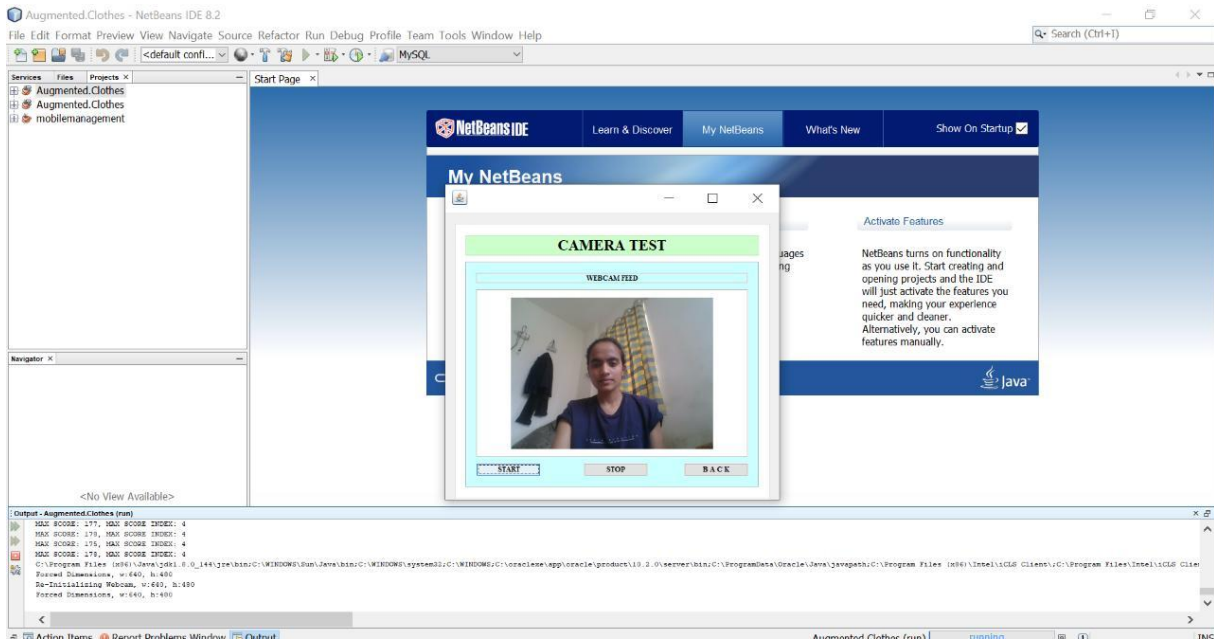


Figure 6: Camera Test

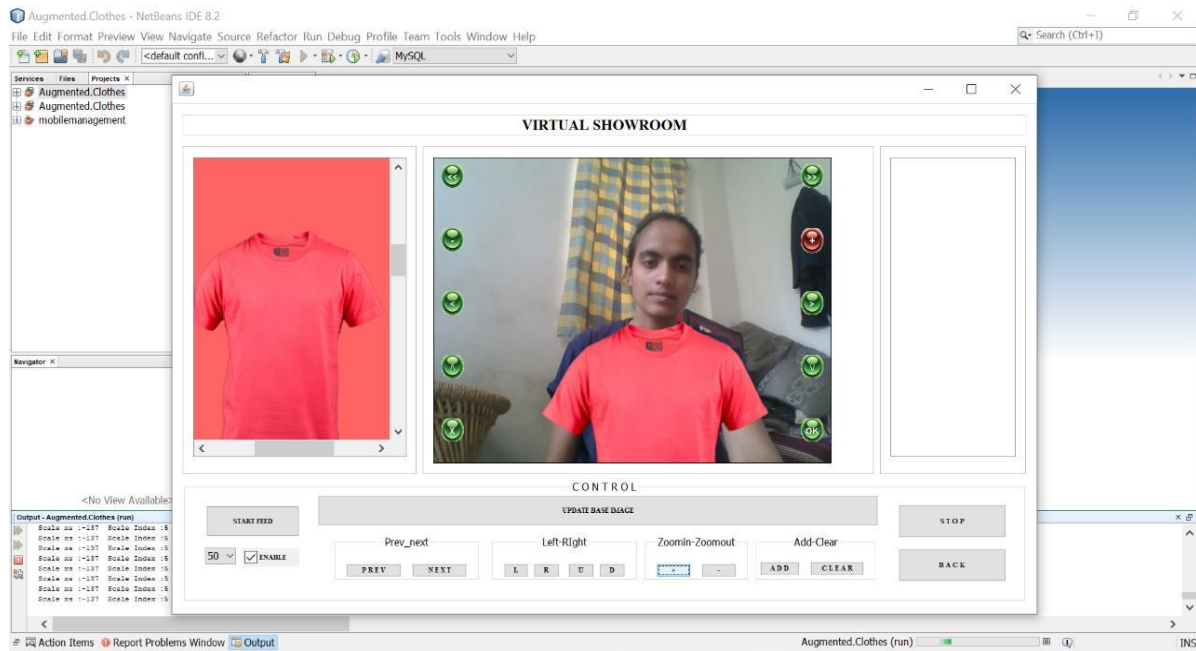


Figure 7: Virtual Showroom

## VI. APPLICATIONS

- In large shopping malls.
- In jewelry shops

## **VII.CONCLUSION**

In this paper we proposed a presents the observations in clothes shopping experiences and figures out the potential problems. The Virtual Fitting Room system is introduced and implemented which is aimed to increase customer's satisfaction during clothes shopping. Presents the system design, the preparation process and the iterative implementation process of the Virtual Fitting Room system. In addition, different types of evaluations have been done, and the final result of the system evaluation shows that the system meets general people's needs.

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3. VIRTUAL TRIAL ROOM USING AUGMENTED REALITY Author: Shreya Kamani, Neel Vasa, Kriti Srivastava
4. Design and Implementation of Interactive Augmented Trial Room Author: Dr. N.Pughazendi, G.Madankumar, R.Rajkumar, R.Ramsuraj
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