



## **Size and Fit in Online Shopping Experience Indian Institute of Technology, Guwahati**

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# Problem Statement- Size and Fit



- E-commerce, which is a **rapidly growing sector** now, to be more precise let us take the **clothing area** of e-commerce. One of the most pertinent problems online fashion faces is the customer dissatisfaction due to difference in expected and original size.
- Another big challenges online fashion faces is the **large volume of returns**. According to a survey , 23% of all clothing gets returned, and 64% of consumers say incorrect fit is the primary reason they return clothing. Size and Fit is a multidimensional problem influenced by various factors like inconsistency in size chart across brands, different body types and Individual fit choices.
- Nowadays, even though technology has advanced so much, a wide group of people still resist buying clothing online. This happens majorly due to **dissimilarity in size charts** of different companies, **improper size and fit, high diversity in the body types** of consumers. As the survey by Body Labs even suggests, a very big number of consumers(64%) don't prefer online shopping just due to **incorrect fit**.
- Our aim is to bring out an effective solution to the **multidimensional problem of size and fit**. The solution must solve the major issues of **generating trust** among users, creating a solution for **uniform sizes across companies** and provide a method to show **how each specific product looks on every body type** .

# Proposed Solution



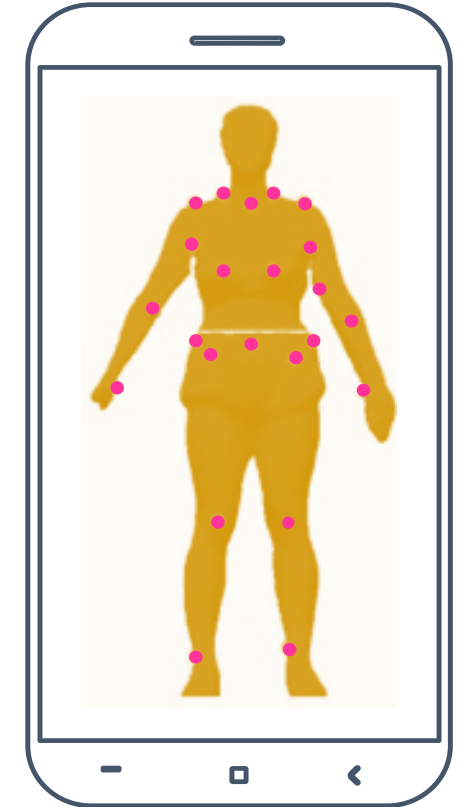
## "Discover and demand"

### Discover

Our solution uses a combination of **computer vision and anthropomorphic science** to deduce the positions and measurements of several body points from images taken by the users then **matches these to the company's size chart**, previous **databases** on the size and their body type. This then suggests the **optimum size** for the specific product and company.

### Demand

The customer can use the suggested size to **demand items** of their choice. Further **virtual dressing room** helps the customer get a feel of the **fit and look** of the product on their own body type, thus reducing confusion and providing a **hassle-free shopping experience**.



# Solution Depth



1.

## Implementation Of Image Based Size Detection

### i- OpenCV

**Contour-based Computer Vision model**, consisting of contour and width of the body torso and limbs, where body parts are presented with boundaries and rectangles of a person's silhouette to provide us with precise body sizes.

### ii- Deep Learning: 2D/3D Pose Estimation Models

**Deep Convolutional Network**, a neural network for 2D/3D pose detections. The estimated poses will be encoded into a compact image-based representation and finally fed into the network for supervised classification task to give us body sizes.

2.

## Creating Virtual Dressing Rooms Augmented Reality(AR)

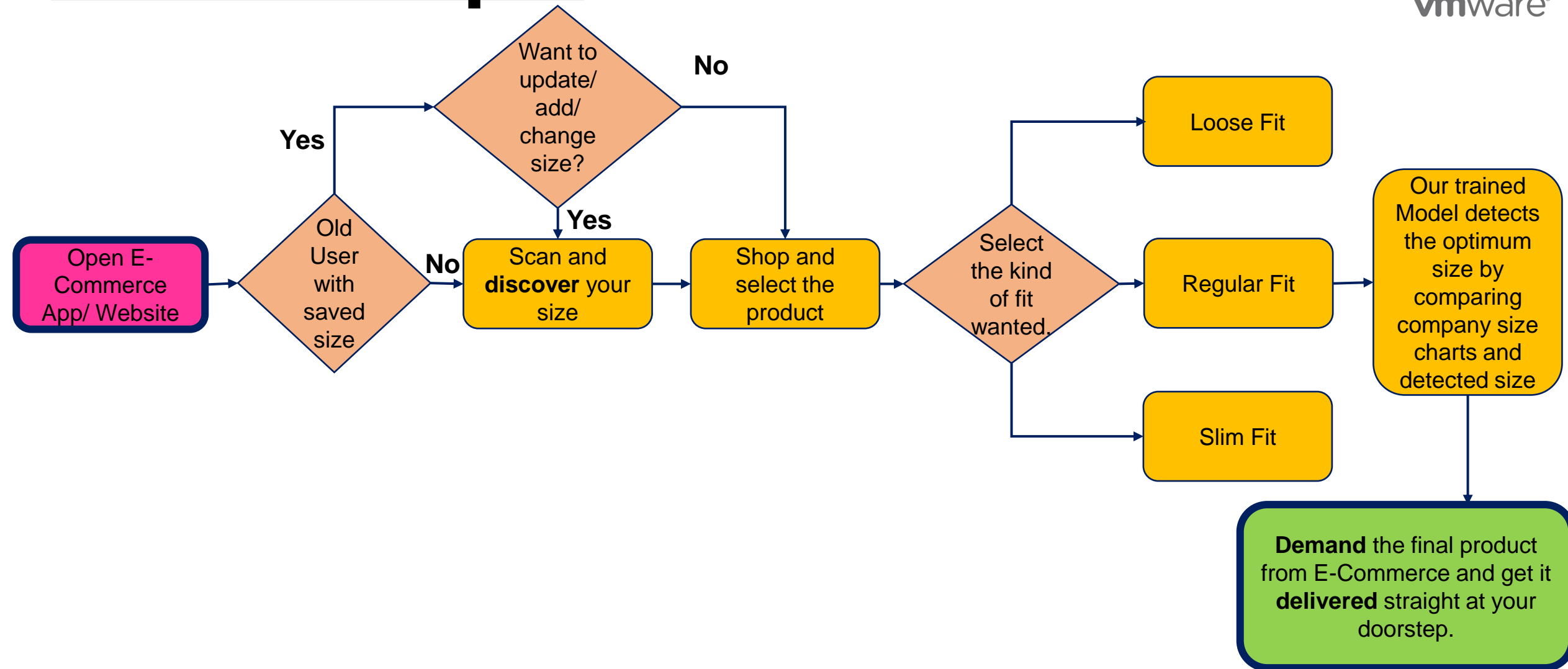
Creation of **Virtual Dressing Rooms** uses AR technology that work by superimposing the 3D model or picture of different clothes and accessories to show how it will look on a person in real time. AR virtual dressing rooms usually require a desktop webcam, a smartphone camera or 3D camera such as Kinect to function.

3.

## Deployment using Flask

Flask- a web framework with it's useful base tools, libraries and features provide developers an easy way to create web applications(in our case adding new features to the application as well as website). The aforementioned features will be added using the **Flask Python web framework**.

# Solution Depth



# Impact



Issue	Solution	Impact
Lack of awareness of actual size measurements	Using <b>Contour-based Computer Vision model</b> we can predict the accurate measurements of customers.	<b>Product returns</b> due to incompatible sizes will be <b>reduced</b> .
Difference in size charts across companies	<b>ML model</b> utilizes the <b>databases</b> of previous product reviews and predicts measurements according to every brand's size chart and <b>suggests optimum size</b> .	<b>Uniformity in size</b> across all brands <b>enhances the brand image</b> and builds consumer <b>trust</b> .
Differences in product fit for each body type	<b>Virtual dressing rooms</b> based on <b>augmented reality</b> gives a feel of the fitting.	Reduces customer confusion while shopping and helps them <b>visualise the fit better</b> , thereby improving <b>customer satisfaction</b> .

# Implementation

**1**

## Data extraction and integrity

Creating a database of different company's size chart, customer feedback and corresponding size detected by our model.

**3**

## Incorporating Deep Learning frameworks

Processing the images received from OpenCV model using Tensorflow's Object Detection API and tweaking neural networks. Incorporating in-built models for more accuracy.

**5**

## Deployment of feature

Deploying these new features into website and application using micro-framework of flask.

## OpenCV model

Building real-time object recognition model to collect different angle images and identify body type using OpenCV.

**2**

## AR implementation

Imposing the images collected into a virtual 3-D environment to show accurate visualization of the product fit in a virtual trial room.

**4**

## Testing and Feedback Collection

Models and frameworks built would be tested for any bugs and respective improvements through the feedback collected.

**6**



**Thank  
You!**