



# DESIGNING MACHINE LEARNING

*A Multi-Disciplinary Approach*

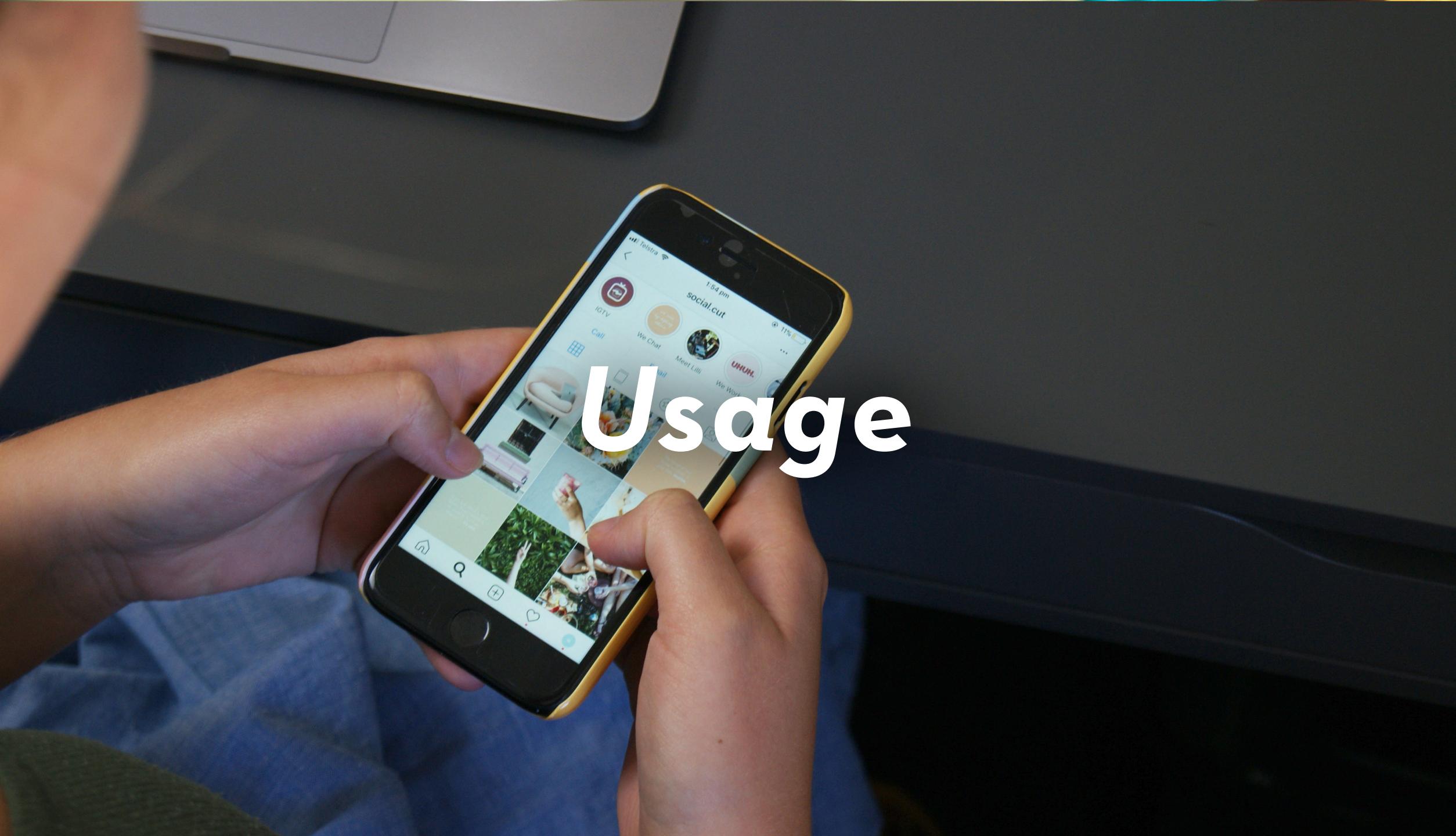
# ***Human-Machine Interaction***



**Labeling Data**



**Ideation**



**Usage**



**Feedback**

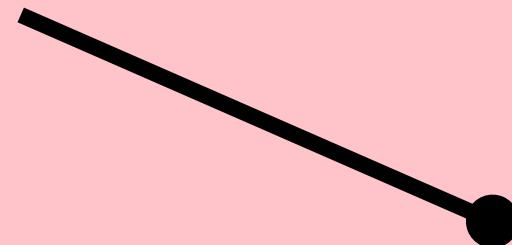


***Labeling Data***

**Selective Labeling**



**Human Labeling  
Interface Design**



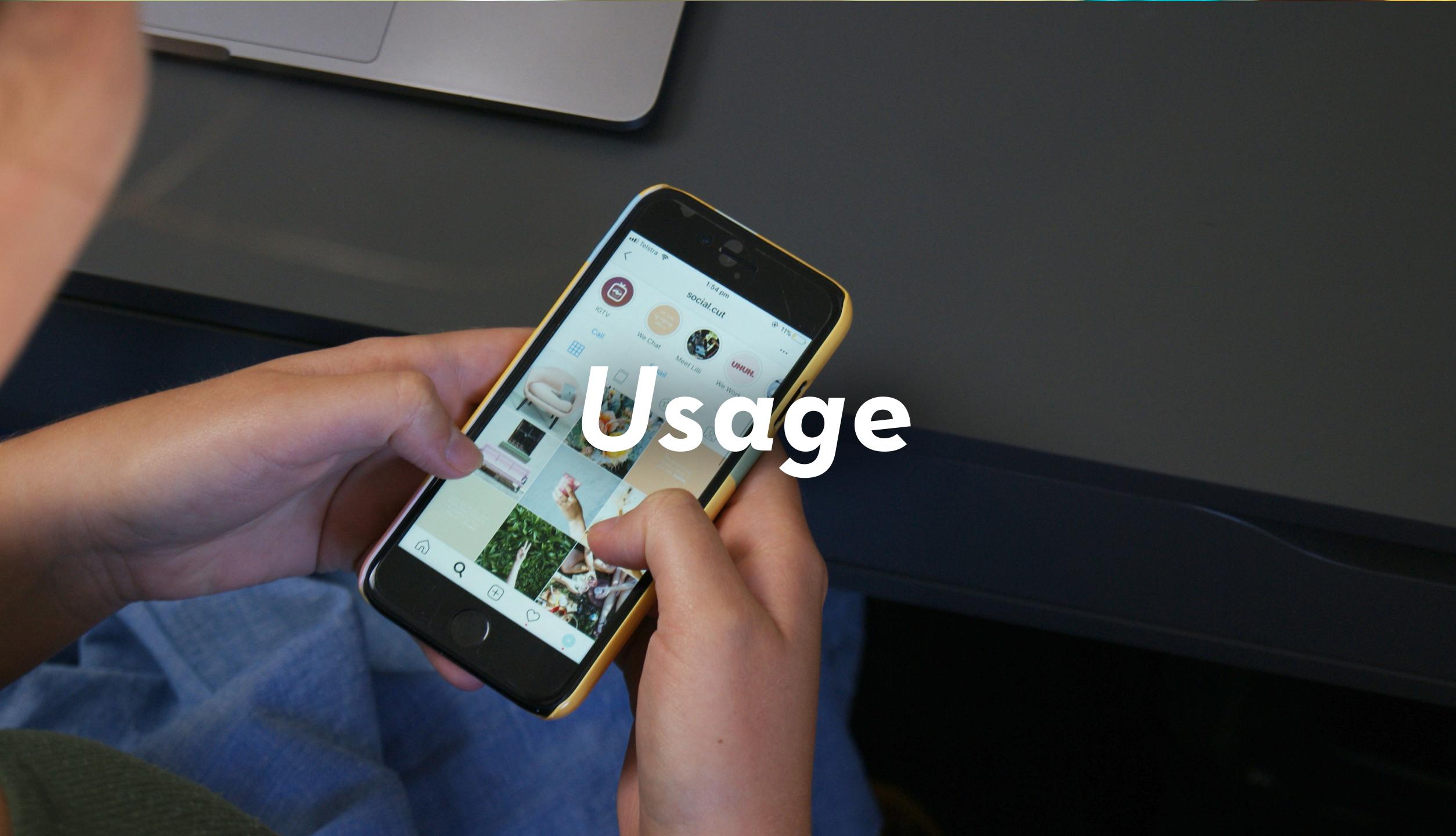
**Machine Assisted  
Human Labeling**



**Labeling Data**



**Ideation**



**Usage**

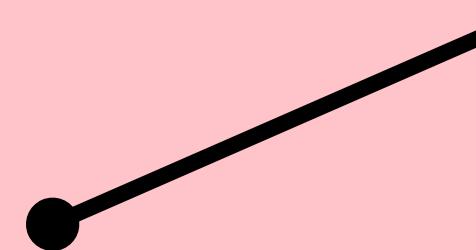


**Feedback**

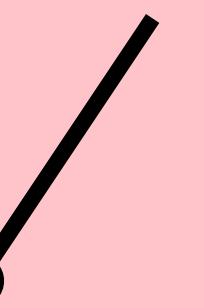
Data Exploration  
Tools



Generative  
Design



Clustering

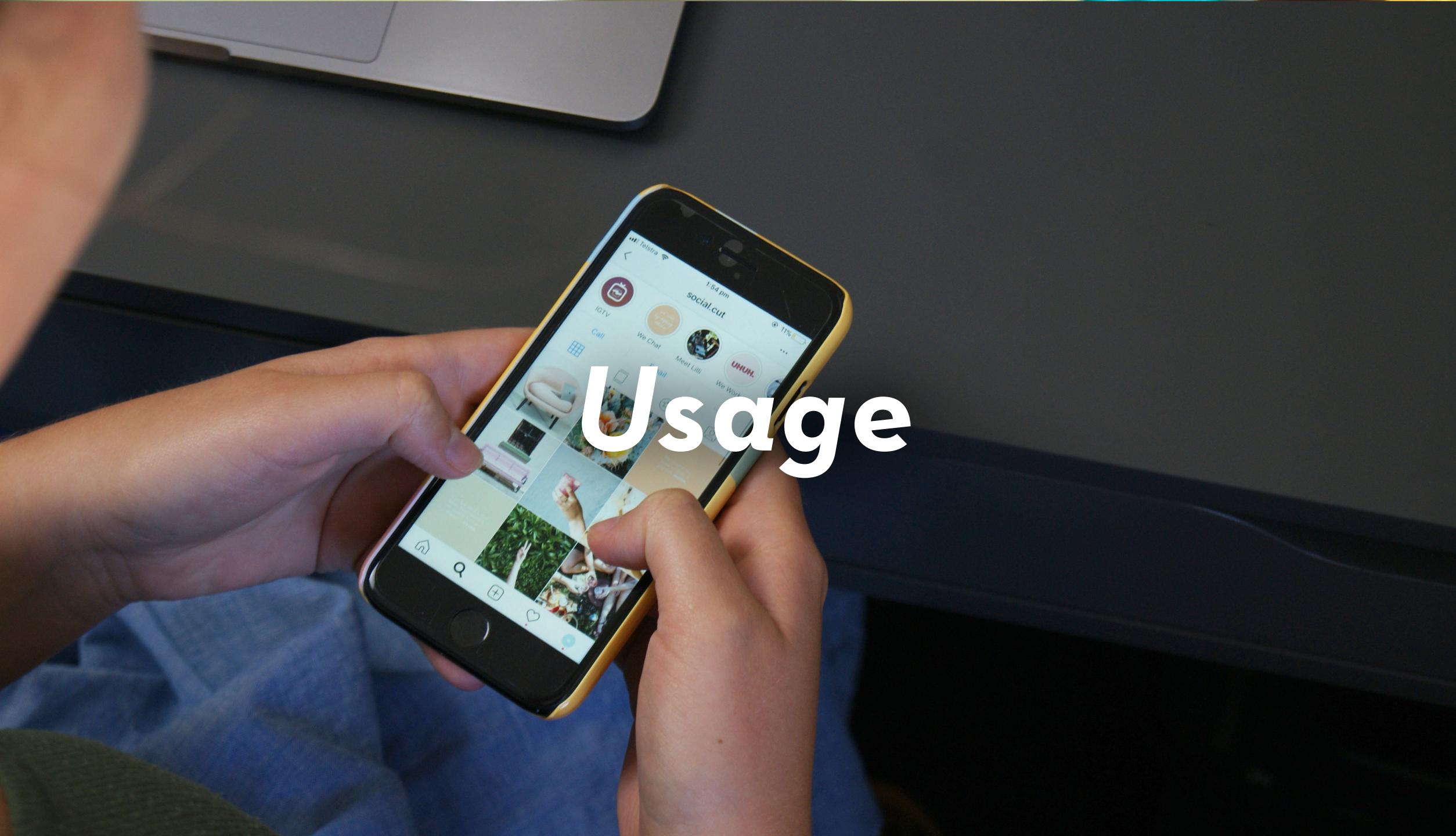




**Labeling Data**



**Ideation**

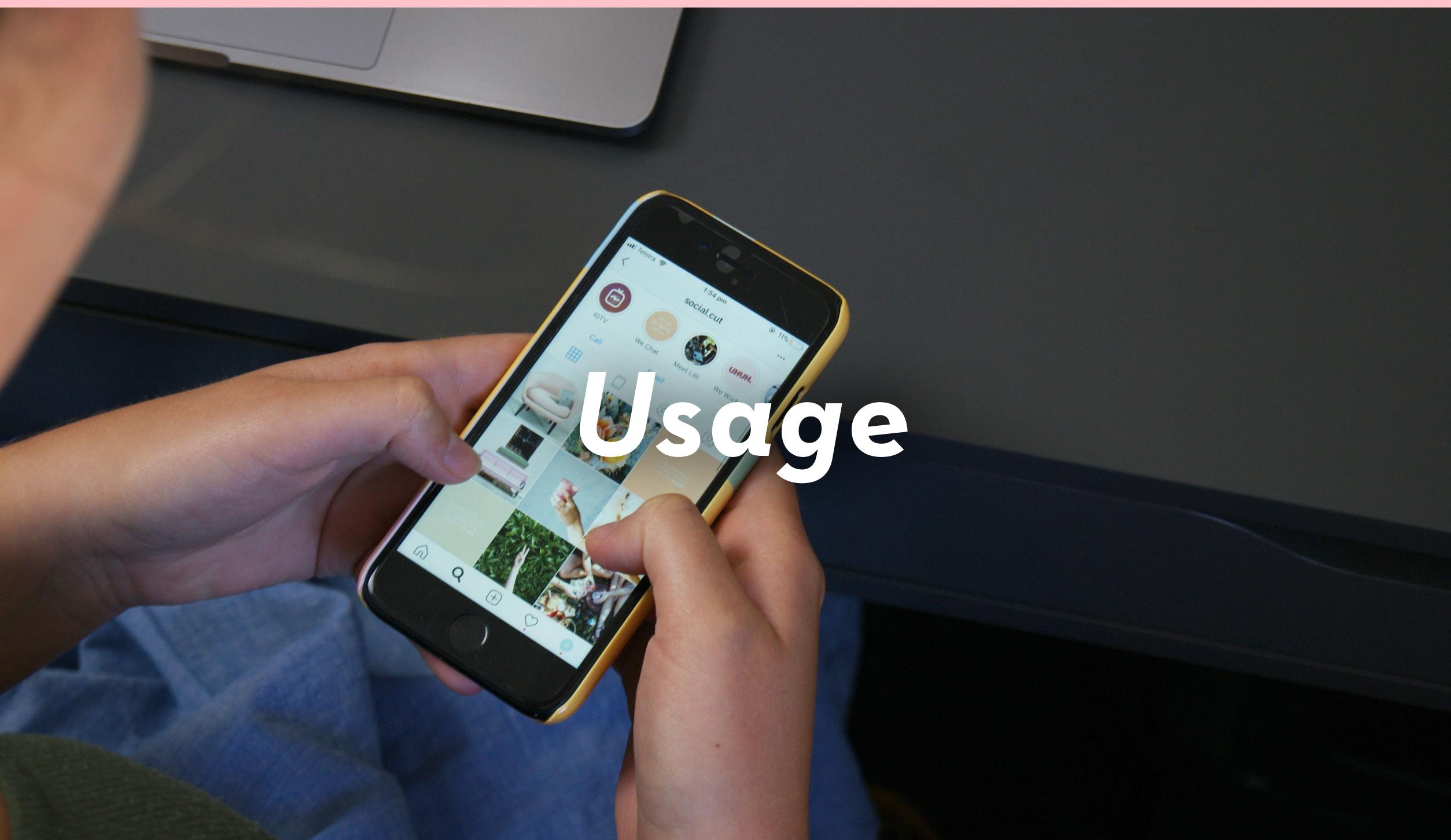
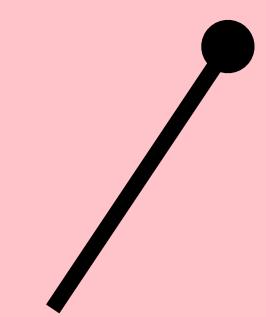


**Usage**

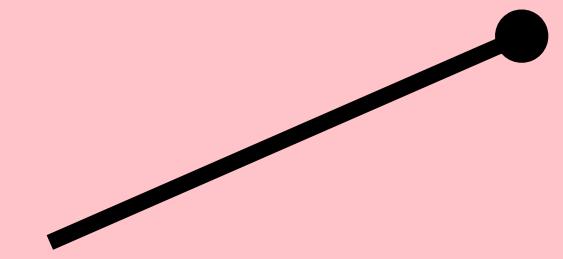


**Feedback**

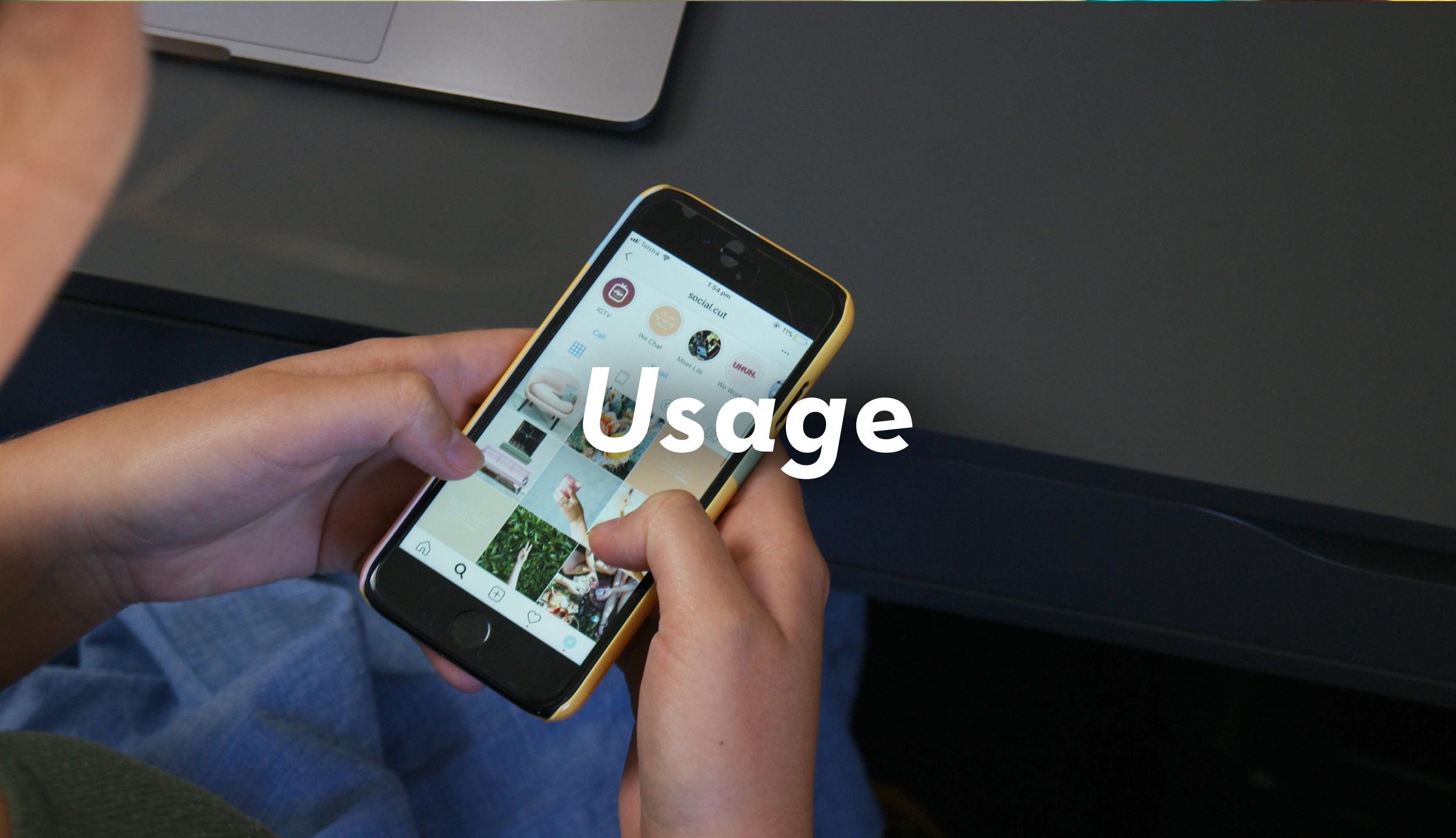
## Personalized and Adaptive Interfaces



## Interacting with Recommenders and Classifiers



Augmented Interfaces



## Human adjudication and Escalation Processes

Explainability and Transparency



*What makes a human-  
machine interaction  
“good”?*

A woman with long brown hair and sunglasses is driving a dark-colored Audi car. She is wearing a light-colored cable-knit sweater. Her hands are on the steering wheel, which features the Audi logo. The interior of the car is visible, including the dashboard with digital displays and various controls. The background shows a blurred landscape through the windows, suggesting motion. Overlaid on the image is the text "What makes a car 'good'?" in a large, white, sans-serif font.

What makes a car  
“good”?

*...why my uncle can't use  
an autonomous vehicle...*



**Human**

**Machine**

***Human Machine Interface Design***





**Human**

**Machine**

***Human Machine Interface Design***



**Human**

**Machine**

***Human Machine Interface Design***





Human

Machine

*Human Machine Interface Design*



**Human**

**Machine**

***Human Machine Interface Design***





Human

Machine

***Human Machine Interface Design***





# **Case Study:**

## ***Visual Impairment in India***

## ***Visual Impairment in India***

- India has 1/3 of the world's blind and visually impaired people
- 75% of these cases are avoidable, but persist due to socio-economic factors and lack of access to treatment
- India has 1/5 of the necessary ophthalmologists to address their visually impaired population

# Hypothesis #1:

Auditory ‘braille’ that doesn’t require you to touch  
or know how to read braille

## ***Visual Impairment in India***



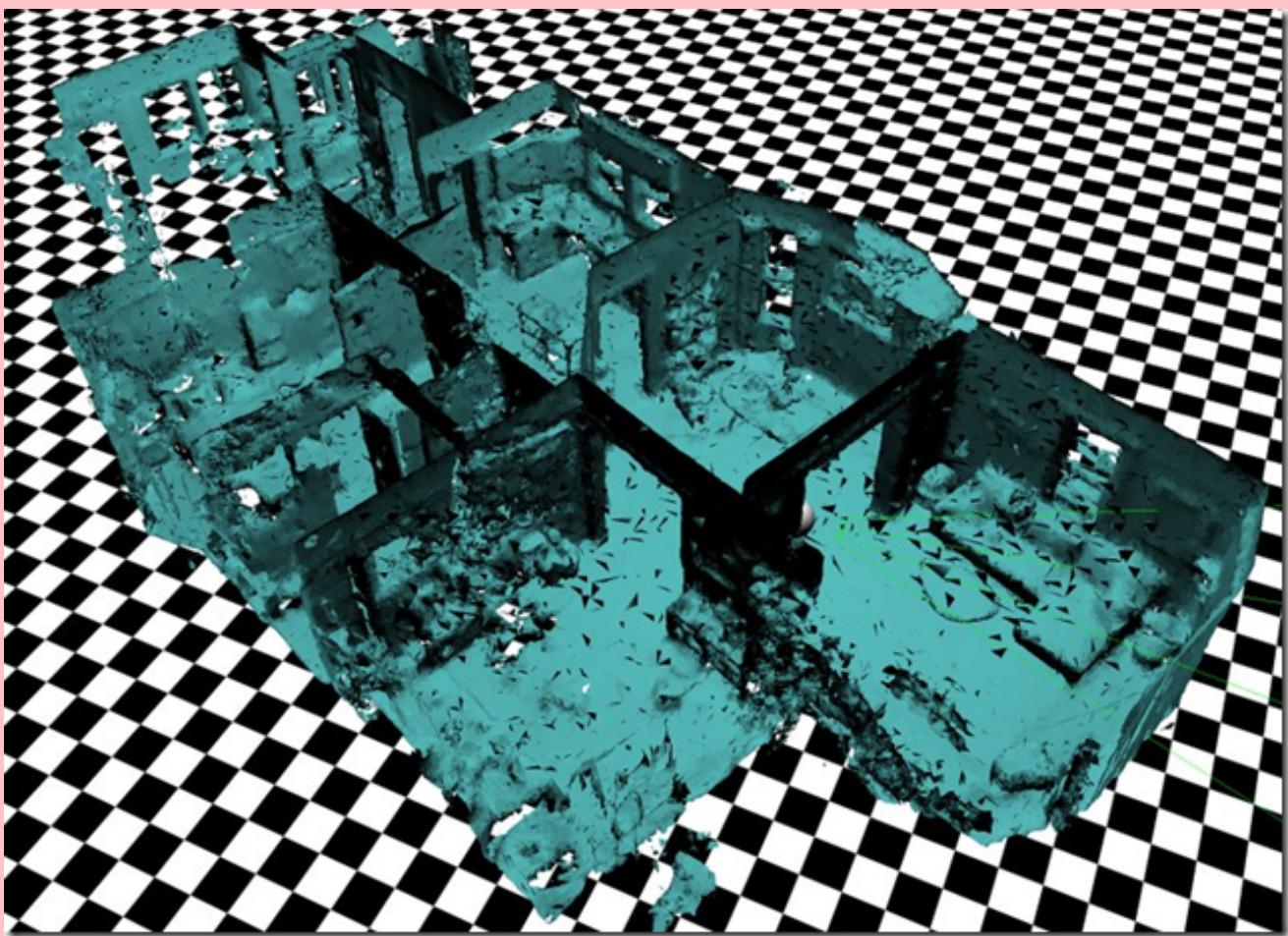
## **Hypothesis #2:**

**Augmented navigation tool that automatically creates navigation guide from point mesh**

# *Visual Impairment in India*



**HoloLens  
Augmented Reality  
Headset**

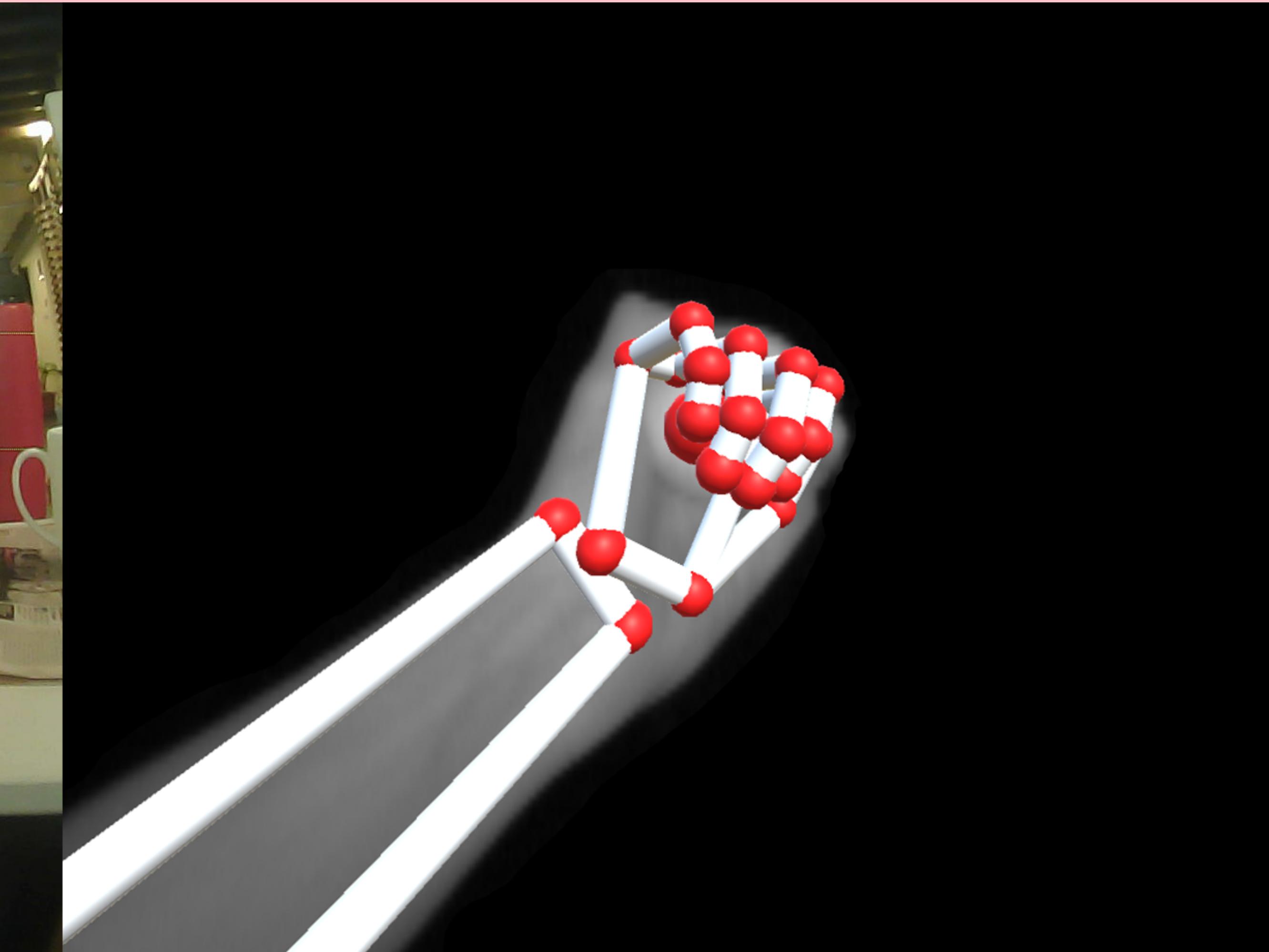


**Real-time 3D  
spatial mesh  
generation**



**Real-time navigation mesh  
floor-plan generation**

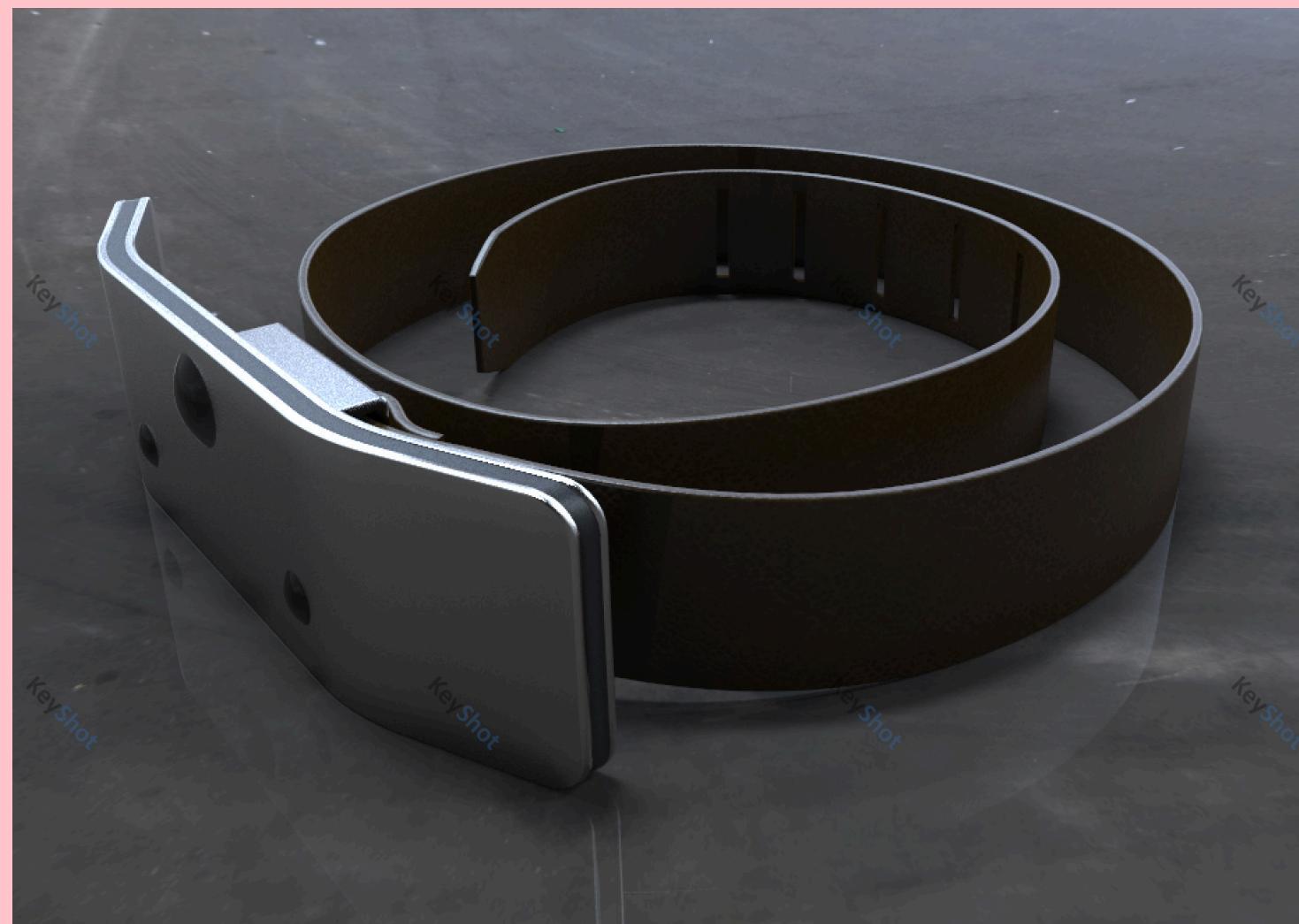
## *Visual Impairment in India*



## Hypothesis #3:

Augmented touch interface that describes objects  
when you pick them up

# ***Visual Impairment in India***



## *Visual Impairment in India*



## ***Visual Impairment in India***

