Paper Link

# Robot-Assisted Group Tours for Blind People

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This is ISS, go ahead


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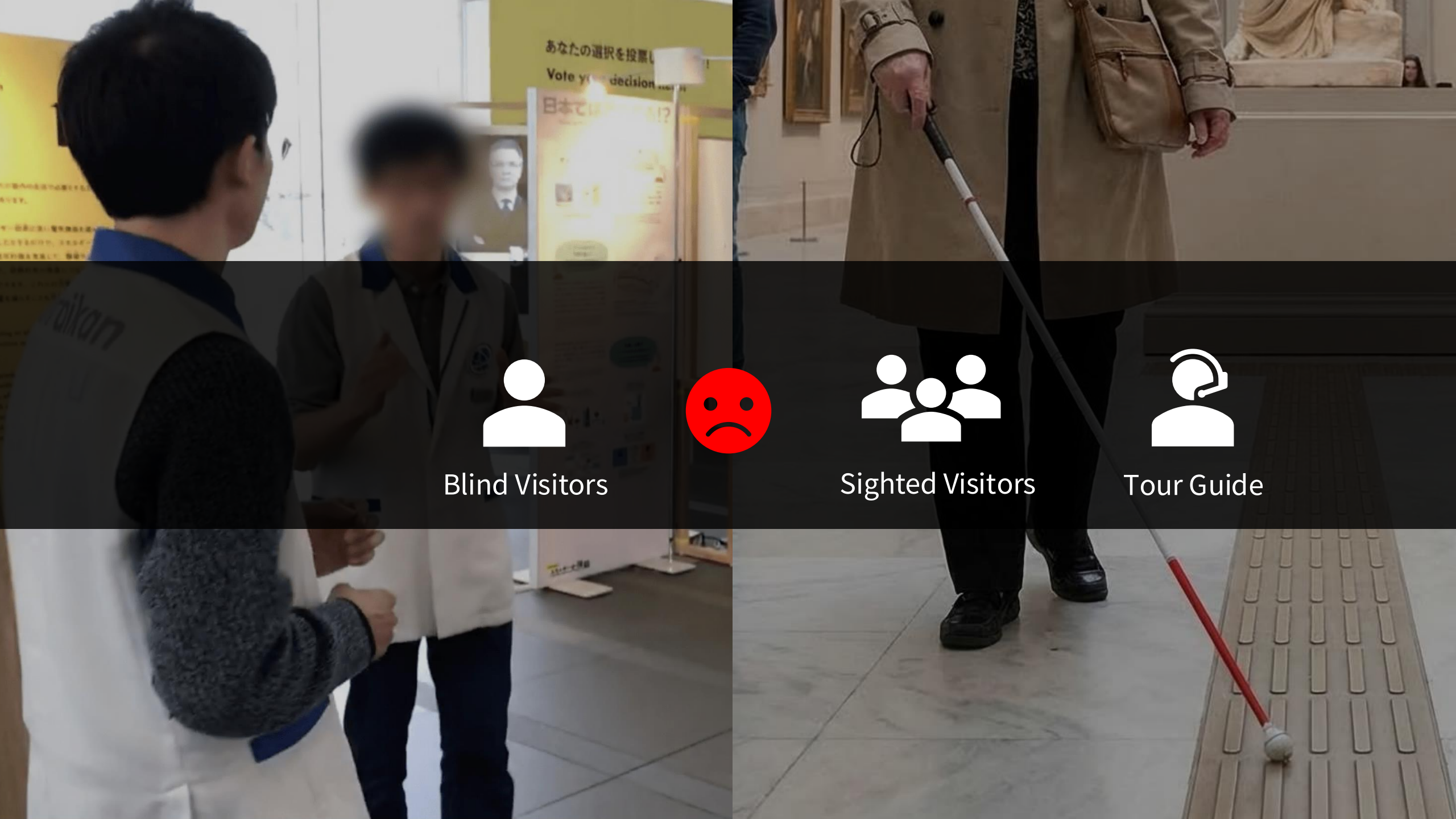
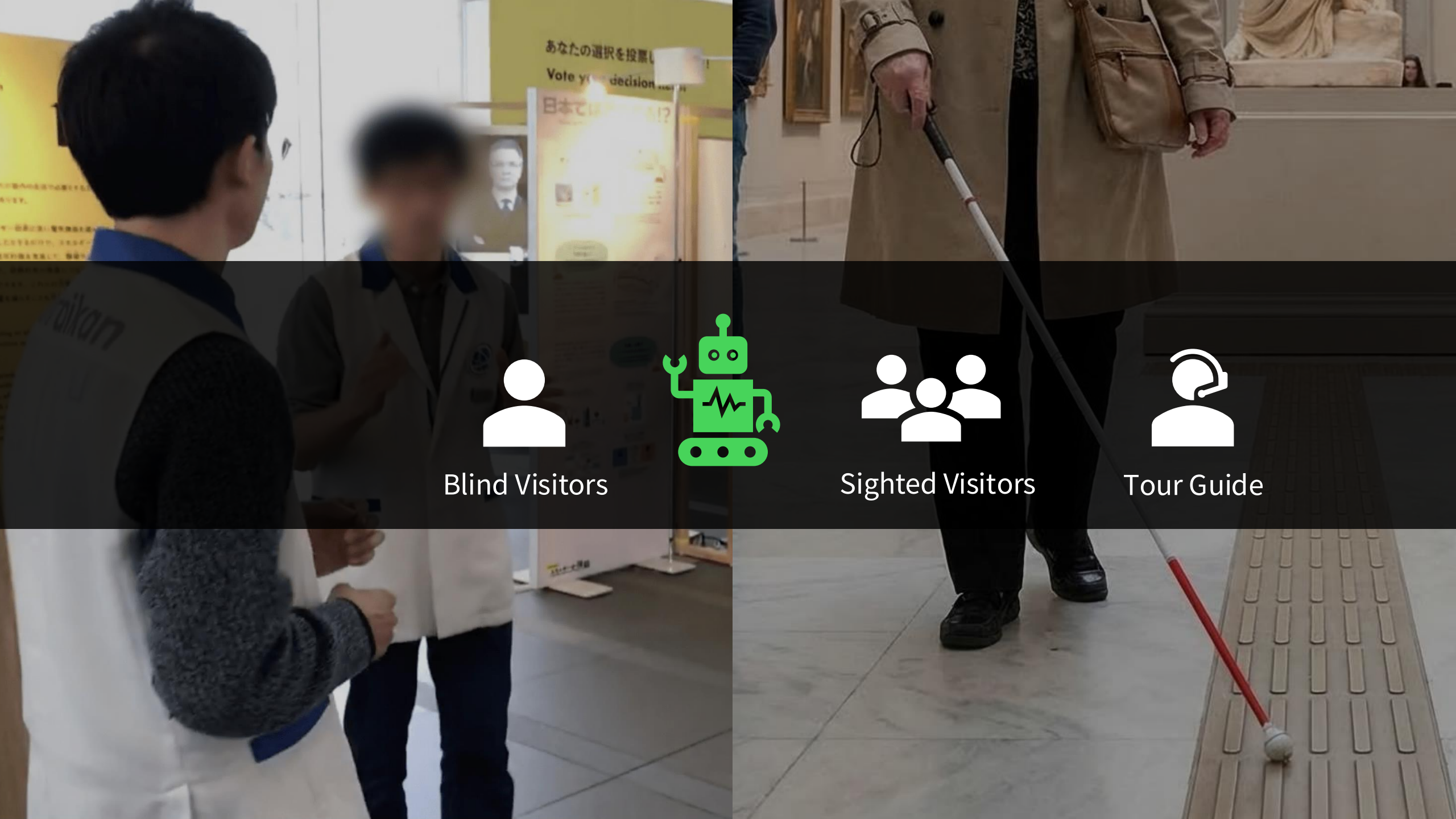
Image source: https://www.youtube.com/watch?v=V6bOUk_WB80


Blind Visitors
Sighted Visitors
Tour Guide


Blind Visitors
Sighted Visitors
Tour Guide

# Method | **Overview**

*Phase I*

Interview Studies

*Phase II*

System Design & Implementation

*Phase III*

Field Study

# Phase I: Interview Studies | **Method**

*Phase I*

Interview Studies

Interview with blind people (n=5)

Interview with tour guides (n=5)

# Phase I: Interview Studies | **Findings**

with blind people (n=5)

with tour guides (n=5)

## *General Tour Challenges*

- Communication challenges with the tour guide
- Difficulties in following the tour
- Lack of personalized tour pace

## *Blind Tour Design*

- Focus on the touch experience
- Explaining visual information
- Group tour management

## *Robot Design Insights*

**Provide explanation**
- Describe visual information
- Explain exhibits
- Point out new things

**Support group interactions**
- Find the guide
- Describe group members
- Indicate turn taking

**Support Navigation**
- Maintain appropriate proxemics within the group
- Enhance safety and give alerts

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with blind people (n=5)

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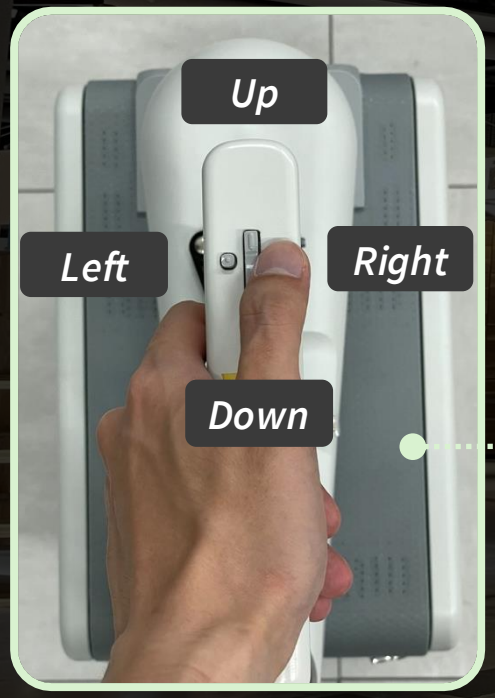
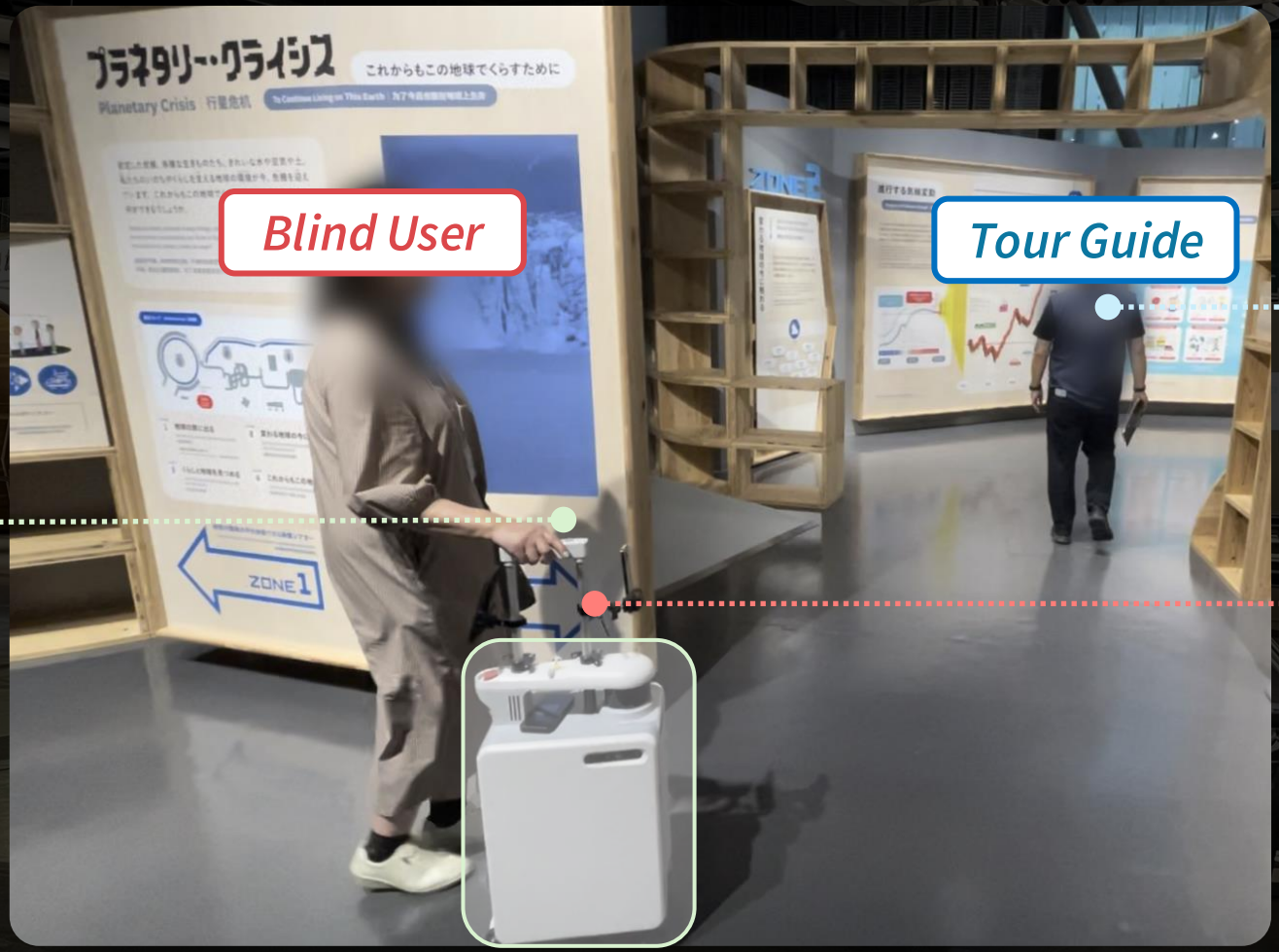
*Phase II*

System Design & Implementation

# Phase II: System | **Overview**




*Suitcase Robot*

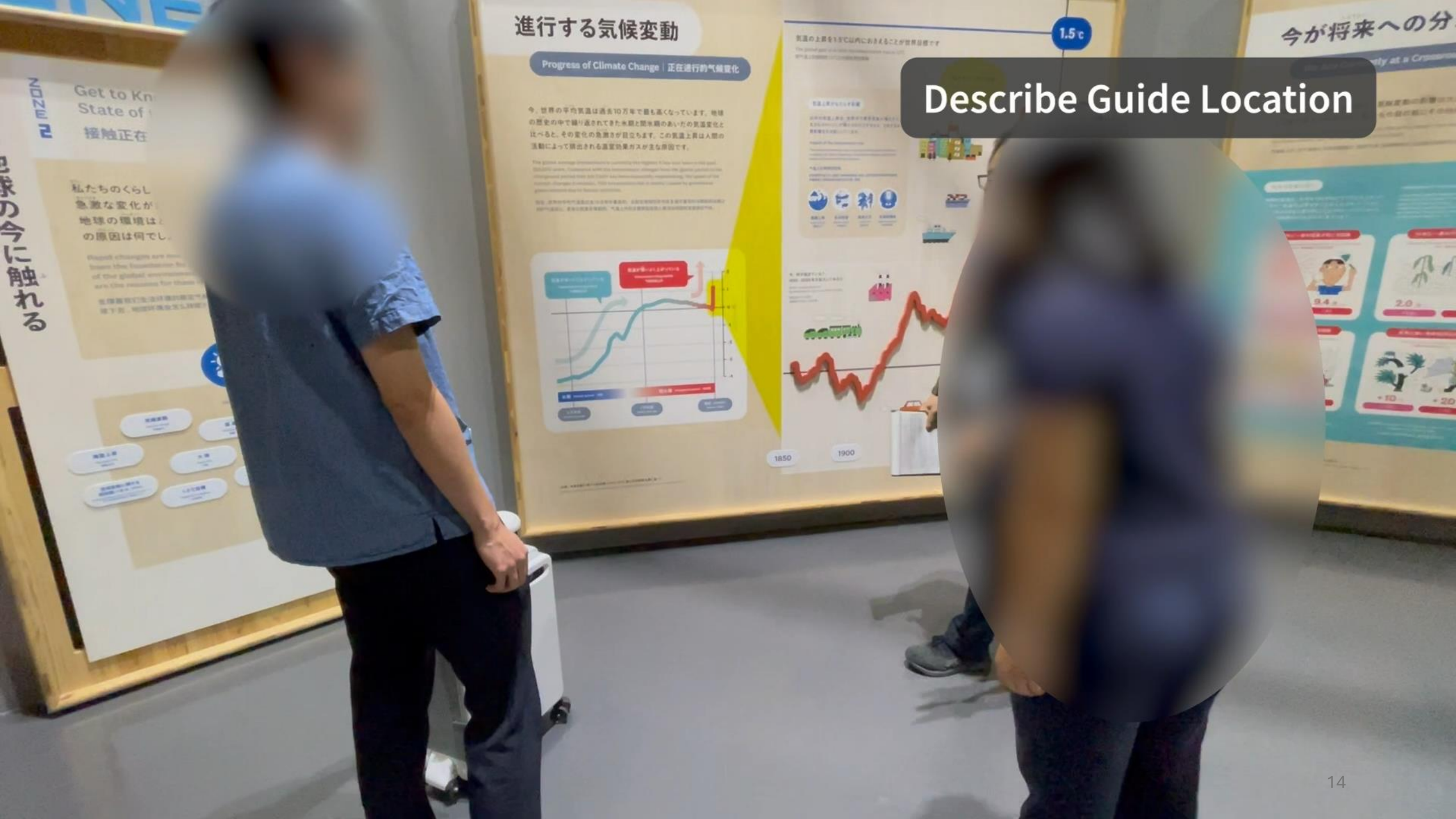



*Guide App*

*User App*

# Phase II: System | **Robot Features**

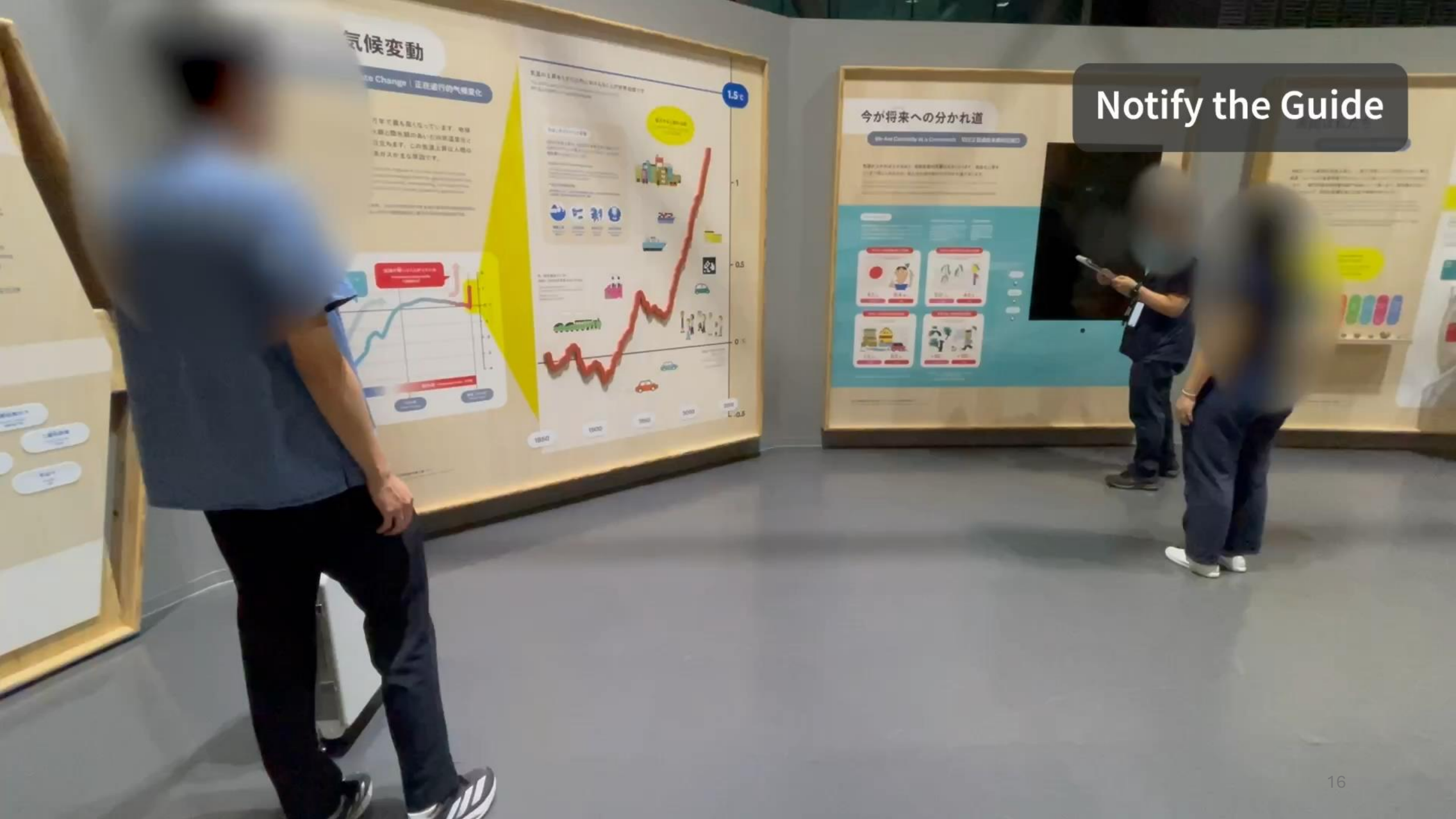
## *1. Guide Description*


Describe Guide Location
進行する気候変動
Progress of Climate Change | 正在进行的气候变化
1.5℃
1850
1900

# Phase II: System | **Robot Features**

### *1. Guide Description*


### *2. Notify the Guide*

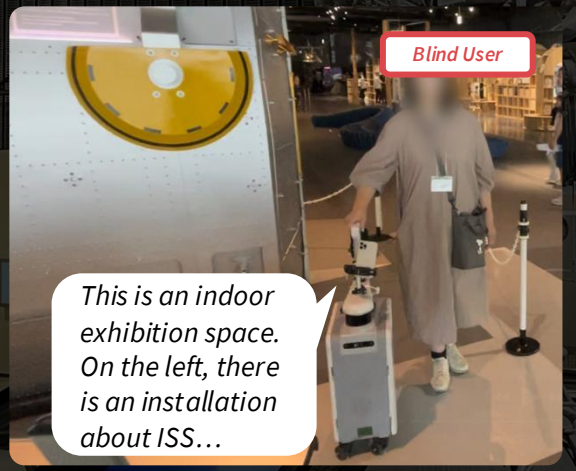

気候変動
今が将来への分かれ道
Notify the Guide

# Phase II: System | **Robot Features**

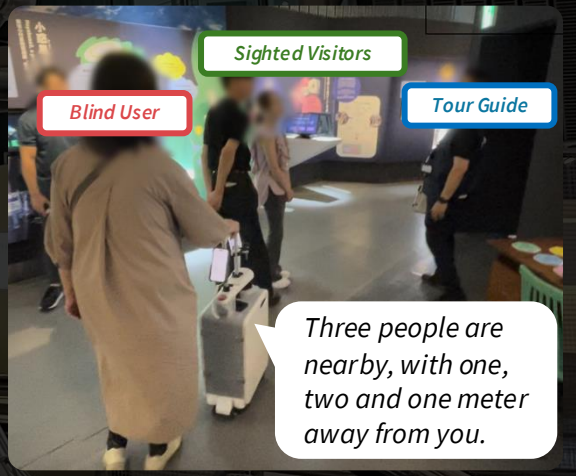
### *1. Guide Description*


### *2. Notify the Guide*


### *3. Surrounding Description*



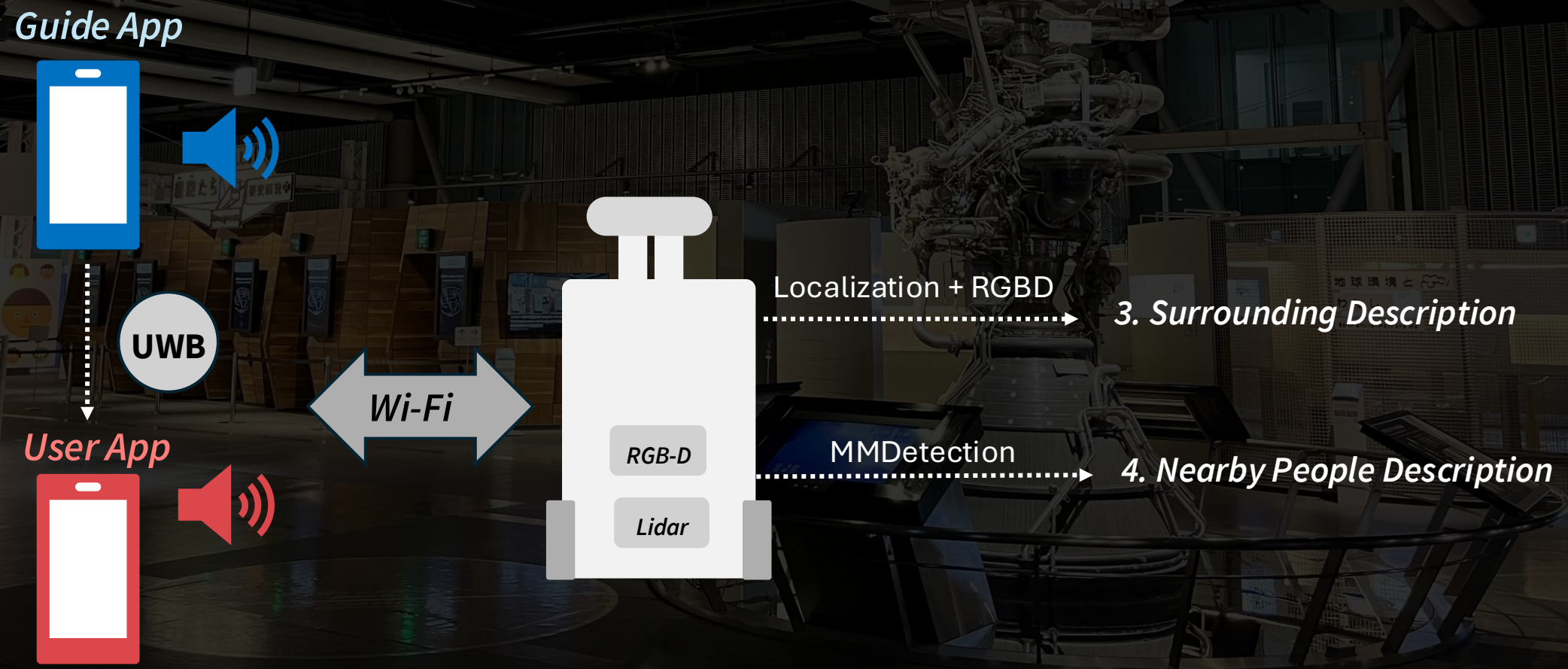

### *4. Nearby People Description*



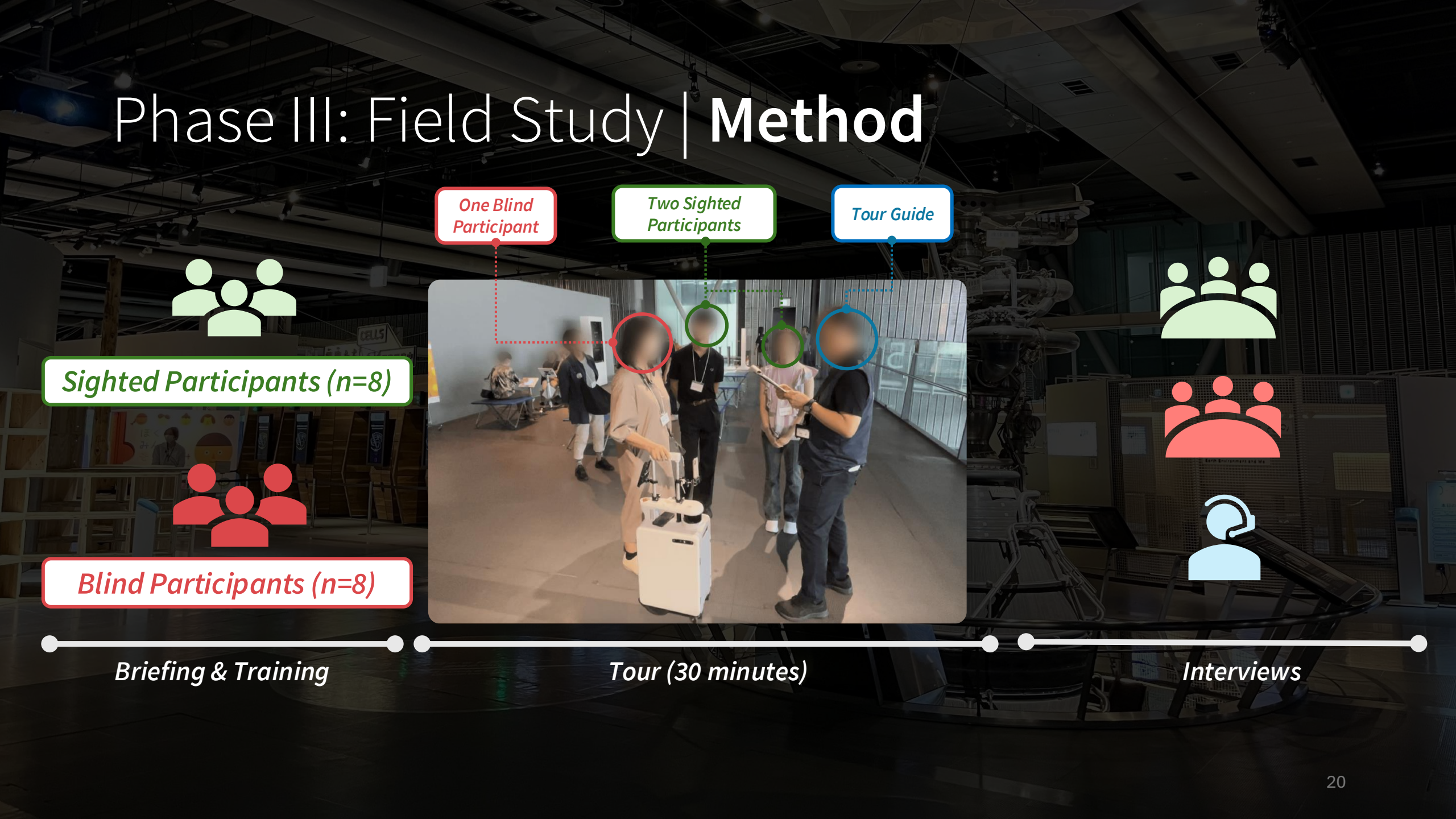

### *5. Navigational Support*

The blind user follows the robot to join the tour (Robot Tele-operation)

# Phase II: System | **Implementation**

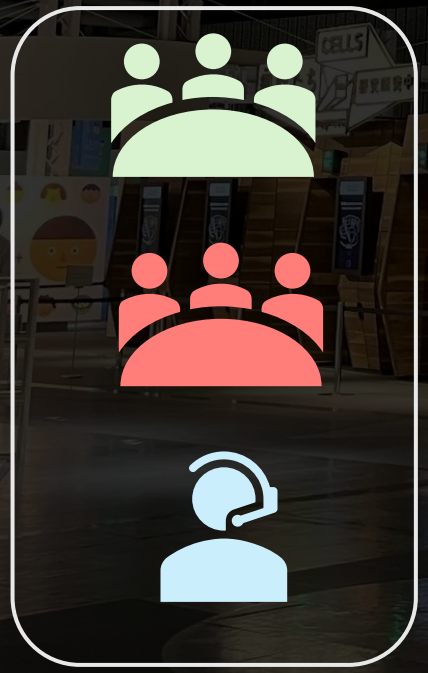


# Phase III: Field Study | **Method**



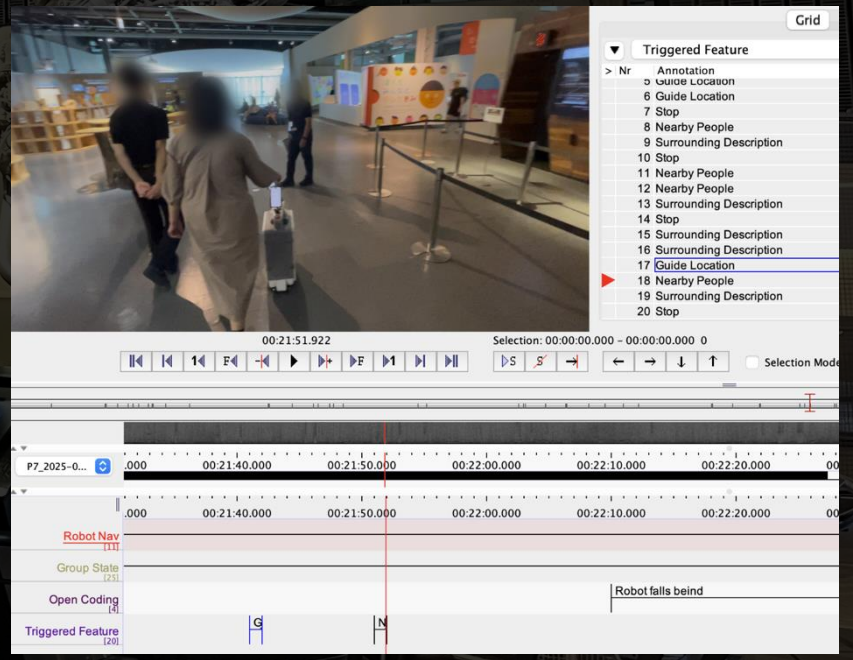
# Phase III: Field Study | **Data Analysis**

*Interview Data*



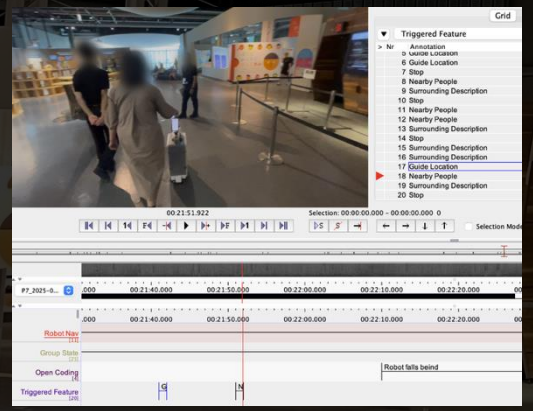
*System Log*

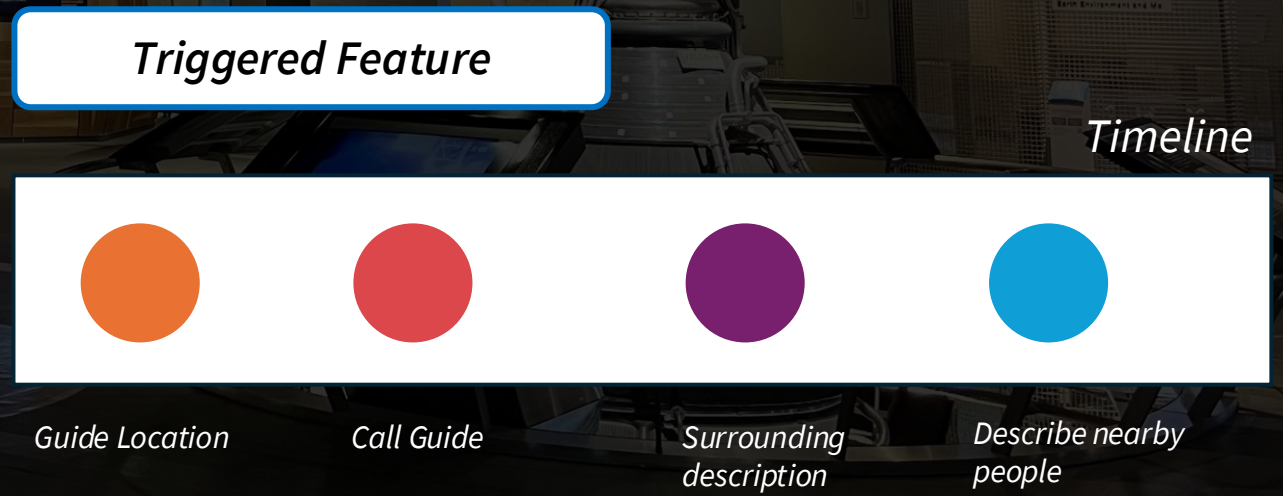
*Tour Video Analysis*



# Phase III: Field Study | **Data Analysis**

***System Log & Tour Video Analysis***



# Phase III: Field Study | **Data Analysis**

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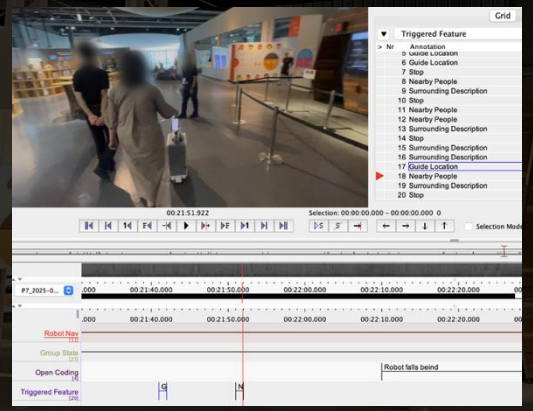
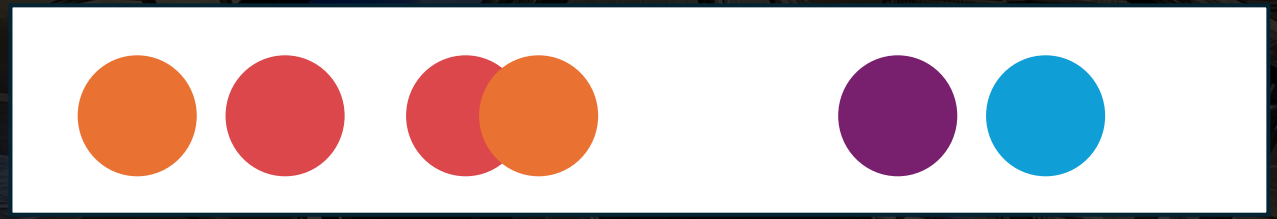


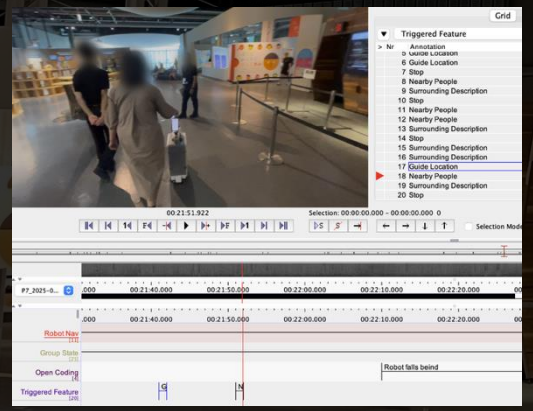

*Triggered Feature*

*Timeline*



# Phase III: Field Study | **Data Analysis**

***System Log & Tour Video Analysis***




***Robot Nav State***

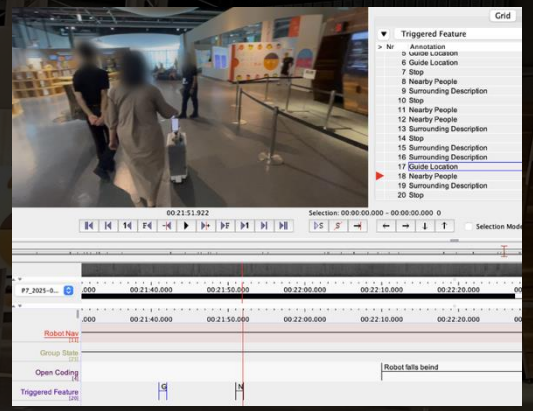
*Timeline*

*Being stuck*

*Following*

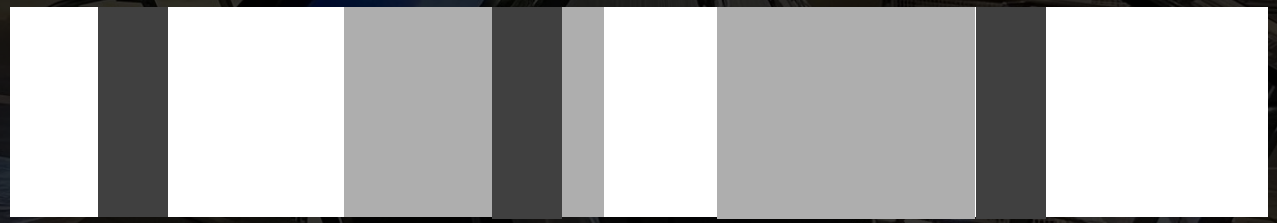
# Phase III: Field Study | **Data Analysis**

***System Log & Tour Video Analysis***




***Robot Nav State***

*Timeline*



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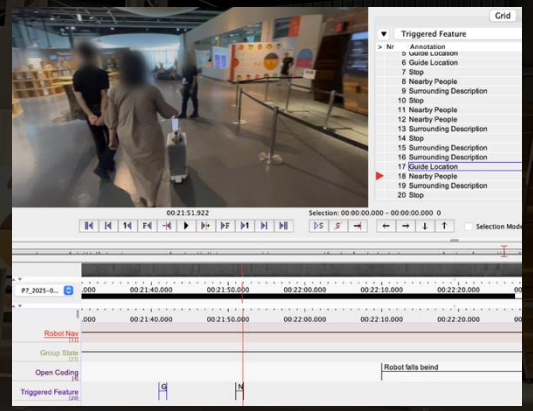


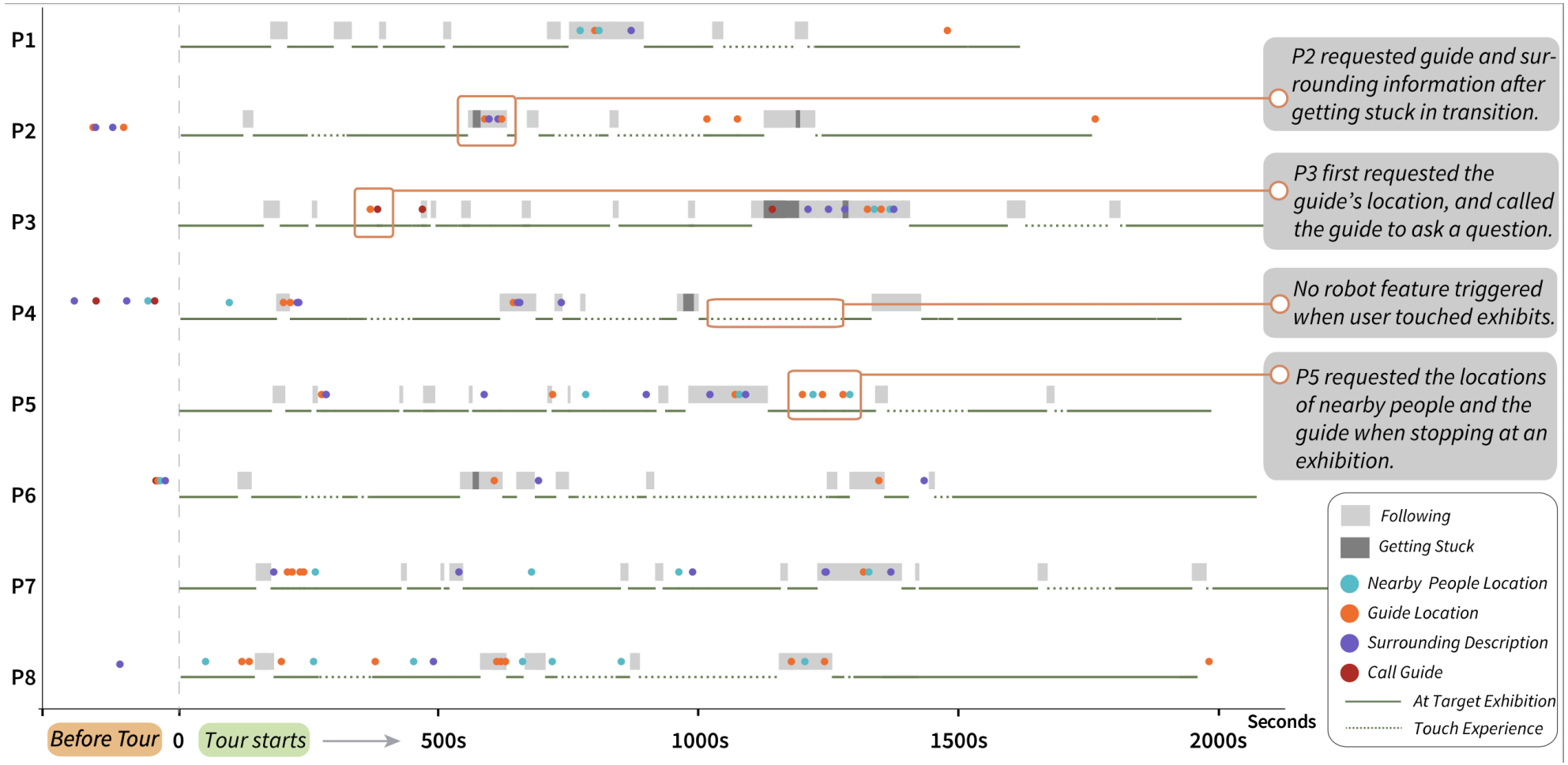

***Group Member State***

*Timeline*

*At the exhibit*

*Touch the exhibit*

# Phase III: Field Study | **Interaction Patterns**



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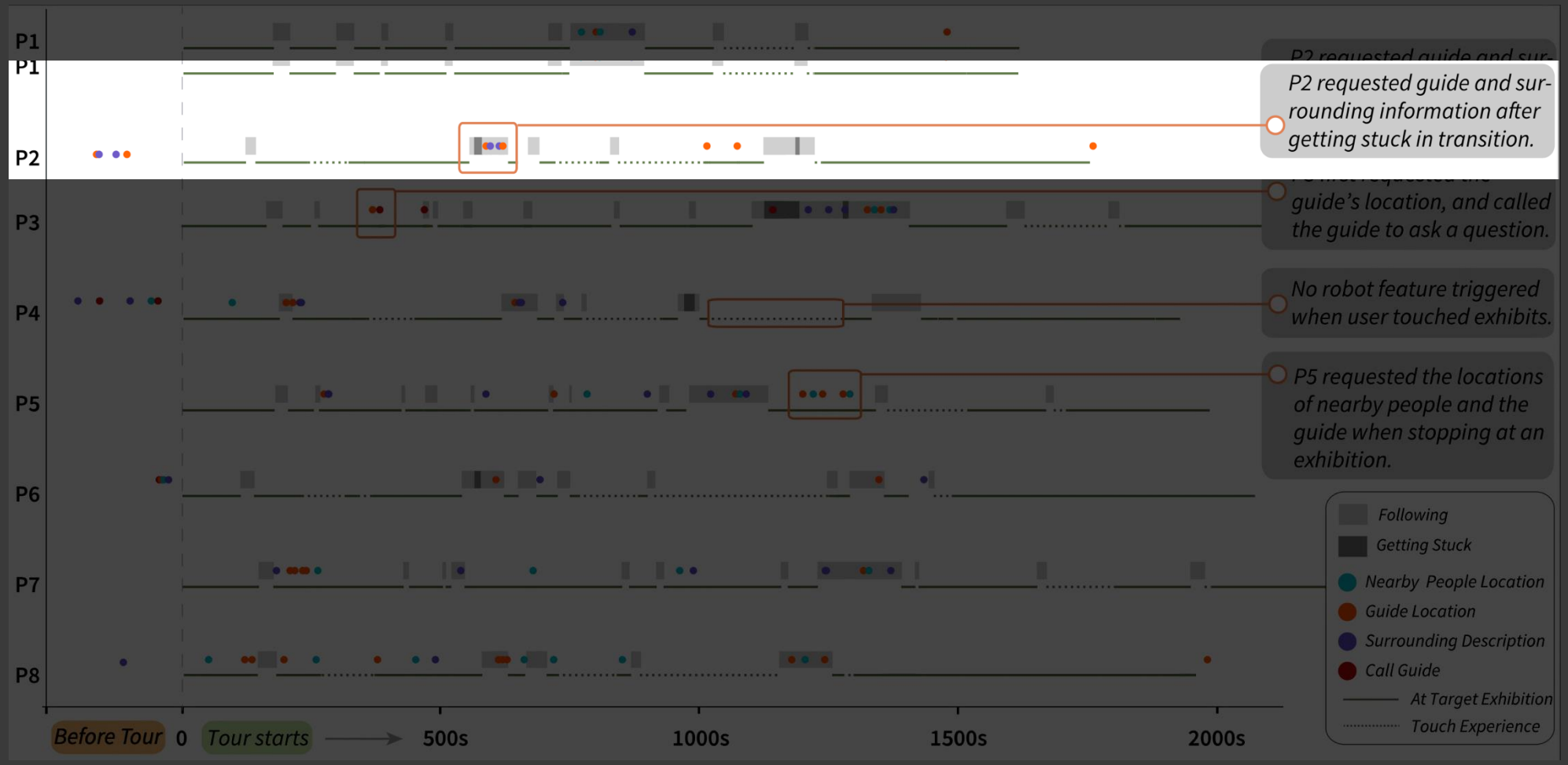

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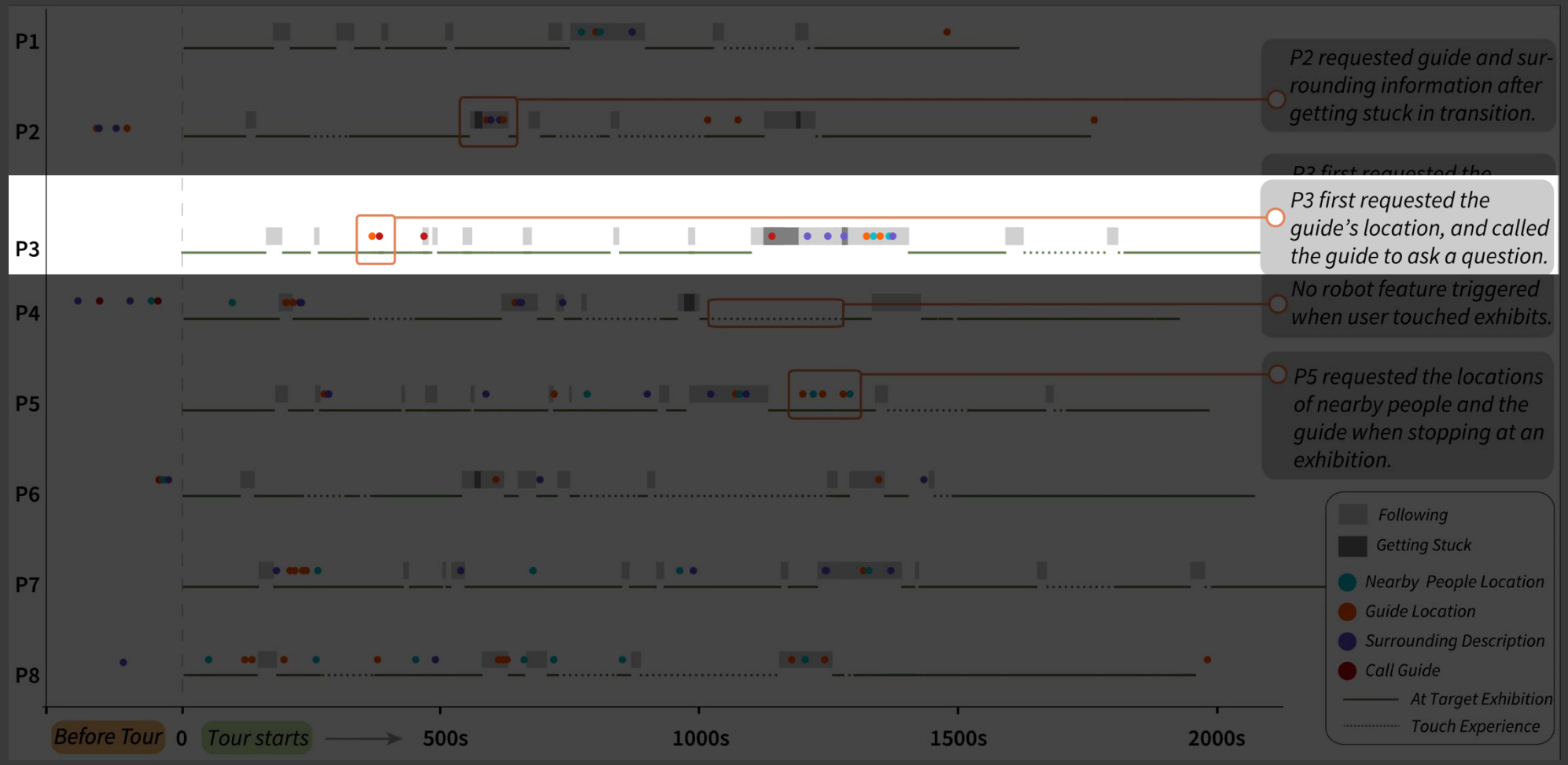

# Phase III: Field Study | **Qualitative Findings**

***Robot-Assisted Group Following***

- Sense of safety in following
- Robot adjustment by the user

***Robot-Assisted Group Interaction***

- Engagement with the tour guide
- Maintain connections with the guide
- Interaction with other visitors
- Heighted self-consciousness

***Sighted Stakeholder Feedback***

- Touch experience for sighted visitors
- Slowed tour pace
- Need of “call guide” and monitoring the robot location

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# Thank you for listening!

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