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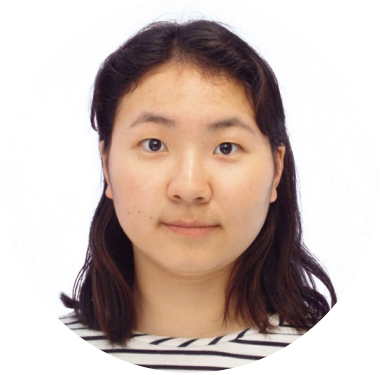
Rethinking the Fashion Show: A personal daily life show using Augmented Reality

Shihui Xu[1], Yuhan Liu[1], Yuzhao Liu[1], Kelvin Cheng[2], Soh Masuko[2], and Jiro Tanaka[1]

[1] Waseda University

[2] Rakuten Institute of Technology

Presenter:
Shihui Xu
shxu@toki.waseda.jp



Shihui Xu

PhD student

Graduate School of Information, Production and systems, Waseda University

shxu@toki.waseda.jp

Research Interests

- Human-computer Interaction
- Augmented Reality

Publications

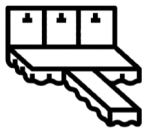
- Shihui Xu, Jingyi Yuan, Xitong Sun, Yuhan Liu, Yuzhao Liu, Kelvin Cheng, Soh Masuko, and Jiro Tanaka, "Augmented Reality Fashion Show Using Personalized 3D Human Models," International Conference on Human-Computer Interaction (HCII), 2020.
- Shihui Xu, Bo Yang, Boyang Liu, Kelvin Cheng, Soh Masuko, and Jiro Tanaka, "Sharing Augmented Reality Experience Between HMD and Non-HMD User," International Conference on Human-Computer Interaction (HCII), 2019.

Fashion Show

- A fashion show is an event to exhibit the clothing designs for consumers.

- Components of a traditional fashion show:

Live model



Runway

Catwalk

Pose

High fashion clothes

Problems

- There are some problems of traditional fashion shows:

1. The consumers cannot **participate** into fashion show and watch themselves.
2. Garments of fashion show **deviate from usual life**.
3. There is a **gap** between the fashion show and daily life of the consumers.

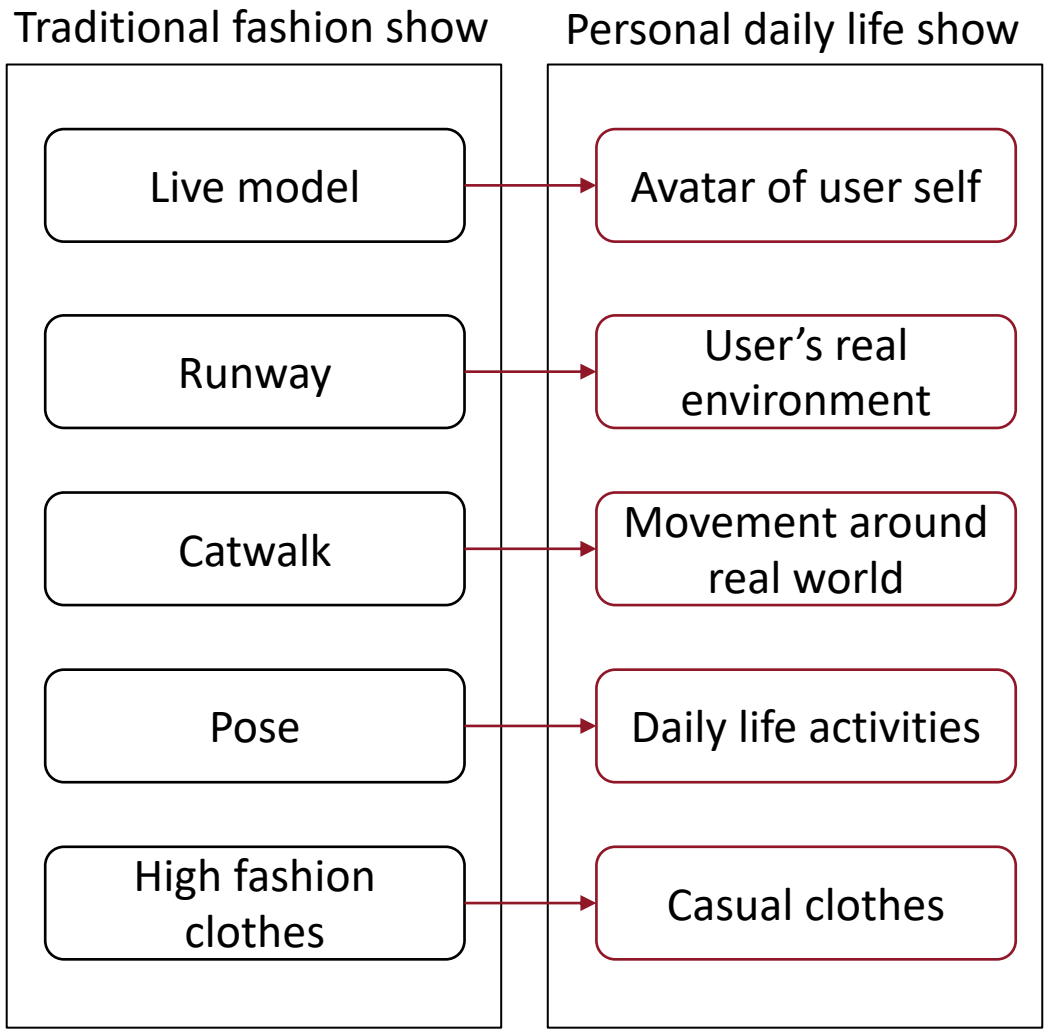
How to make fashion show more effective for **general consumers** ?

Research Goal

- To solve the existing problems, we enable users to have a personal daily life show in their real environment

1. Life-sized personalized 3D avatar of the user self as model.
2. The user can select purchasable clothes from shopping website for fashion show.
3. The personalized avatar can interact with real environment using Augmented Reality (AR) technology.

Traditional Fashion Show vs Personal Daily Life Show



AR Technology in Fashion Industry

- Using AR to narrow down the gap between online and brick-and-mortar shopping experience [1]

  E.g.

  - AR fitting room
  - Magic Mirror

- Using AR to improve the hedonic and utilitarian value of consumer experience [2]

[1] M. Blázquez, "Fashion shopping in multichannel retail: the role of technology in enhancing the customer experience," International Journal of Electronic Commerce, vol 18, pp. 97-116, 2014
[2] A. Javarnik, Y. Rogers, A. Moutinho et al. "Revealing the shopper experience of using a 'Magic Mirror' augmented reality make-up application," Proceedings of the 2016 ACM Conference on Designing Interactive Systems: Fuse, 2016.

Avatar in Fashion Show

- Avatar as fashion model
  - Stephen Gray [3] proposed a VR fashion show in which users can have a virtual model of the same shape as their own bodies.
  - The avatar can be fitted with virtual clothing and walk catwalks in a virtual environment.
  - However, the avatar can only reflect the body shape of the user.

[3] S. Gray, "In virtual fashion," in IEEE Spectrum, vol. 35, no. 2, pp. 18-25, Feb. 1998

Demo

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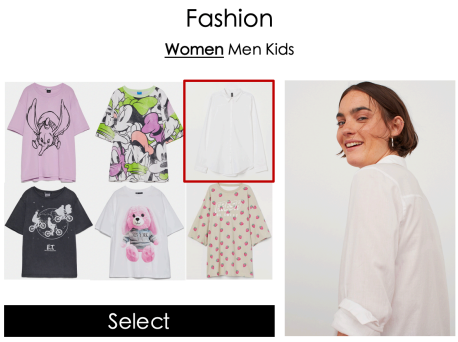
System Pipeline

The images of face and body

Personalized 3D avatar

Personalized avatar fitted with garment

Experience the daily life show of user's personalized avatar using see-through type AR head-mounted display



Select clothes from shopping website

3D garment model

Daily Life Show

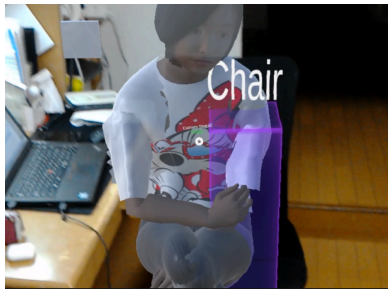
- Movement around real environment.

a) Stand idle

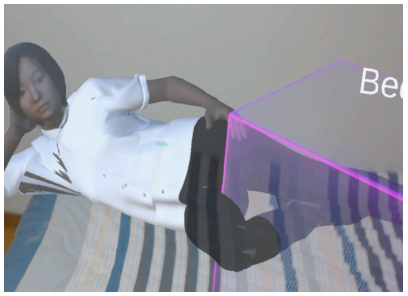
b) Walking

- Interaction with real objects.

a) Sitting on a chair

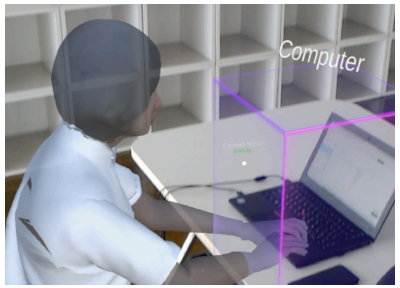


b) Laying on a bed



c) Doing sit-ups on a mat

d) Typing on a computer



Implementation Overview

1

Preparation of dressed personalized avatar

2

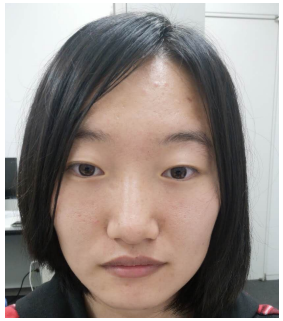
Attaching animation

3

Interaction with real environment

Generation of Personalized Avatar

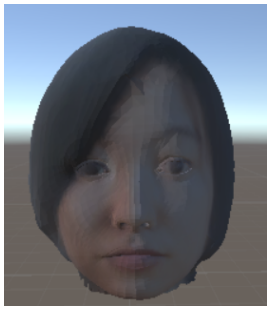
Face image



Face modeling

Avatar SDK

Face model



Body image

Body modeling

3DLOOK

Body model

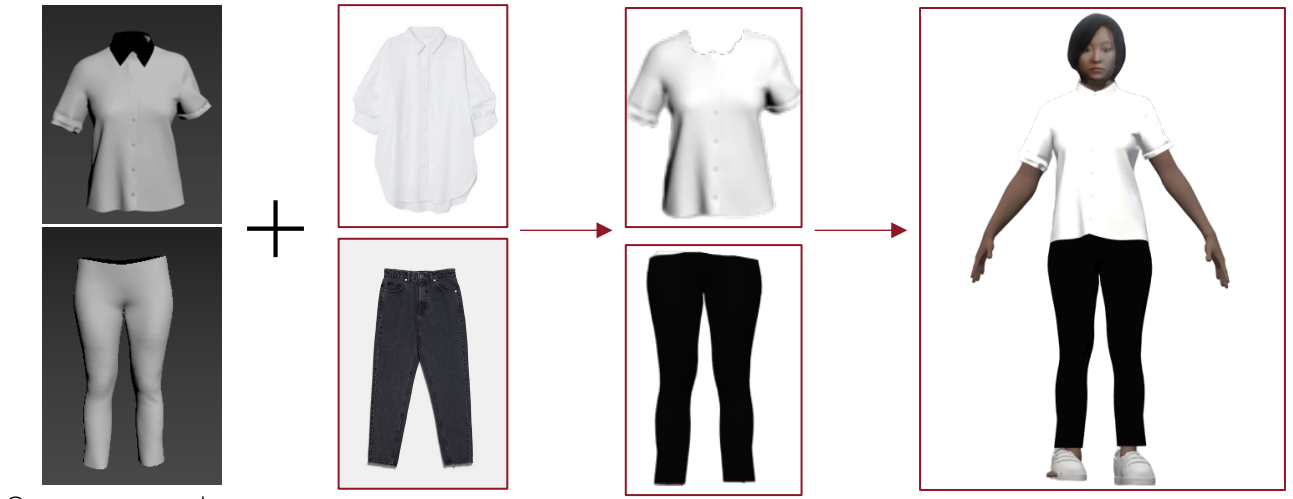
Combination

3ds Max

Personalized avatar

Generation and Fitting of 3D Apparel Model

- Building 3D virtual garment templates for each personalized avatar of the user using Cloth Weaver.
- Gathering clothes images from shopping websites.
- Mapping 2D clothes images to generated 3D virtual garment templates.
- Matching the garment model to personalized avatar of users.



Garment templates

2D images from shopping website

3D virtual garment model

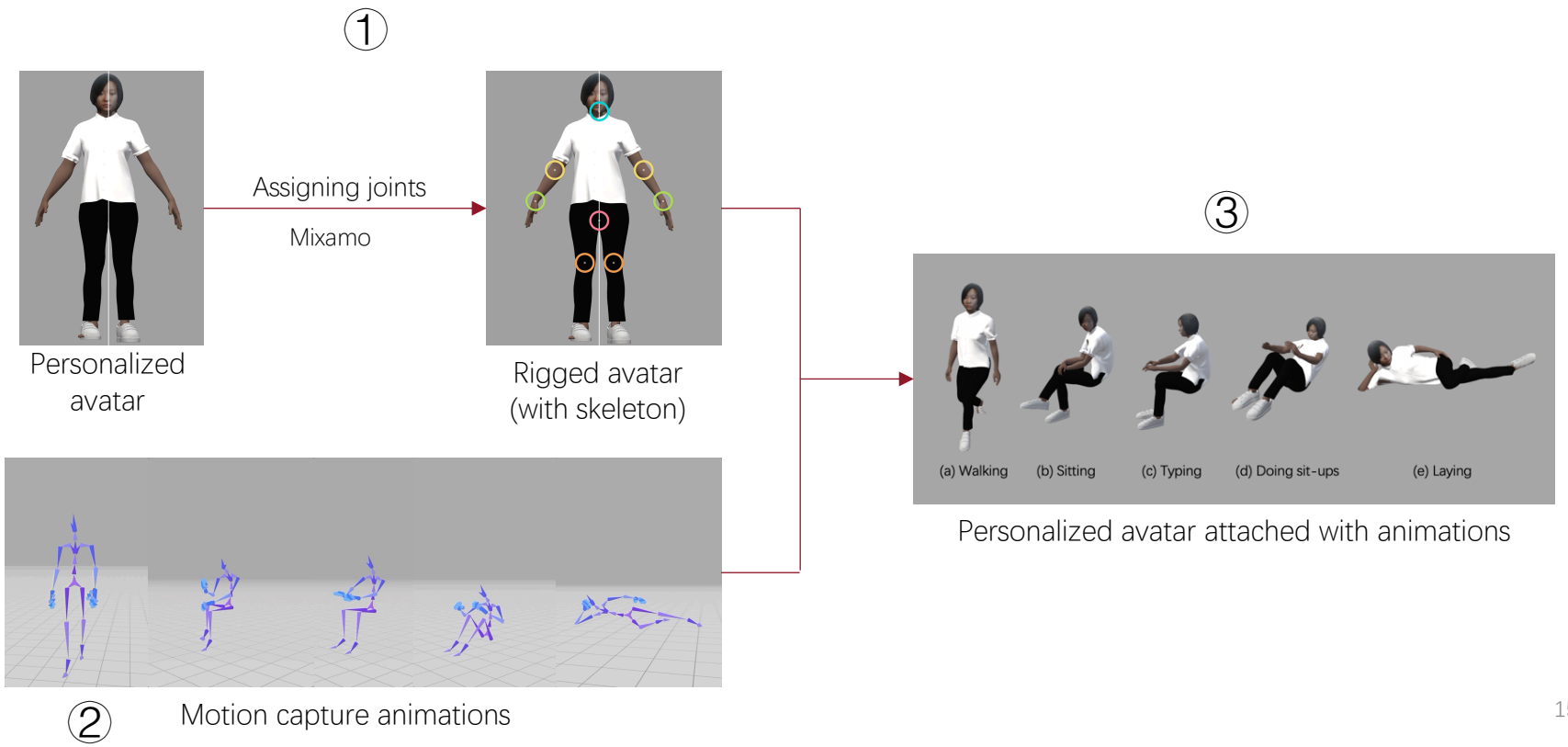
Dressed personalized avatar

Attaching Animations to Personalized Avatar

① Rigging the personalized avatar.

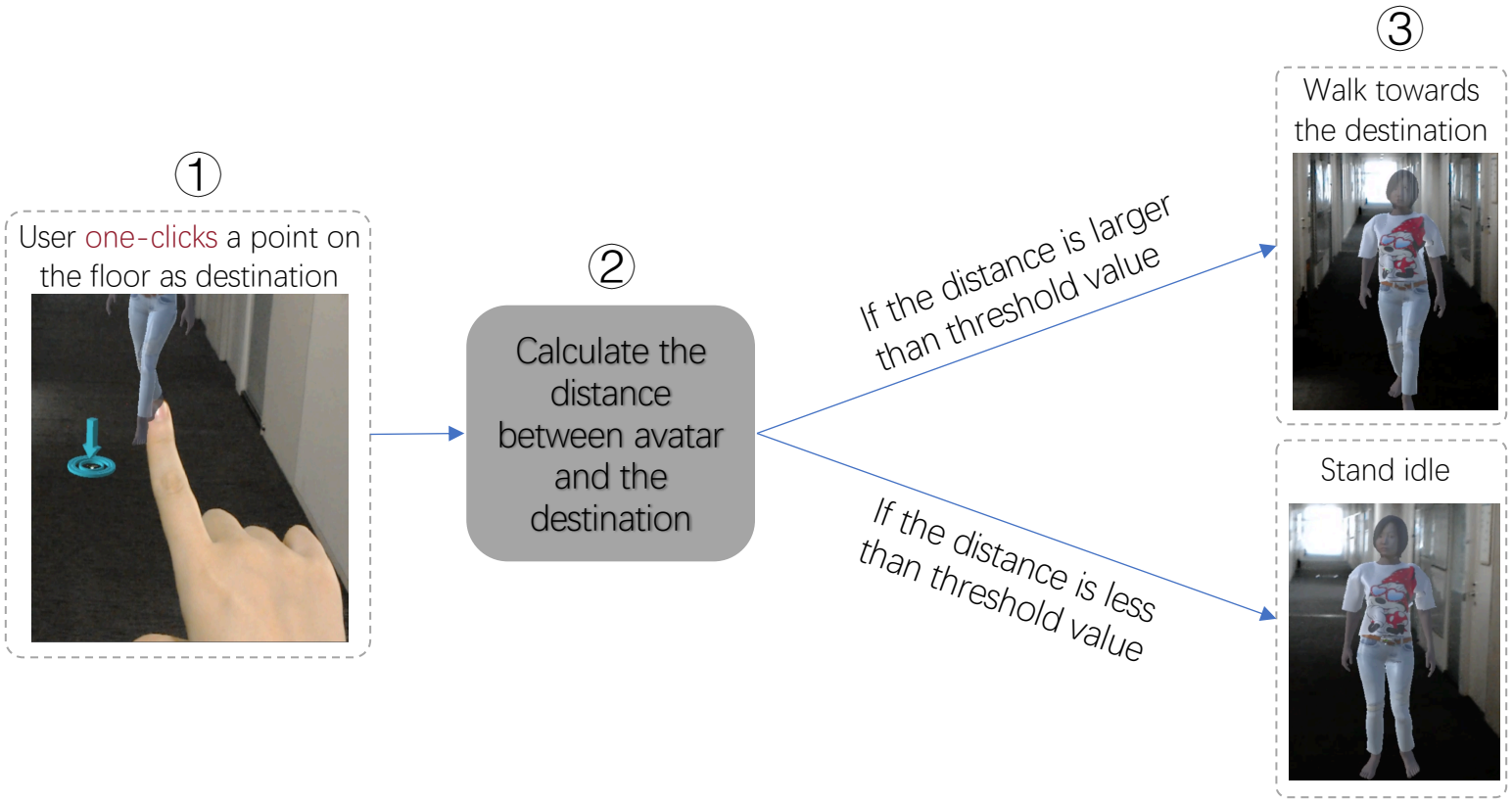
② Preparing motion capture animations.

③ Attaching the motion capture animation to rigged personalized avatar via Unity animator controller.



Movement around Real Environment

① Specifying the destination
② Calculation of distance between avatar and destination
③ Changing position and animation of avatar



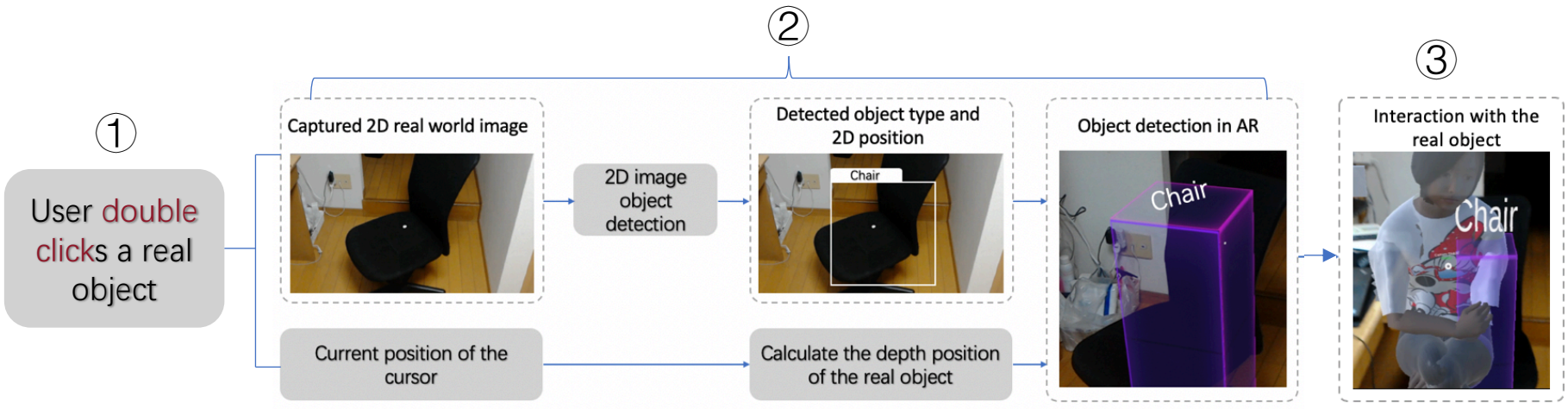
Interaction with Real Objects

① Specifying real object for interaction

② Object detection in the AR environment

- Determine the type of real object by 2D image object detection
- Determine position of real object by calculating position of cursor.

③ Changing animation of avatar according to type of real object



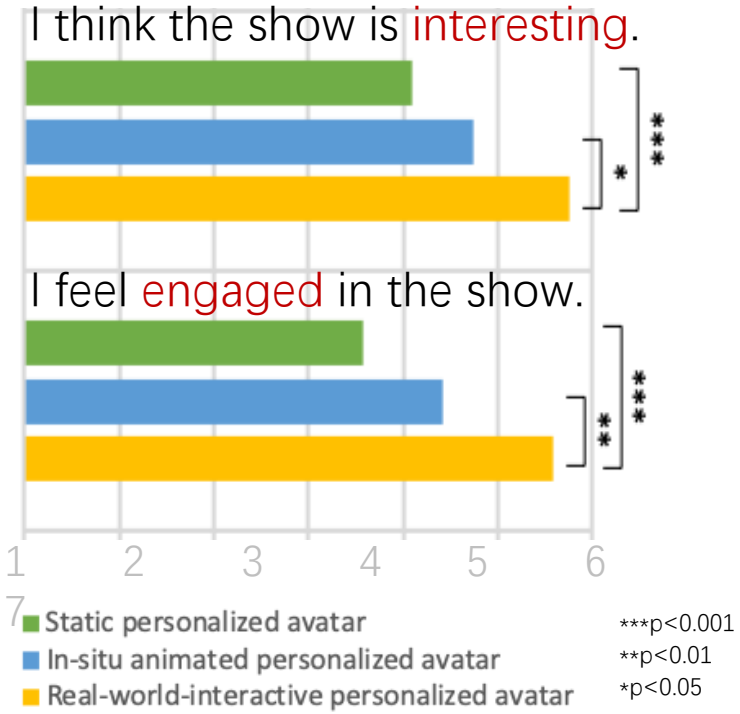
Experimental Design

- We are interested in evaluating the impact of interactivity level of virtual avatar in personal daily life show system.

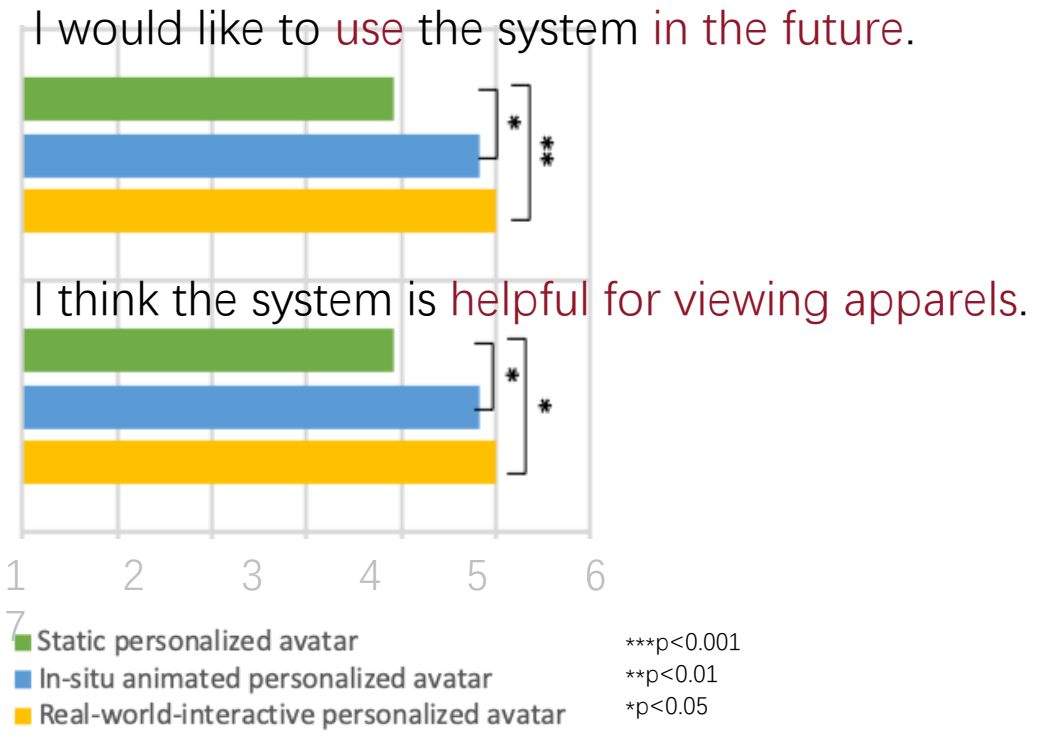
- Interactivity level of personalized avatar
  1. Static personalized avatar
  2. In-situ animated personalized avatar
  3. Real-world-interactive personalized avatar

- 12 participants were recruited.

Result 1: Interest and Engagement



Result 2: Future Use and Helpfulness



Conclusions

- In this paper, we propose a novel fashion show system, personal daily life show, using AR technology.
- It has these features:
  1. Adopting users' personalized avatar as the show model.
  2. Providing virtual 3D apparel models based on 2D apparel images from shopping website.
  3. Enabling user' s personalized avatar to interact with real environment using AR technology.
- Our evaluation showed that the real-world-interaction of personal daily life show had positive effect to the fashion show.

THANKS FOR YOUR ATTENTION

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