AUDIENCE PARTICIPATION GAMES FOR PROMOTING UKIYOE

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As of March 2020, this number had climbed to 1.44 million

https://www.businessofapps.com/data/twitch-statistics/
Audience Participation Games, a livestreaming design concept that allows audiences participate in gameplay via methods like chat messages.
Games With a Purpose (GWAP) is the concept of using games for human to solve problems that computers cannot solve.

Audience Participation Games With a Purpose (APGWAP) is the concept of letting game live streaming audiences help solving problems that computers cannot solve.
https://www.twitch.tv/ch932

Please register for a Twitch account

JUSTIN: Japanese Ukiyo-e Streaming That Improves Narrative
Needs for description

❖ For data analysis, deep learning, building recommender system
❖ For those with visual impairment
<table>
<thead>
<tr>
<th>Expert description</th>
<th>Painting, album leaf. Landscape. Fuji beyond lake and pine clad promontory. Ink and colours on paper.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-expert description</td>
<td>The picture show a beautiful view of a very high mountain along with a wide river. The context looks like, there is mist covering everything, there is one boat in the river.</td>
</tr>
<tr>
<td>Expert description</td>
<td>Woodblock print. Popular culture. Woman with baby, with picture of Kinryuzan Sensoji temple inset.</td>
</tr>
<tr>
<td>Non-expert description</td>
<td>A japanese woman is holding the kid. The woman wears kimono and so is the kid. There is a picture hanging in the room. It looks like they are mother and son.</td>
</tr>
</tbody>
</table>
CONTRIBUTIONS

❖ A new concept: audience participation game with a purpose (APGWAP)
❖ A complete design of APGWAP, which can be of use as a reference for other purposes, and results as well as discussions on description quality and
❖ Player Enjoyment from a conducted full-scale experiment with the proposed APGWAP.
### GAME RULES

1 Game round has 2 Sessions:
- Describing: 80 secs
- Voting: 30 secs

<table>
<thead>
<tr>
<th>Describers</th>
<th>Voters</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Can describe multiple images</td>
<td>• Vote for 1 description in the list of description.</td>
</tr>
<tr>
<td>(1 description / image)</td>
<td></td>
</tr>
<tr>
<td>• Can be a voter in a voting session</td>
<td></td>
</tr>
<tr>
<td>• Cannot vote for descriptions which belong to the image he created descript</td>
<td></td>
</tr>
</tbody>
</table>
DESCRIBING SESSION

Feel free to describe as many images below as you want.

A: A woman with a baby

Please describe them in format: "imageID:description".
E.g. A: There is a group of kids playing on a beach.

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Voting Session

1. A black and white photo of a person wearing a hat
2. A black and white photo of a person
3. A painting of a woman in a green dress
4. A painting of a woman in a green dress
5. A wall with a picture of a man on it
6. A painting on a wall with a painting on it
7. A wife helping her husband dressing
8. A woman riding a goose
9. A woman holding her baby
10. A young man and a young woman
11. A woman ride on a bird
12. The woman is getting friend with benefit
13. A woman wearing a kimono flying on a goose
14. A woman with her child
15. A woman and her child

Please vote for 1 description above in format: "#description_id". E.g. #1

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RESULT OF GAME ROUND

RESULT OF ROUND 16

Winning descriptions for this round are:
15: A woman and her child for image A
7: a wife helping his husband dressing for image B
17: flying duck again1 for image C

Score awarded to players:
7_jh_7 ← 2 aoi_monogatori ← 0 doradoramatsu ← 6 ebinkatsu ← 5 fang2hou ← 2
gosou1104 ← 2 hatakeitchiasu ← 2 icelab2nijuni ← 6 ichimarumaskaw ← 1 june1ejj ← 0
kuralemot ← 5 ligoligo12 ← 1 narutoasaki ← 6 pengold ← 2 sasukeakasi ← 1
touma100 ← 6 uranium410 ← 2

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Some description results from game

From JUSTIN Players

"a woman riding a goose":
    "score":8.39000000000001,
    "used_time":5
),
"A woman wearing a kimono flying on a goose":
    "score":1.8,
    "used_time":2
),
"flying duck again!":
    "score":8.4,
    "used_time":1
)

"a women holding her baby":
    "score":0.5142857142857142,
    "used_time":2
),
"a woman and her child":
    "score":0.6666666666666666,
    "used_time":1
),
"three women is walking":
    "score":0.9411764765882353,
    "used_time":2
),
"man and woman in European clothes":
    "score":2.0,
    "used_time":2
),
"A man and a woman":
    "score":0.6666666666666666,
    "used_time":1
)

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Descriptions by an AI

(Pythia)

- a large group of people standing next to each other
- a group of people standing on top of a beach

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EVALUATION

❖ Description Quality
❖ Player Experience (Enjoyment)
EVALUATION 1: Description Quality

3 Stage

1. describing
   - 24 participants → 4 equal groups each group describe 5 images

2. voting
   - 19 participants → select the best description

3. evaluation
   - 24 participants → … (next slide)
EVALUATION 1: Description Quality

3. evaluation

❖ For each image → Shown with 4 other similar images
Let each participant choose based on a given clue

3 Conditions: Keywords vs Non-expert Descriptions vs Expert Descriptions

❖ 24 participants → 2 Equal Group
Each group answers 10 questions of each condition

From previous stage, we got 20 Image + Best Desc.

correctness & sufficiency

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**Keywords**

11. Please select the best image for this keyword: "myth/legend, history"

**Non-expert Descriptions**

17. Please select the best image for this description:
"two woman are in the pictures, one of them is sitting and still fixing her appearance while looking in the hand mirror. The other one is standing and talking to the sitting one."

**Expert Descriptions**

25. Please select the best image for this description:
"Colour woodblock oban triptych print. Travellers at Enoshima: Collection of elegantly dressed pilgrim travellers waiting at tea-stall at Katase Beach; seven women and one young man taking off hat, fanning breast, wiping perspiration, smoking pipe and re-tying sandal; more tourists watching boys swimming and looking across towards island; snow-capped Mt Fuji in distance. Signed, marked and inscribed."
### EVALUATION 1: Description Quality

<table>
<thead>
<tr>
<th>Keywords</th>
<th>Non-expert Descriptions</th>
<th>Expert Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correctness</td>
<td>50.7%</td>
<td>92.9%</td>
</tr>
</tbody>
</table>

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EVALUATION 2: Player Experience

❖ Questionnaire: Game User Experience Satisfaction Scale (GUESS)

❖ 1st PX Experiment:
  • 25 participants, Ritsumeikan University Student, 18 min
  • most of the images to be randomly displayed at least three time
    (to evaluate the reward and penalty mechanisms)

❖ 2nd PX Experiment:
  • 21 participants, Bangkok University Student, ~20 min
  • increasing the voting time, added background music, etc.
    and we have publicized the game online

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# EVALUATION 2: Player Experience

- **GUESS**
  - Game
  - User
  - Experience
  - Satisfaction
  - Scale

## TABLE 1

<table>
<thead>
<tr>
<th>Factors</th>
<th>Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I think it is easy to learn how to play the game.</td>
</tr>
<tr>
<td>1</td>
<td>I find the controls of the game to be straightforward.</td>
</tr>
<tr>
<td>3</td>
<td>I feel detached from the outside world while playing the game.</td>
</tr>
<tr>
<td>3</td>
<td>I do not care to check events that are happening in the real world during the game.</td>
</tr>
<tr>
<td>4</td>
<td>I think the game is fun.</td>
</tr>
<tr>
<td>4</td>
<td>I enjoy playing the game.</td>
</tr>
<tr>
<td>5</td>
<td>I feel the game allows me to be imaginative</td>
</tr>
<tr>
<td>5</td>
<td>I feel creative while playing the game.</td>
</tr>
<tr>
<td>7</td>
<td>I am in suspense about whether I will succeed in the game.</td>
</tr>
<tr>
<td>7</td>
<td>I feel successful when I overcome the obstacles in the game.</td>
</tr>
<tr>
<td>8</td>
<td>I find the game supports social interaction (e.g., chat) between players.</td>
</tr>
<tr>
<td>8</td>
<td>I like to play this game with other players.</td>
</tr>
<tr>
<td>9</td>
<td>I enjoy the game's graphics.</td>
</tr>
<tr>
<td>9</td>
<td>I think the graphics of the game fit the mood or style of the game.</td>
</tr>
</tbody>
</table>


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EVALUATION 2: Player Experience

Fig. 4. Result of each satisfaction factor on JUSTIN game in the first control experiment and the second control experiment after publicizing...
CONCLUSION

• JUSTIN, the first Audience Participation Games With a Purpose (APGWAP) for collecting Ukiyo-e descriptions, to be used in future systems.
• APGWAP can be effective in humanities research
• Non-expert description can be helpful.
• The system provides good gameplay experience.

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FUTURE WORK

Comments from the 2nd PX Experiment:

- Support more languages such as Japanese, Thai
- Add functions to the chat bot to make it more interactive.
  - For example, do cheering after players win or create or vote a description to encourage them
- Improve graphics by using Unity to develop the game
- Add auto words correction so when players type wrong word or have typos, the system to automatically correct itself.

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