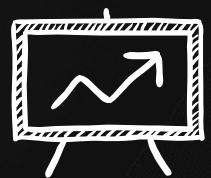


# INTERFACE DESIGN FOR HCI CLASSROOM: FROM LEARNERS' PERSPECTIVE



# Interface Design for HCI Classroom: From Learners' Perspective

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15<sup>th</sup> International Symposium on Visual Computing



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**OUTLINE**

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1. Motivation
2. Methodology
3. Results
4. Conclusion

1.

# MOTIVATION

Why explore the perspective of learners?

- In teaching: Design principles, processes, guidelines
  - HCI Curriculum by ACM SIGCHI [1]
  - Creating a good interaction design in classrooms [2]
- From instructors' perspective
- **How about learners'?**

## • HOW, and TO WHAT EXTENT students perceive the design principles?

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- Understanding learners' perspective is beneficial for:
    - **Instructors:** reorganize teaching materials and methods so to boost learning performance
    - **Learners:** having their point of view to justify or being justified to develop the critical thinking skills
- Essential indicator to reshape the perceptual thinking on how HCI is being taught and learned

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**HOW, and TO WHAT EXTENT students  
perceive the design principles?**

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- R1.** Given a set of design principles/guidelines, to what extents students follow them?
- R2.** Which part of the HCI design the learners focus on?
- R3.** Do they have the same perspectives on adopting the design principles and are these views consistent?

2.

# METHODOLOGY

Materials and Approaches

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## • TEACHING METHOD AND ACTIVITIES •

- Studio-based learning
- Students actively involved in one assignment and two projects
- In each assignment/projects both instructors and students were engaged for evaluations
- Students reflect their learning for justifying their peers

# ASSESSMENT TOOL

**A) Instructor's view: List of presentations**

**B) Presenter's view**

**C) Audience's view.**

**Presentation list**

ID	Name	Image	Sketch	Screenshot	Presentation	Github	
1	Lucie Feiley, Lynn Regan, Poppy Wagstaff				<a href="https://humancomputerinteraction.github.io/presentation/">https://humancomputerinteraction.github.io/presentation/</a>	<a href="https://github.com/humancomputerinteraction/presentation/">https://github.com/humancomputerinteraction/presentation/</a>	<button>Start</button>
2	Kate Canny, Betty Canny, Tarahila Francis, Esme Rose Irving				<a href="https://humancomputerinteraction.github.io/presentation/">https://humancomputerinteraction.github.io/presentation/</a>	<a href="https://github.com/humancomputerinteraction/presentation/">https://github.com/humancomputerinteraction/presentation/</a>	<button>Start</button>
3	Serina Guerra, Eren Amatrade, Melody Baskey, Cailey Chancz				<a href="http://www.example.com/index.html">http://www.example.com/index.html</a>	<a href="http://www.example.com/index.html">http://www.example.com/index.html</a>	<button>Start</button>
4	Promissse Kaufman, Jordy Oudejans, Dorian, Zofia King				<a href="http://www.example.com/index.html">http://www.example.com/index.html</a>	<a href="http://www.example.com/index.html">http://www.example.com/index.html</a>	<button>Start</button>
	Braken Vaughan, Marisol Fernandez, Blaise Darden				<a href="https://humancomputerinteraction.github.io/presentation/">https://humancomputerinteraction.github.io/presentation/</a>	<a href="https://github.com/humancomputerinteraction/presentation/">https://github.com/humancomputerinteraction/presentation/</a>	<button>Start</button>

**Current group: #5**      **Time left: 150s**

**Current State of Room**

Your ID:  ID:

1. Does the project follow the golden rules and principles in lecture 2, 3, and 4?  
 1  2  3  4  5  6  7  8  9  10

2. Usability of the interface  
 1  2  3  4  5  6  7  8  9  10

3. Visual appealing  
 1  2  3  4  5  6  7  8  9  10

4. Interactivity  
 1  2  3  4  5  6  7  8  9  10

5. Sound effects  
 1  2  3  4  5  6  7  8  9  10

Comment (optional)  
 It is amazing how you got a VR game to work. It seems to look pretty cool.

**Submit**

3.

# RESULTS

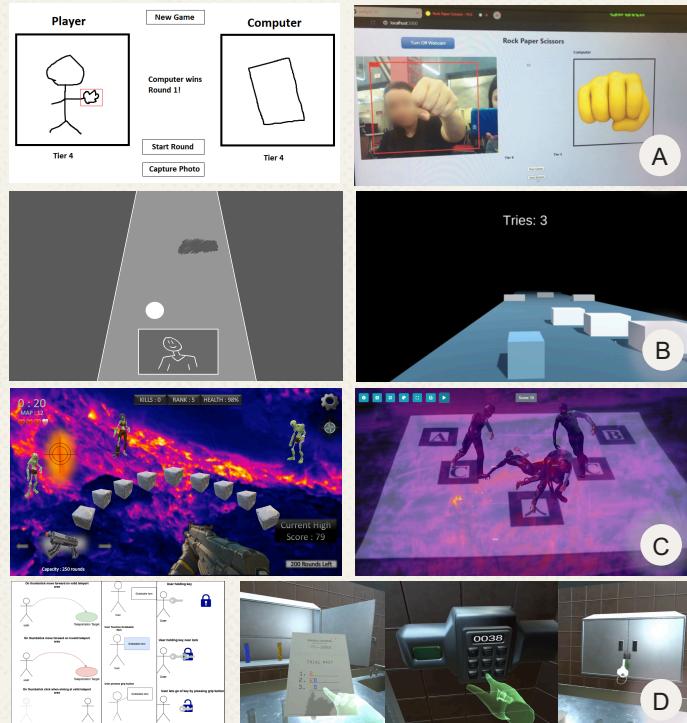
Answering the Research Questions

## Selected Work on Interface Design

Variety of applications:

- A. Object Detection
- B. Web-based 3D application
- C. Virtual Reality (VR)
- D. Augmented Reality (AR)

The study of 83 graduate/undergraduate students for 16 weeks.



## R1: Given a set of design

- principles/guidelines, to what extents
- students follow them?

### Visual Design

Lowest mean (8.20) - highest standard deviation (1.48)

→ Variation visual cognitive styles

**Golden Rules**, from Project 1 to 2:

Mean increased, standard deviation decreased

→ More agreement among students

**Sounds**, introduced in Project 2

Lowest mean (7.33) - highest standard deviation (2.30)

→ Difficulty in incorporating sounds feature

Criteria	Mean	Standard deviation
Project 1		
Golden Rules	8.39	1.30
Efforts	8.90	1.23
Interactivity	8.56	1.27
Usability	8.45	1.31
Visual Design	8.20	1.48
Project 2		
Golden Rules	8.52	1.12
Efforts	8.78	1.24
Interactivity	8.60	1.23
Usability	8.54	1.17
Visual Design	8.30	1.36
Sounds	7.33	2.30

Indication among the students that reflects the overall level of guideline compliance

## R2: Which part of the HCI design the learners focus on?



Wordcloud constructed from students' comments about the design for project 1.

This is the top 150 most common words used, distributed in three categories: UI, UX, and Implementation.

## R2: Which part of the HCI design the learners focus on?

**General:** mirror (72), design (40),  
interface (33)



## R2: Which part of the HCI design the learners focus on?

**General:** mirror (72), design (40), interface (33)

**Service:** widget (34), feature (23)



## R2: Which part of the HCI design the learners focus on?

**General:** mirror (72), design (40),  
interface (33)

**Service:** widget (34), feature (23)

**Visual components:** color (24),  
text (20), button (19)



## R2: Which part of the HCI design the learners focus on?

**General:** mirror (72), design (40),  
interface (33)

**Service:** widget (34), feature (23)

## **Visual components:** color (24), text (20), button (19)

**Common pitfall:** cluttered (16),  
consistent (16)



## R2: Which part of the HCI design the learners focus on?

## User Experience (UX):

understandable (4), helpful (2)

Positive: appealing (8), love (5), amazing(5), impressive (4)

Negative: hard (15), distracting (5), difficult (3), confusing (2)

“HCI is the forerunner to UX design” [3]

→ Suggestion to integrating UX subjects in the HCI curriculum.



## R2: Which part of the HCI design the learners focus on?

## Implementation:

data (10), functionality (9),  
implementation (8), api/API (6),  
function (5), coding (2)

→ Concerns in implementation:  
actualization of the design



### R3: Do they have the same perspectives

- on adopting the design principles and •  
are these views consistent?

Students tend to give the same score (agreement score = 0.963) given the principle guideline/golden rules in project 1, so as in project 2 (agreement score = 0.922).

High consistency (>0.75) in efforts, interactivity, usability, and visual design

Subjects	Raters	Type	Agreement	Consistency	ICC scale [5]
Project 1					
19	77	Golden Rules	0.963	0.972	excellent
19	77	Efforts	0.900	0.970	excellent
19	77	Interactivity	0.955	0.962	excellent
19	77	Usability	0.965	0.972	excellent
19	77	Visual Design	0.971	0.977	excellent
Project 2					
21	75	Golden Rules	0.922	0.947	excellent
21	75	Efforts	0.932	0.952	excellent
21	75	Interactivity	0.896	0.923	excellent
21	75	Usability	0.879	0.886	excellent
21	75	Visual Design	0.964	0.971	excellent
21	75	Sounds	0.970	0.977	excellent

Inter-rater agreement measures for project 1 and project 2: Level of agreement and consistency when students evaluate their peers.

4.

# CONCLUSION

Takeaways

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## CONCLUSION

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- Students emphasized **design feature → visual components → interactivity**
- Design guidelines are followed by a large margin
  - **High level of agreement**, determined by inter-rater agreement measures.
  - **High consistency** within the class regarding other aspects such as efforts, interactivity, usability, and visually appealing.
- **Standalone presentation and feedback platform** is developed to gather instant online peer feedback from students

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## REFERENCES

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- [1] Hewett, T.T., Baecker, R., Card, S., Carey, T., Gasen, J., Mantei, M., Perlman, G., Strong, G., Verplank, W.: ACM SIGCHI curricula for human-computer interaction. ACM (1992)
- [2] Churchill, E.F., Bowser, A., Preece, J.: Teaching and learning human-computer interaction: past, present, and future. *interactions* 20(2), 44–53 (2013)
- [3] Interaction Design Foundation: What is Human-Computer Interac- tion (HCI)?  
<https://www.interaction-design.org/literature/topics/human-computer-interaction> (2019), last accessed on July 1, 2020



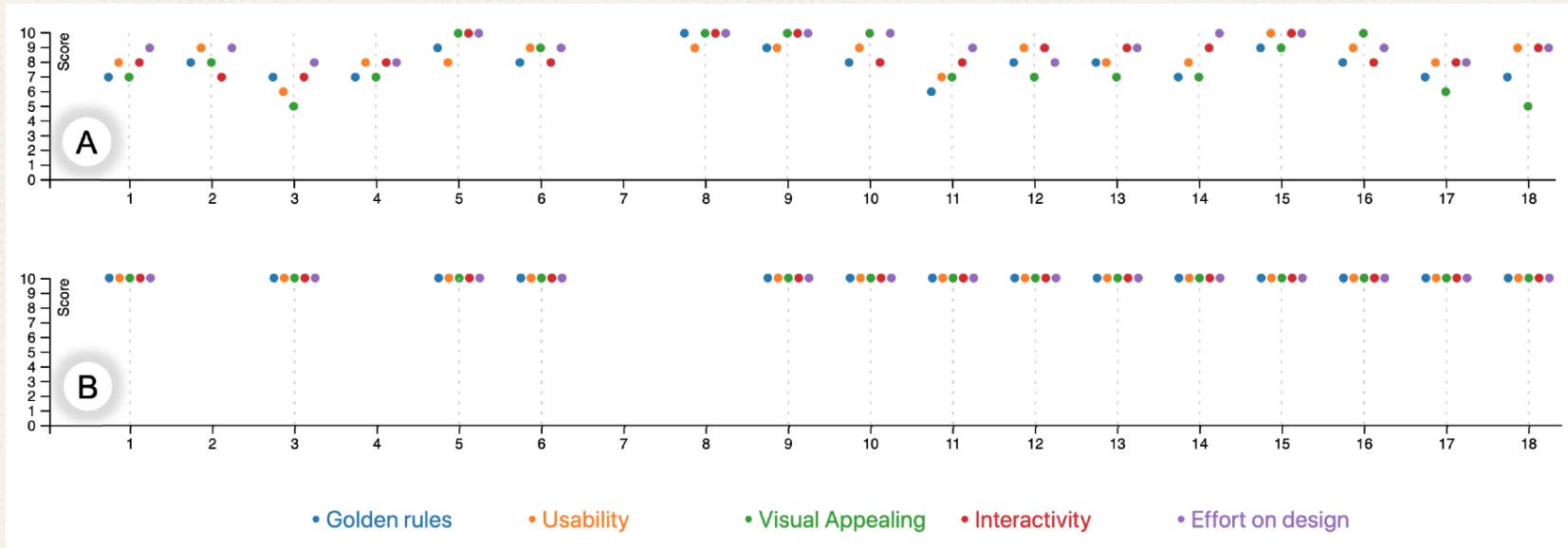
THANKS!

Any questions?

You can find me at [huyen-nguyen.github.io](https://huyen-nguyen.github.io)

Email: [huyen.nguyen@ttu.edu](mailto:huyen.nguyen@ttu.edu)

## GRADING PATTERN



Examples of good (panel A) and inadequate (panel B) peer grading for 18 students.  
Each dot represents grade (from 1 to 10), corresponds to five criteria above.