Grace Yu-Chun Yen

Research Overview (selected projects)

PhD Candidate|Department of Computer Science
University of Illinois Urbana-Champaign

EDUCATION

2013- PRESENT	PhD in Computer Science, HCI Group University of Illinois at Urbana-Champaign
2009- 2011	M.S. in Computer Science, Intelligent Robot Lab National Taiwan University
2005- 2009	B.S. in Computer Science, National Taiwan Normal University

WORK EXPERIENCE

2013- PRESENT	UIUC, Doctoral Graduate Researcher
2019 Summer	Adobe Inc. HCI Research Intern
2018 Summer	Adobe Inc. HCI Research Intern
2011-2013	National Science Council, Software Engineer

Honor and Award

2020	Special Recognition of Outstanding Reviewer, *ACM CSCW2020*
2019	Dissertation Completion Award, *College of Engineer, UIUC*
2017	Grace Hopper Conference Grant
2013	Muroga Endowed Fellowship*, UIUC*
2011	The Best Master's Thesis Award, *Taiwanese Association for Artificial Intelligence*
2009	Outstanding Undergraduate Research Proposal, *NSC (Taiwan)*
2005-2009	Distinguished Undergraduate Scholarship, *NTNU, Taiwan*

GitHub

Google Scholar

Personal Website

MENTORING/TEACHING

PURE Undergraduate Research Program

UIUC CS Graduate Ambassador

CS 565 Human-Computer Interaction

CS 465 User-Interface Design

RESEARCH METHODS

Qualitative Methods
- Interview
- Survey design
- Field study
- Iterative prototyping
- Thematic coding
- Literature Review

Quantitative Methods
- Statistical testing
- Behavior analysis
- Machine learning

PROGRAMMING

Python, R, MySQL, Javascript, JAVA

Sketching Tool

Balsamiq, Adobe XD, HTML/CSS

Table of Content

Dissertation | **Design thinking tools for creative practitioners**

- Interpreting feedback from multiple stakeholders
- Effective Feedback Acquisition in Online Spaces
- Integrating Reflection for Iterative Design
- Design for tracking revision process (Skip)

Master Thesis | **Human-centric and situation-aware pervasive healthcare system in the hospital for elderly People**

Dissertation Research

Design Thinking Tools for Creative Practitioners

Address problems and opportunities triggered by the user of software tools for design thinking

Source: https://medium.theuxblog.com/the-thing-about-design-critiques-fc498a058245

Interpreting feedback from multiple stakeholders

Getting feedback from diverse audience
is critical for creative work

…because people with different backgrounds
and expertise may perceive the same work
differently

However, **interpreting** feedback that differs in *structures*, providers various *topics*, and *contradicts* each other is hard

Research Overview

Stage 1

Semi-structured Interview
Identify the common strategies and criteria experts employed for managing feedback from multiple providers

Stage 2

Prototyping / System Development
Designing Decipher, an interactive feedback tool that embodies expert strategies identified from formative study

Stage 3

Moderated Usability Testing
Evaluate Decipher using a controlled experiment (within-subjects study)

Stage 4

Writing Report (Accepted in ACM CHI2020)

Stage 1: Semi-structured Interview (N=10)

Participants
- Creative Director (N=3), UX designer (N=4), Full-time freelancers in design (N=3)
- All participants receive design feedback regularly as part of their job

Interview Setup
Four in-person and six remote interview
through video conferencing tools
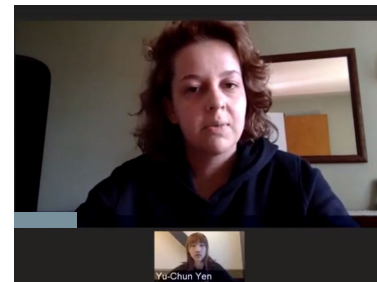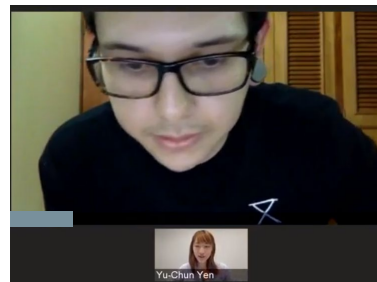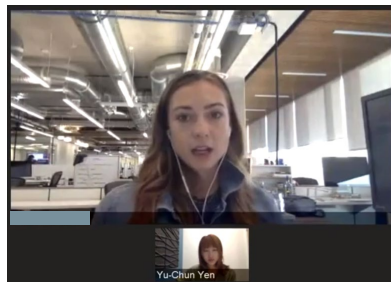
Interview Protocol

Part 1: Interview

- Describe a recent experience for which you received feedback on a design project from more than one person.
- How do you manage/organize the feedback you received?
- How do you decide where to start?
- How do you resolve contradictions between feedback providers?
- How has your method of feedback interpretation changed over time?

Part 2: Think-aloud feedback interpretation task

- Given a flyer and a feedback document, the designers demonstrated how they would annotate and organize the feedback to devise a revision plan for that flyer

Qualitative Data Analysis

Iterative open coding approach
- Observations of the participant behavior
- Interview scripts (using Rev.com)

Discover **three strategies** for processing feedback written by multiple providers

Identify **three criteria** for organizing feedback sets
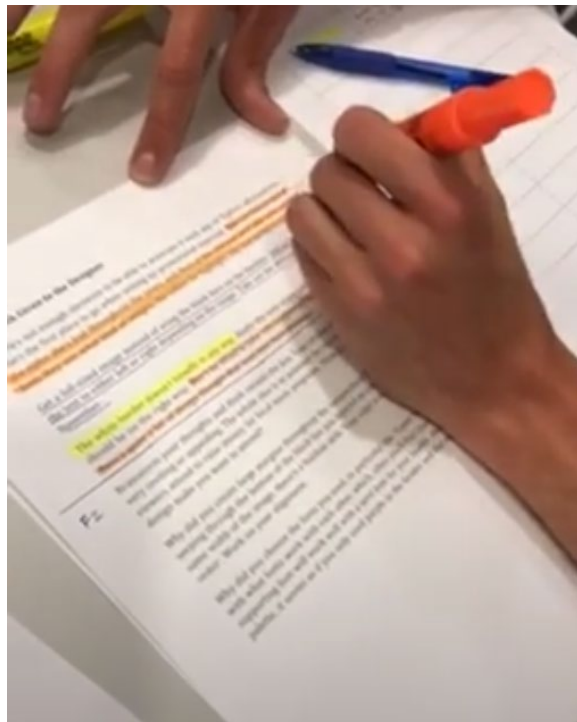
Strategy 1: Identify valuable feedback

" The criteria is usually, is this person giving the feedback that he or she is qualified to give? Like I don't really care if a technical advisor doesn't like the color of something." "

- P1, Female, Creative Director

Strategy 2: Categorizing feedback

" The way we have been organizing feedback is on a spreadsheet so that we can put the people that we're communicating with on one column, and then the questions we're asking in rows above so that you can go through each question and say, like, the majority of the people felt this way, and summarize things at the bottom, and so that's been really useful. "

- P5, Female, UX Designer

Strategy 3: Prioritize action items

" There's the issue of how heavy the feedback is. Is that feedback appropriate for where we are in the process? For example, if it's something that's going to change the whole fabric of the project, I will see where in the timeline is this happening.. "

- P3, Female, UX Designer

Strategies for Organizing Feedback

(a) Sentiment Highlight

(b) Topic Highlight

(c) Recordings of intended actions
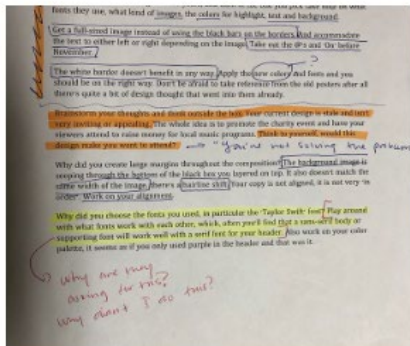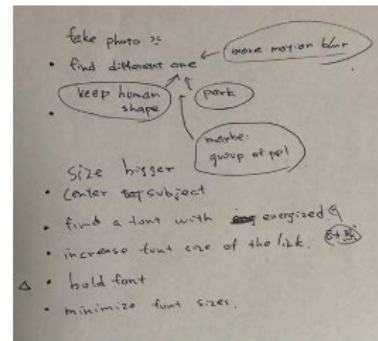

(d) paper highlights

(e) annotation description

(f) a summary view

System Implementation

HTML/CSS, Python Django

jQuery, PostgreSQL

DECIPHER

Paper Prototype

Sketching Tools

Adobe XD, Balsamiq
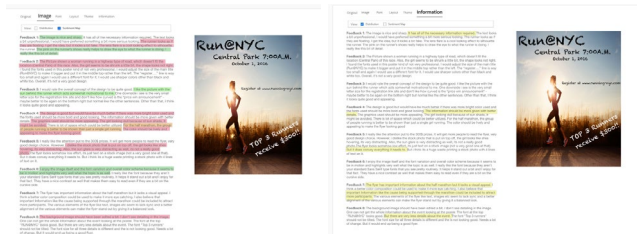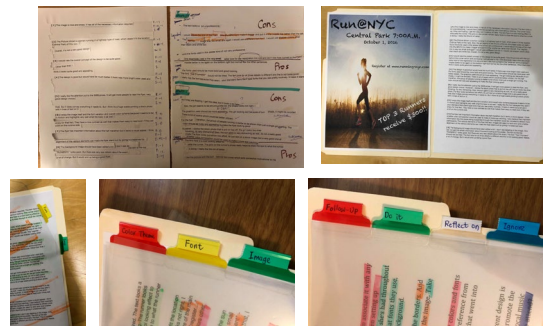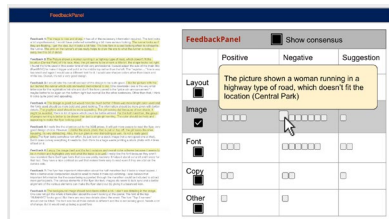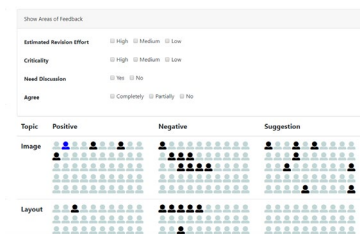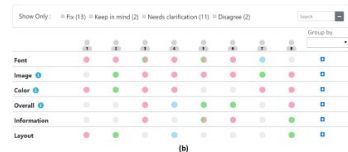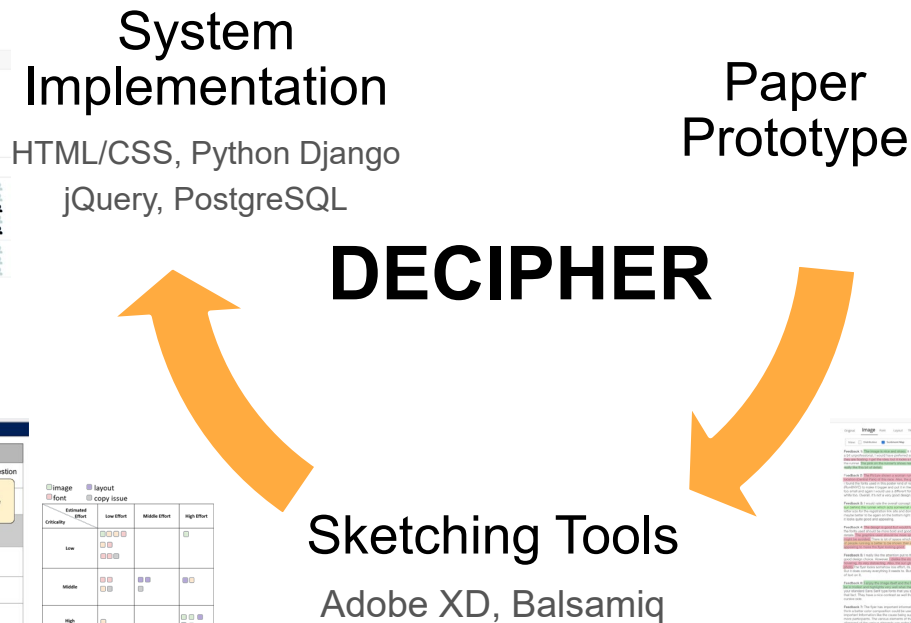
Final: Map Feedback Collection

(a) A creative project
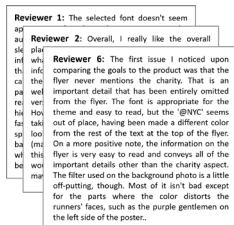
(b) A collection of feedback for that creative project.
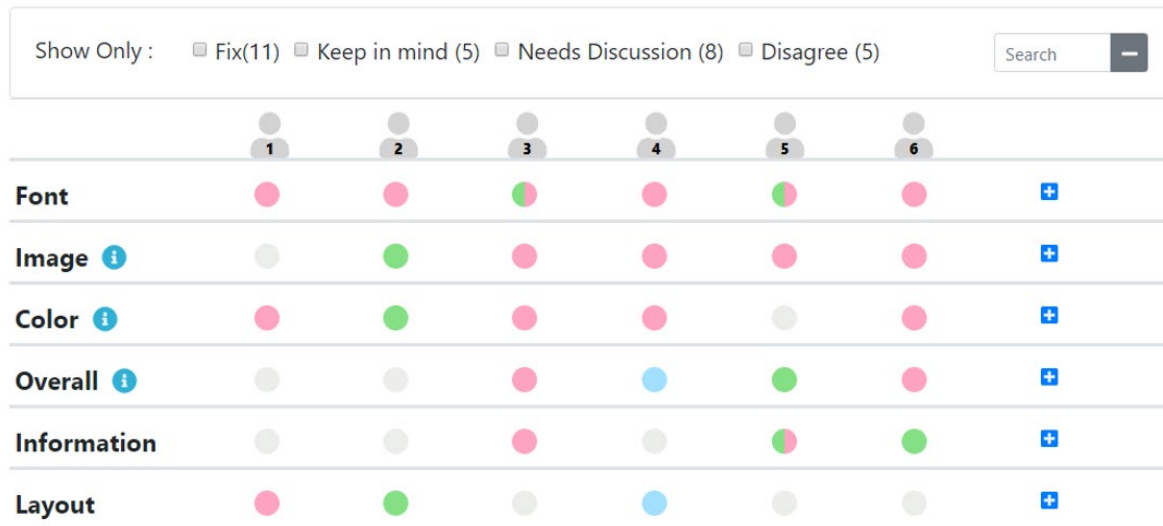
(c) The collection of feedback visualized using a preliminary prototype of Decipher

Descriptions

In **(a)** the user has created an in-progress solution for a creative project and in **(b)** has received unstructured feedback written by multiple providers (only a sample of the feedback is shown). In **(c)**, the user has imported the feedback into Decipher to visualize the topic and sentiment structure within the collection of feedback. The user can identify strengths and weaknesses of different aspects of the work (row-wise comparison) and compare opinions between providers (column-wise comparison) without having to revisit the details of the content. The user can also annotate statements in the collection of feedback that identify issues that need to be corrected in a revised solution or need further clarification. The figure is best viewed in color.

User interactions in Decipher

Enable users to navigate feedback using its topic and sentiment structure

Read ideas in the context of the whole piece of feedback
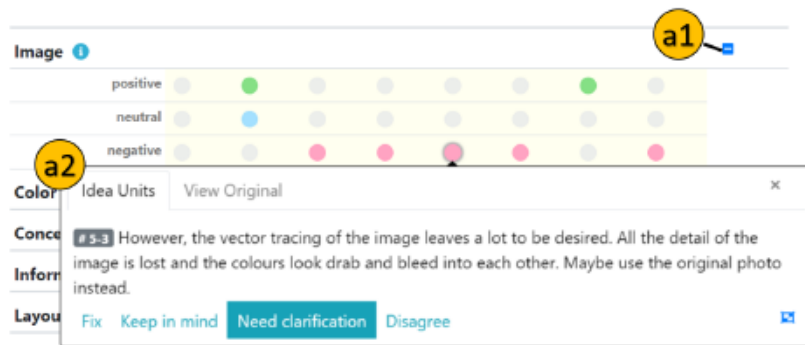
(a) Jun can expand a topic row by clicking the blue plus button (a1) and hovering over each circle to review the feedback details in (a2). Jun can mark the feedback unit using one of the four interpretation labels at the bottom of the window.
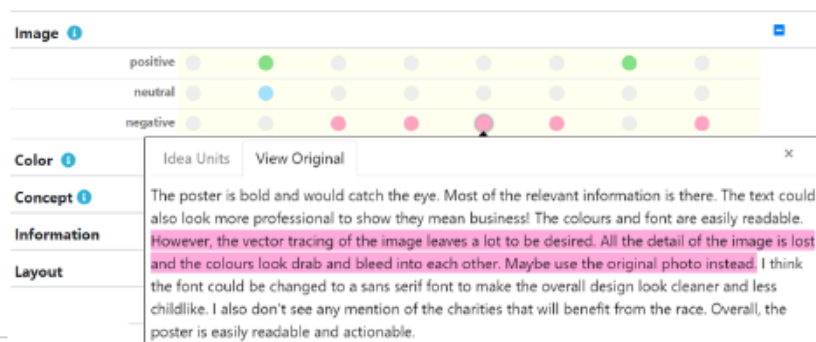
(b) Switching to the "View Original" tab will show the unit of feedback (highlighted) in the context of the whole piece of feedback written by that provider.

User interactions in Decipher

Support feedback comparisons by user archetypes

(c) Jun can group the feedback providers by selecting an attribute in the drop-down list in (c1). In the example, the providers are grouped by their perspective (i.e., client or external user).

Allow users to record intended actions for feedback statements
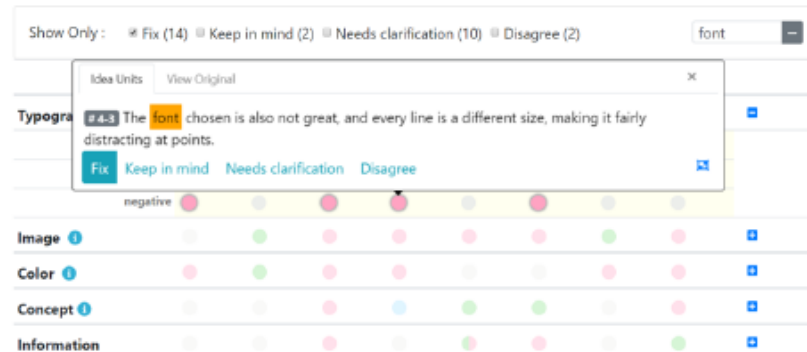
(d) The feedback units can be filtered by interpretation labels and keyword. Above, Jun highlights the feedback units that contain the keyword "font" and are marked as "Fix".

Usability Testing (N=20)

Each participant used both Decipher and Google Document to review a set of feedback

- Compare user **strategies** for reviewing feedback
  — survey responses, interview data, behavior observation

- Collect **insights** users identify in the feedback
  — task responses

- Compare **perceived effectiveness** of the feedback interpretation process
  — survey responses, interview data

vs.

Results Highlight

One-sampled t-test * =p<.05

Effective Feedback Acquisition in Online Spaces

Online crowd platforms offer unprecedented opportunities for designers to connect with potential users for feedback quickly and affordably

Social Crowds

r/design_critiques · Posted by u/sahaironak8 2 hours ago

Can i get some feedback on this poster that I made recently.

https://www.behance.net/gallery/95088515/Not-Safe-For-Work ✅

2 Comments · Give Award · Share · ⋯ · 100% Upvoted

Enjoyment Crowds

@ · 11m

I wanted to try something new

Simple anime themed Avi
For @gfxisdead
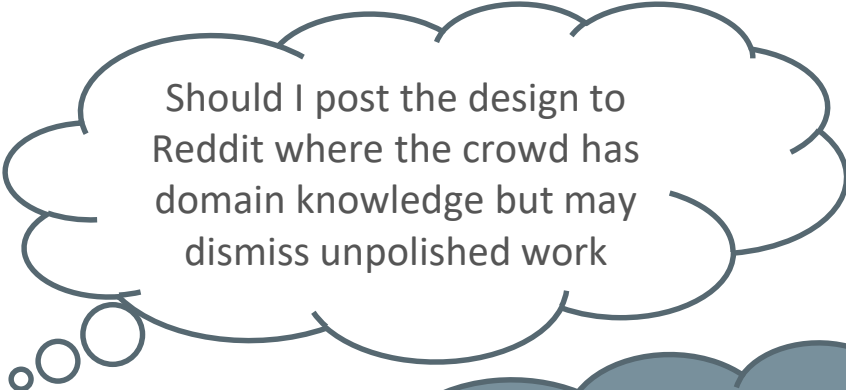
Support and **feedback** is appreciated
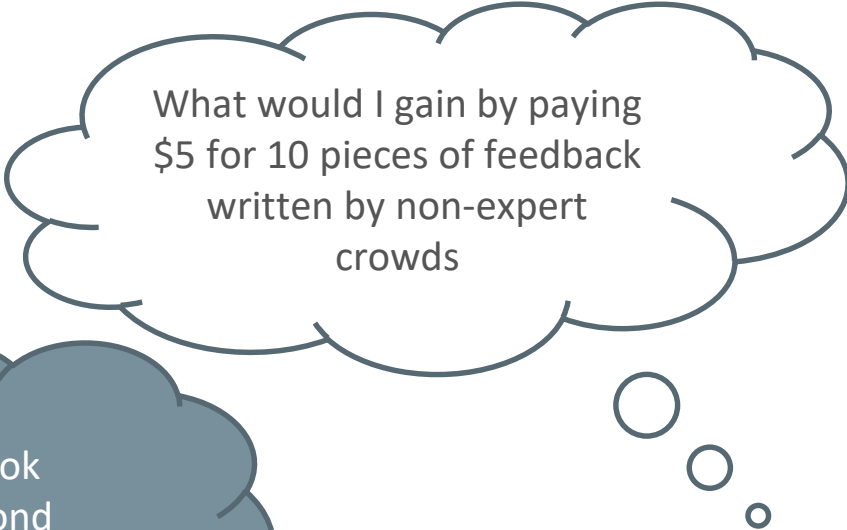
Financial Crowds

BUT... No empirical guidance about how to leverage multiple crowds to generate the desired feedback

Should I post the design to Reddit where the crowd has domain knowledge but may dismiss unpolished work

What would I gain by paying $5 for 10 pieces of feedback written by non-expert crowds

How would my Facebook friends react to my second round of feedback seeking post?

Research Questions

RQ1: How do different crowd genres compare in terms of the quantity, quality, and content of the feedback generated?

RQ2: How does the design iteration (initial vs. revised) affect the feedback generated by the different crowds?

RQ3: What are designers' perceptions of getting feedback from the different crowd genres in the design process?

Design Samples (SELECTED)
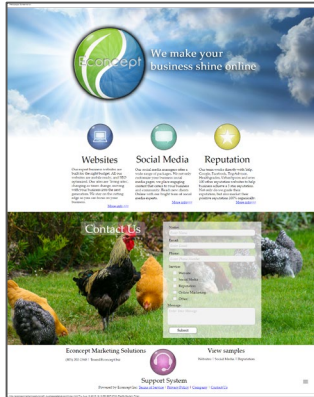
Web Designs
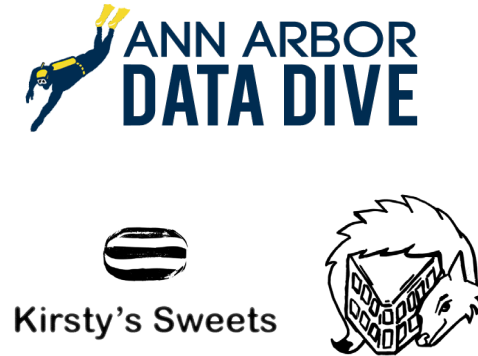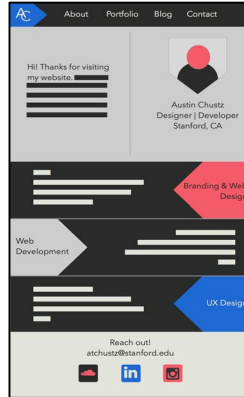
Logo Designs

Poster Designs

Field Experiment (N=22)

Create Anonymous Feedback Forms

- Confirm the provider incentive

- Mitigate social pressure

- Collect demographic information

Result Highlight 1

Medium

Applause from you and 1 other

Braňo Šandala Follow
#design #business #love
Feb 15 · 6 min read

Designing a Rusyn book with the help of crowds, prototypes, and JavaScript
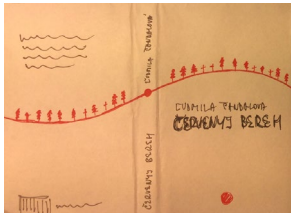
Bringing crowds to critique the design

I started to work on the book cover way earlier than I anticipated. I got invited to take part in the research study on the *effectiveness of online crowd-based design critique*. As a part of the game, I got to present the work-in-progress visual design. And other participants around the world would give me a feedback on it. I didn't have anything to share at that time, so I decided to start working on the book cover instead.

I sketched a couple of variants and picked the promising ones to get early feedback. I provided a bit of context as well—the book plot, the intended audience and a thought process behind the initial ideas.

I got to admit, I was a bit skeptical about the concept of anonymous critique, and the outcome surprised me. Within a couple of days, I've received 30+ well-aimed design reviews. Reviewing all that feedback, I realized that my early sketches were a step in the wrong direction. I stepped on the wrong foot because I made a rookie mistake. I dwelled on one of the initial ideas and did not explore the other ways. I got hooked on it as it was a minimalistic concept, but it was missing the human aspect of the book.

https://medium.com/@surfinzap/designing-a-rusyn-book-with-the-help-of-crowds-prototypes-and-javascript-1cdcf1bd9991

Result Highlight 2: Feedback Quality
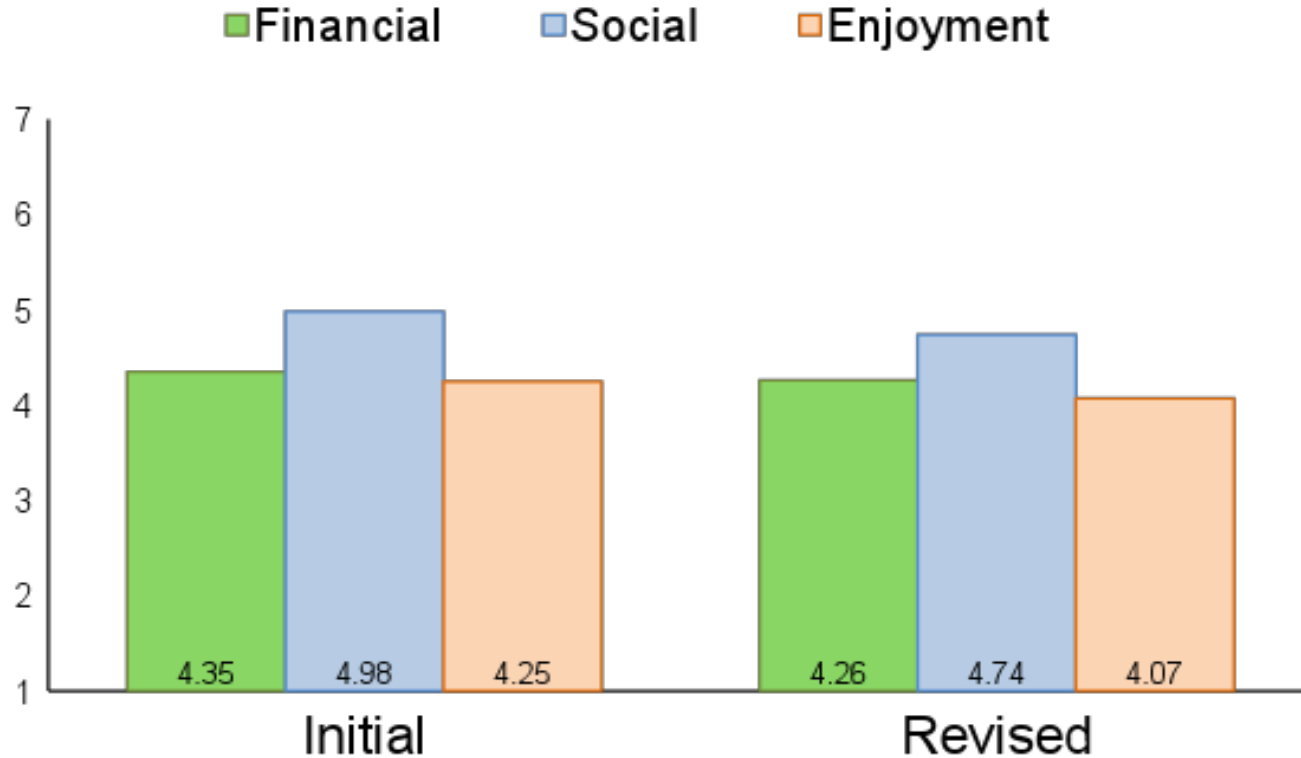
X^2 (1, N=120)=30.0; *p< 0.0001*

Result Highlight 3: Frequencies of Idea Units by Genre and Iteration

Category	Initial Iteration				Revised Iteration			
	Financial	Social	Enjoyment	Total	Financial	Social	Enjoyment	Total
Judgment	54.1% (156)	54.8% (107)	50.9% (52)	53.8% (315)	62.6% (206)	58.9% (66)	48% (36)	59.6% (308)
Recommendation	35.7% (103)	24.1% (47)	21.5% (22)	29.4% (172)	29.1% (96)	25% (28)	13% (10)	25.9% (134)
Investigation	0.7% (2)	4.6% (9)	4.9% (5)	2.7% (16)	0	1.7% (2)	4% (3)	0.9% (5)
Interpretation	2.7% (8)	2.5% (5)	0.9% (1)	2.4% (14)	1.5% (5)	2.6% (3)	0	1.5% (8)
Brainstorming	3.1% (9)	3% (6)	2.9% (3)	3% (18)	3% (10)	2.6% (3)	0	2.5% (13)
Process	0	7.6% (15)	13.7% (14)	5% (29)	0.9% (3)	3.5% (4)	20% (15)	4.2% (22)
Comparison	0	0	0	0	1.2% (4)	0	5.3% (4)	1.5% (8)
Association	2.7% (8)	0.5% (1)	2.9% (3)	2% (12)	0.6% (2)	1.7% (2)	4% (3)	1.4% (7)
Identity-invoking	0	0	0	0	0	0	0	0
Total Idea Units	288	195	102	585	329	112	75	516

More investigation on concept stage design, More judgment on revised

Initial

Revised

Investigation

Will there be links to your past projects?

Is the color at the very bottom different from the color in the topmost grey part?
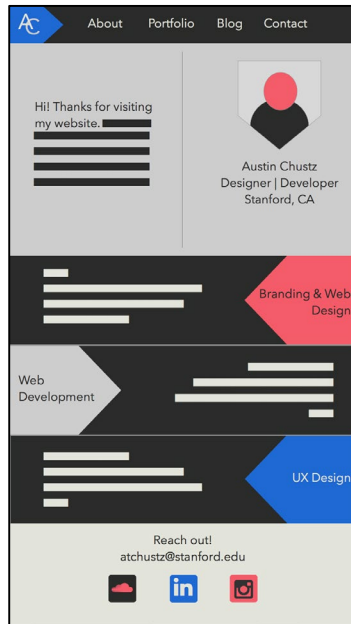
Judgment

The background color combination and design is good.

I like the layout of the design so far. However, the font choices need to be varied.

User Insights from Interview

Enable to make evidence-based design decisions

" "…with external feedback, I can finally convince my boss to remove the unnecessary background image." "

- P1065, Female, Web Designer

Initial
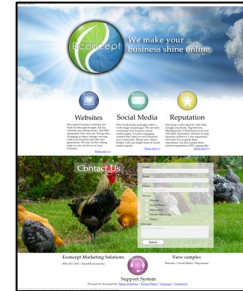
Revised

Prioritize feedback based on the popularity of an issues

" "I see multiple people mention the same thing, and that to me, I think just not like a single person give me the same feedback, but many people think the similar way, and kind of carries more weight to me to consider it." "

- P1036, Male, Book Cover Designer

User Insights for Design Implications

" I feel that in the revised iteration there were a lot more general feedback than specific suggestion, which I got a lot from my first design, and I don't know if that's necessarily because people thought that it was a completed work and they just wanted to give me general feedback. "

- P1022, Female, Logo Designer

User Insights for Design Implications

" It is important to have feedback for the initial design rather than the revised one. But it would be nice if you can find people reviewing the previous iteration to view the current one. "

- P1026, Male, Logo Designer

Designing Reflection Activity for Iterative Design

The Reflective Practitioner

How Professionals Think in Action

Donald A. Schön
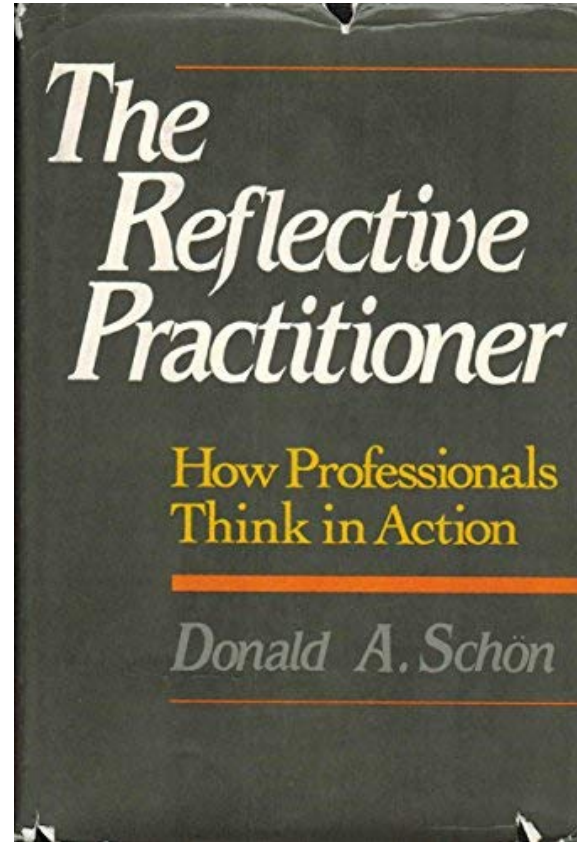
Research Questions

RQ1: How does integrating a reflection activity into an iterative design process affect perceived design quality, degree of revision, and perceptions of design performance?

RQ2: How does the sequence in which the reflection activity is performed – either before or after reviewing external feedback – affect these same measures?

RQ3: What are the perceived benefits and limitations of integrating a reflection activity into the design process?

Reflection Activity

1. Please describe the overall concept and theme of your initial design.

2. What do you think was done particularly well in your initial design? Please explain why. *(required)*

3. What could be the weakness of your initial design? And in what ways do you think the initial design can be improved? *(required)*

Submit

Based on Donald Schön's Reflection Theory

Online Study (N=90)
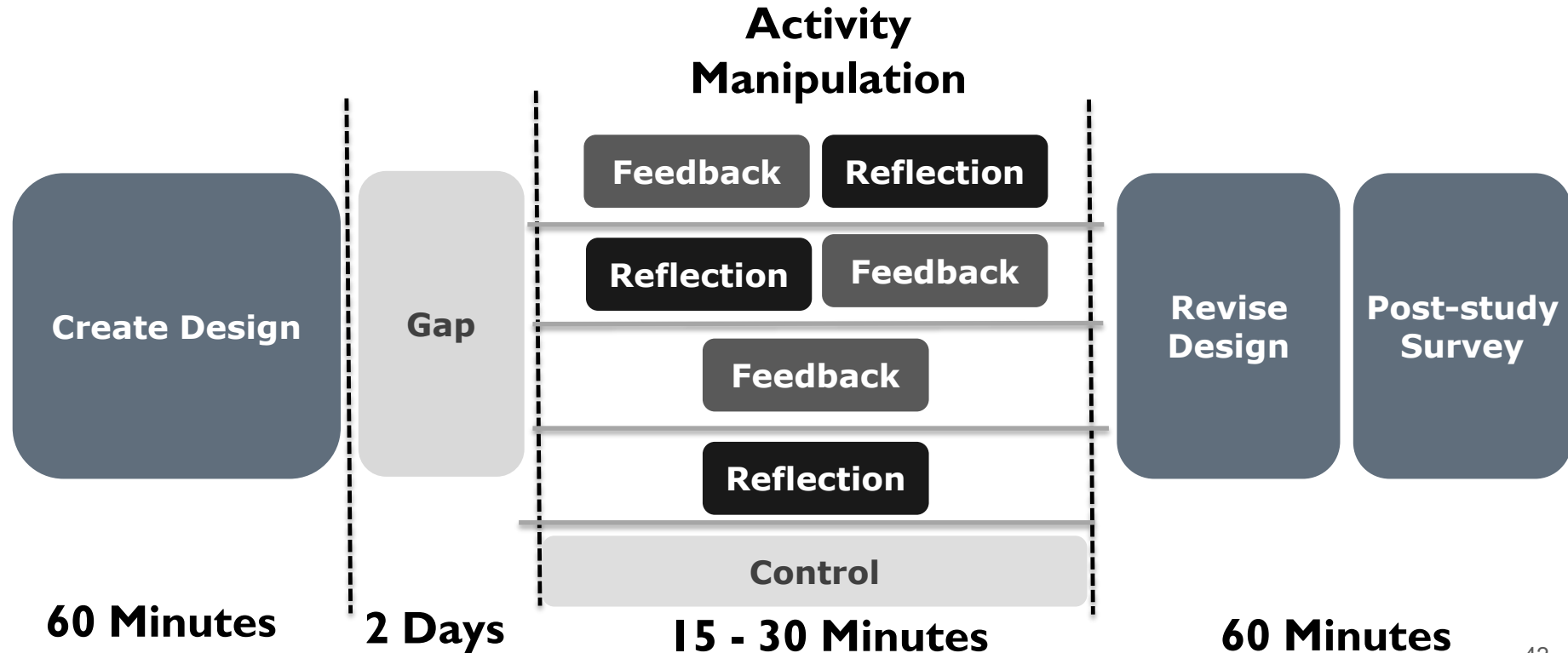
Design Examples

Coupling Feedback Review and Reflection Yielded Highest Degree of Change (7-point Likert item)

Activity	Experts' Ratings	Designers' Ratings
R	2.53 (1.7)	3.9 (1.5)
F	2.57 (1.4)	**4.1 (1.7)***
RF	**2.89 (1.7)***	3.4 (1.6)
FR	**2.67 (1.1)***	**4.7 (1.3)***
C	1.90 (1.1)	2.6 (1.6)

R: Reflect-only   **RF:** Reflect-before-Feedback   **C:** No Activity
F: Feedback-only   **FR:** Reflect-after-Feedback

Master's Thesis

Human-centric and Situation-aware Pervasive Healthcare System in the Hospital for Elderly People

Research Overview

Stage 1   **Survey On User Need**

Stage 2   **Design Non-obtrusive Sensing Environment**

Stage 3   **Construct Situation Recognizers (Skip)**

Stage 4   **Design Persuasive Technology**

Multi-disciplinary Research
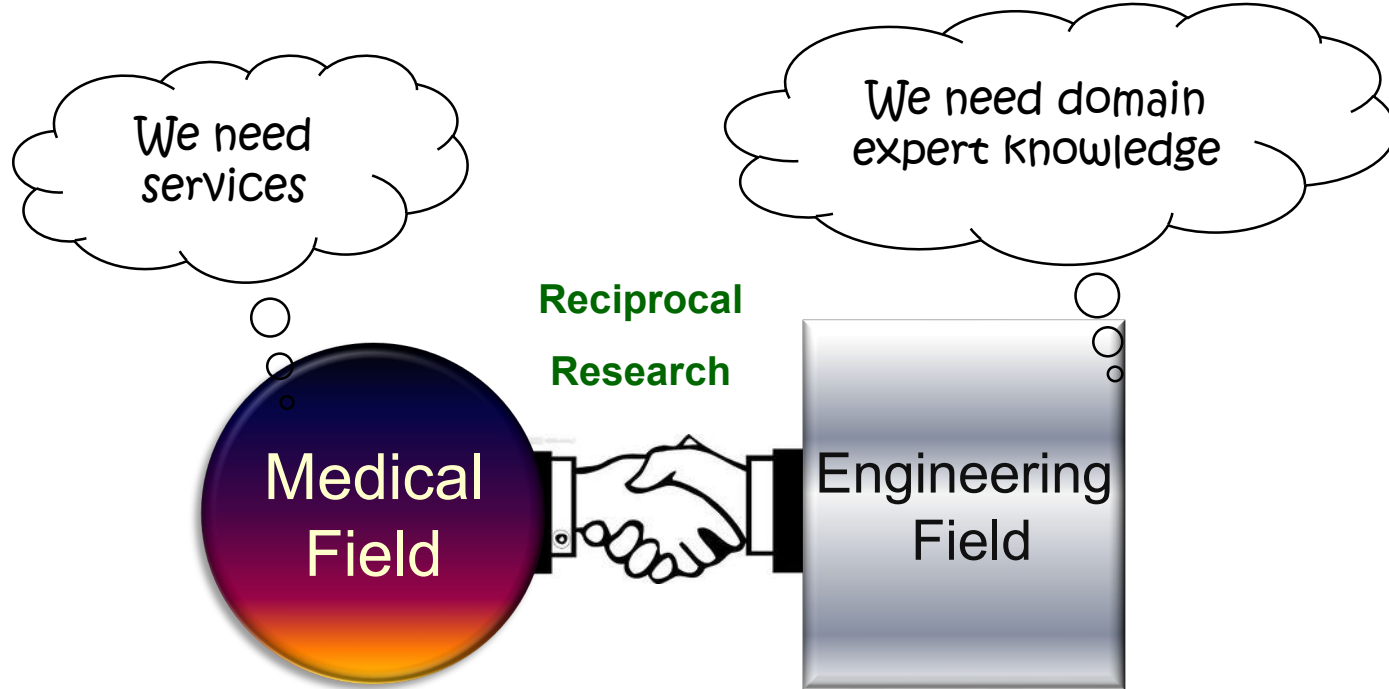
Stage 1: Survey on User Need

- Identified the key Activity of Daily Life concerned by clinicians and caregivers
  - Two domain expert interviews
  - Field observation in National Taiwan University Hospital (Shadowed 10 work shifts)
  - Monthly cross-functional team meeting

- Developed trust with caregivers, patients, and medical staff after field observation
  - Two domain expert interviews

Prof. Shih-Dai Li

Flowchart (left)

Exchange Patient Condition from Previous Nurse Shift / to Next Nurse Shift

Preparing Medical Equipment and Medicine

Ward Round Start
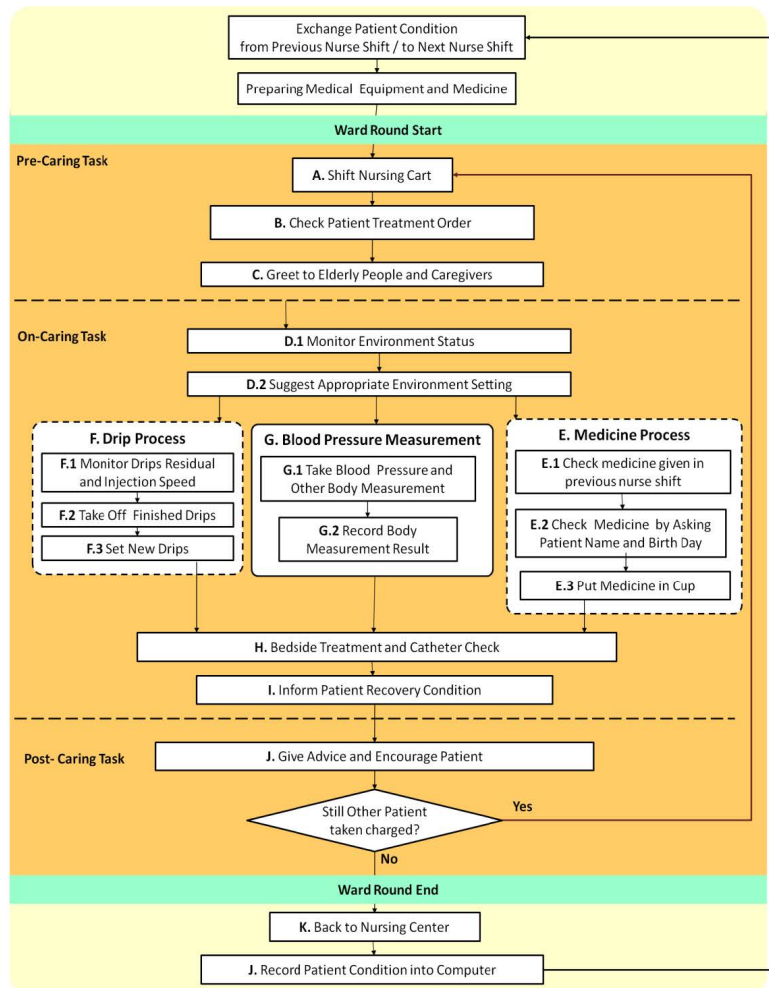
Pre-Caring Task

A. Shift Nursing Cart

B. Check Patient Treatment Order

C. Greet to Elderly People and Caregivers

On-Caring Task

D.1 Monitor Environment Status

D.2 Suggest Appropriate Environment Setting

F. Drip Process
- F.1 Monitor Drips Residual and Injection Speed
- F.2 Take Off Finished Drips
- F.3 Set New Drips

G. Blood Pressure Measurement
- G.1 Take Blood Pressure and Other Body Measurement
- G.2 Record Body Measurement Result

E. Medicine Process
- E.1 Check medicine given in previous nurse shift
- E.2 Check Medicine by Asking Patient Name and Birth Day
- E.3 Put Medicine in Cup

H. Bedside Treatment and Catheter Check

I. Inform Patient Recovery Condition

Post-Caring Task

J. Give Advice and Encourage Patient

Still Other Patient taken charged? — Yes / No

Ward Round End

K. Back to Nursing Center

J. Record Patient Condition into Computer

Key Situations to be monitored

Bed-area Situation Monitoring

- Leaving bed, Turning Body Over

Bathroom Situation Monitoring

- Hygiene, Toilet usage

Social Engagement Monitoring

- Watch TV, Talk

Caregiver Absent Monitoring

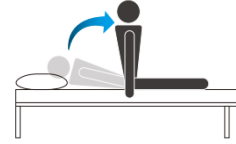- Safety

49

Stage 2: Sensor Deployment

Considerations

- Damage of sensors

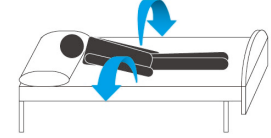- Reduce the number of sensors needed

Solutions

- Portable

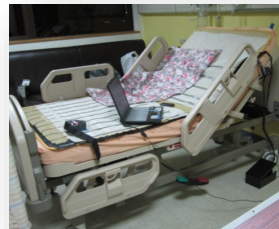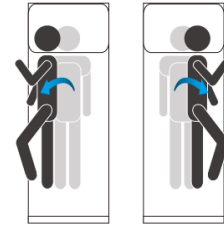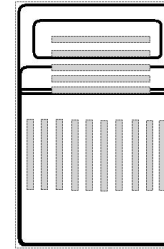- Waterproof

- Efficient Sensor arrangement

Lengthwise movement
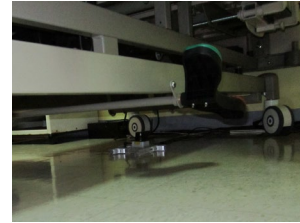
Leaving bed

Lateral movement

Sensor Deployment: Caregiver Presence

Considerations

- Avoid vision-based and wearable RFID or other sensors.

- Active and non-active movements are both monitored

Solutions

- Active status: Motion sensors

- Non-active status (or active status): Laser range finder

Sensor Deployment: Social Engagement

Considerations

    - Human interaction: Chatting

    - Involve appliance : Watching TV

Solutions

    - Human interaction: Low-resolution sound sensor

    - Involve appliance or instruments: Current sensor

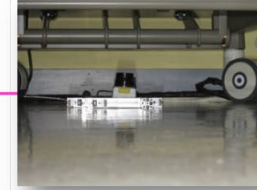# Sensor Deployment: Bathroom
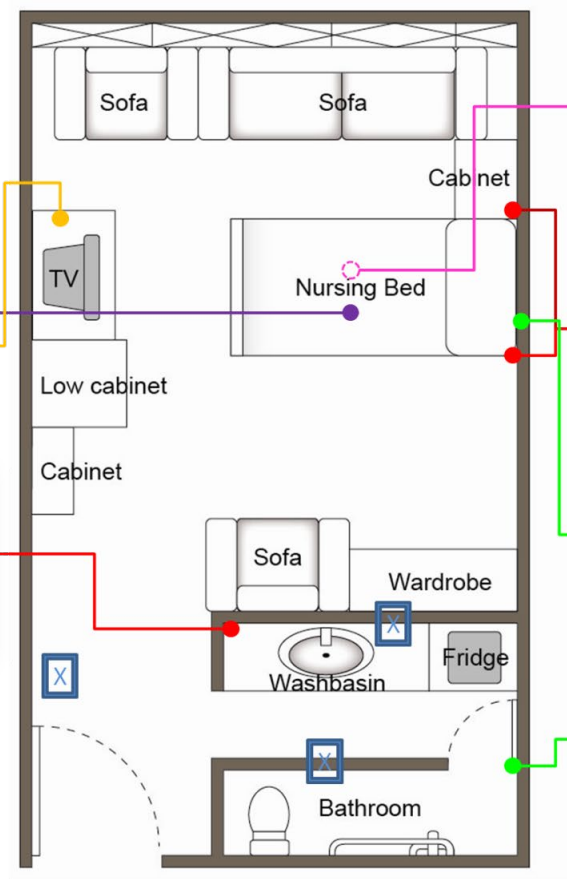
Considerations

- Highly privacy concerns

- Various environment states in the bathroom

- Noise in the bathroom

Solutions

- Low-resolution sound detector

- Light, temperature, and humidity sensors

- Motion sensor

- Current sensor
- Pressure sensor
- Light, temperature, humidity sensor
- Motion sensor
- Laser Range Finder(under the bed)
- Power supply

Sofa
Sofa
Cabinet
TV
Nursing Bed
Low cabinet
Cabinet
Sofa
Wardrobe
Washbasin
Fridge
Bathroom

Snapshots of Environment

Data Annotation and Sensor Monitoring
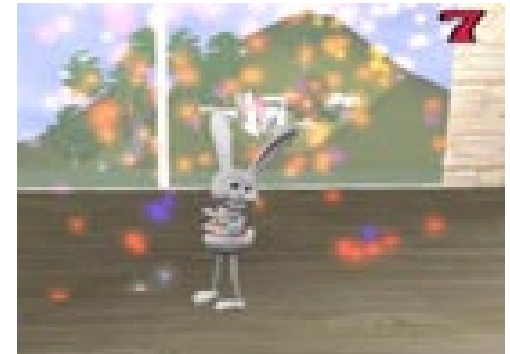
Persuasive Strategy

Concept testing with 9 elderly person

Table 1. Timely reminders or encouragement for target activities

Detected Activities	Description of system feedback
Sleeping	If a sleeping behavior is detected, the system automatically plays music for a while.
Sitting on bed	When the elderly wakes up and sits on the bed from sleeping, the *Home Keeper Rabbit* performs an animation with a cheerful greeting.
Using Walking Cane	Current number of steps will be shown at upper right corner of the screen.
Leaving bed	When the user is about to leaving the bed, the *Home Keeper Rabbit* reminds its potential hazards (i.e. tripping) and inspires the elderly to do more exercise.

Table 2. Persuasion policies supported for interested activity episode

Activity episode	Description of system feedback
Sleeping	When an elderly sleeps more than one hour in the *daytime*, the *Home Keeper Rabbit* speaks loudly to wake him/her up
Walking	Four levels of walking states are evaluated. Higher level means more steps the elderly has walked via the walking cane. *Home Keeper Rabbit* encourages the elderly when the elderly reaches a higher level

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