Design + Theater + CC
Virtual Reality project for CAVE2
In Collaboration with IBM

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UIC COMPUTER SCIENCE
UIC School of Design

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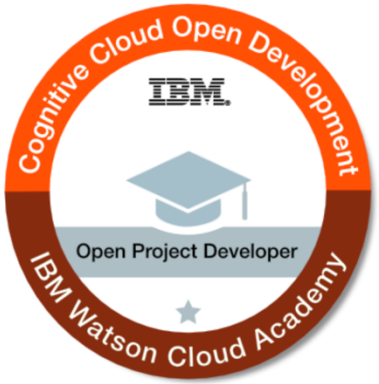
Jeff Nyhoff (IBM+CS+Theater)
Karla Rangel (IBM)
Ron Mujambar (IBM)

- Introduction - Why Design + Theater?
- *Hummingbird* VR Theater performance
- Jeff Nyhoff- Design+ Theater+ Computer history
- How can we design the future?
- Project concepts
- Methods, logistics and schedule
- Assignment 2 - VR proposal

Experimental
Design+Theater VR Project

IBM badge
Open Project Developer Level I



Time: Months

Open Project Developer Level I

Issued by IBM

This badge earner has demonstrated their ability to apply design thinking and develop a new service-based asset aligned to Open Projects initiatives sponsored by IBM and Industry Partners. This individual understands how to use agile tools, including the IBM Cloud, to accelerate their pace of innovation, how to use APIs and microservices, and to effectively collaborate across teams to build open source systems that use data to learn and contribute to socially responsible cognitive solutions.

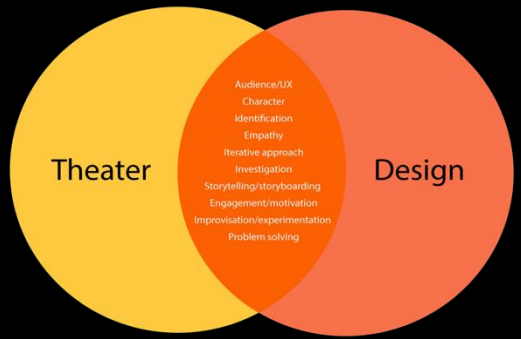
Skills

Agile | API | API Economy | Artificial Intelligence | Bluemix | Cloud | Cloud Computing

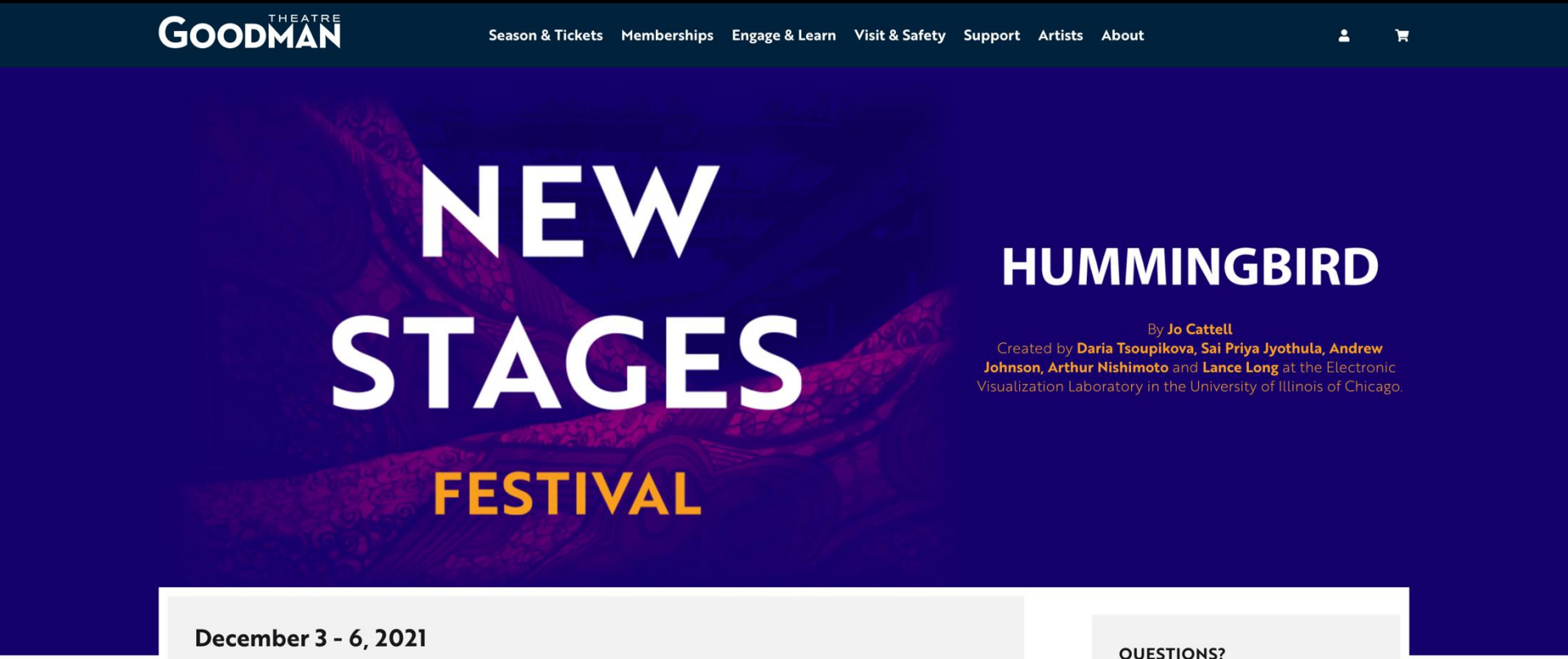
Why design + theater + science? Inspirations and Prior work

Design + Theater

- Audience/user experience
- Character (typographic vs theater character)
- Identification
- Empathy
- Iterative approach
- Investigation / Theoretical Research / dramaturgy/ comparative analysis
- Storytelling/storyboarding / plot/ events
- Engagement/motivation
- Improvisation – experimentation
- Problem solving skills – constraints / limitations / resources: time/funding/space



Hummingbird - Live Theater Adventure Empowering Collaboration in VR



Hummingbird

Hummingbird is a theatrical adventure that questions reality, connection and social responsibility in a digital society. The performance merges the real and virtual worlds in a shared collaborative multi-user interaction. The project was designed for the Goodman Theater New Stages showcasing experimental and ground-breaking theater works.

A gutsy teen has to outsmart her mother's narcissistic boss and survive dangerous new technology in *Hummingbird:* a live, immersive adventure that transforms theatrical storytelling utilizing cutting-edge, virtual reality technology.

More than 40 Hummingbird performances were attended by over 500 people

Goodman Theatre

Chicago Children's Theatre

SIGGRAPH Immersive Pavilion

Team: Design + Theater + Computer Science

- Daria Tsoupikova (Professor, School of Design /project PI)
- Jo Cattell (project Playwright/Theater Director)
- Dr. Andrew Johnson (project Scientific Director, Professor of Computer Science and the Director of Research at the Electronic Visualization Laboratory (EVL))
- Lance Long (project Network Director, a Sr. Research Programmer, EVL)
- Arthur Nishimoto (project developer, PhD candidate in Computer Science, EVL)
- Sai Priya Jyothula (project developer, PhD candidate in Computer Science, EVL)
- Stephanie Shum (project Lead Actress)

Megumi Katayama (Music composer)
Liviu Pasare (Videographer)
Dwight Sora, Theresa Ro, Kim Fukawa (Actors)
Devonte Washington, Scott Danielson (Actors)
Simon Hedger & Debbie Banos (voices)
Denise Savas (Stage manager)
Chizuko Wallestad (Japanese language advisor)
Grace Spee and Caleb Spalding (Exhibition Experience)
Volunteers - Linda Rueda-Ramirez, Kayla Nguyen, Angelica Villegas, Jonas Talandis, and Farah Kamleh


HUMMINGBIRD

HUMMINGBIRD

COLLABORATIVE VIRTUAL REALITY FOR TELE-IMMERSIVE INTERACTIVE THEATRE

A gutsy teen has to outsmart her mothers narcissistic boss and survive dangerous new technology in hummingbird: a live, immersive adventure that transforms theatrical storytelling utilizing cutting-edge, virtual reality technology •••

Hummingbird premiered at the Goodman Theater New Stages Festival 2021, an annual celebration of innovative, risky new theater work by some of the country's most singular and ambitious playwrights. Hummingbird was the only VR innovative theater performance selected for the exhibition at the

Interaction and Collaboration in VR

- providing active agency to a group of participants
- focusing on real-time collaboration in VR
- actively collaborating throughout the entire experience
- directly interacting with each other, the actors and the story
- playing an active role in the creative process of the work
- Each person must participate for the story to move forward.

The story is driven by collaborative interaction performed by the participants together. Hummingbird creates a space where each participant is able to work independently but must also recognize the importance of working with the other people in their group.

Jeff Nyhoff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Impact

- Demonstrates how VR can revolutionize theatrical storytelling by enabling traditional theater to narrate epic stories that were once considered too ambitious for traditional stage by extending live theater and making VR accessible to a broader audience.

- Serves as a prototype for successful partnerships between nonprofit theater and interdisciplinary research institutions to increase opportunities for cross-disciplinary student education.

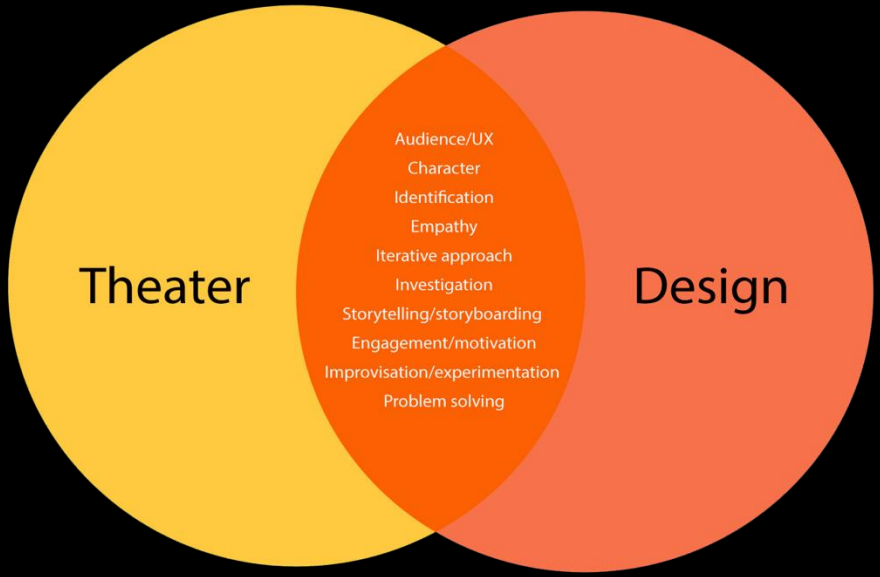
- The performance pushes the boundaries of active collaboration by giving audience agency and active control over their actions.

- Hummingbird's collaborative processes, methods and collaboration tools enabled design of the interactive audience's experience focusing on teamwork in VR.

Hummingbird Video
https://www.youtube.com/watch?v=4JueeyZqh5c

VR Project Concepts based on 17 UN Sustainable Goals

No Poverty
Zero Hunger
Good Health and Well-being
Quality Education
Gender Equality
Clean Water and Sanitation
Affordable and Clean Energy
Decent Work and Economic Growth
Industry, Innovation and Infrastructure
Reduced Inequality
Sustainable Cities and Communities
Responsible Consumption and Production
Climate Action
Life Below Water
Life on Land
Peace, Justice and Strong Institutions
Partnerships for the Goals



VR Project Concepts based on 17 UN Sustainable Goals

United Nations | Department of Economic and Social Affairs
Sustainable Development

Home | SDG Knowledge | Intergovernmental Processes | HLPF | SIDS | SDG Actions | Engage | News | About

THE 17 GOALS

169 Targets
4010 Events
1352 Publications
7916 Actions

VR Project Concepts based on 17 UN Sustainable Goals

Based on CHI2025 and HCII2025 Student Design Competitions

Recent Posts

CHI 2025 — Papers Track, post-review report (Round 1)

CHI 2025 Registration is Now Open!

SV T-Shirt Design Competition

Call for SVs

ACM code of conduct in review

Upcoming Deadlines

All times are in Anywhere on Earth (AoE) time zone. The submission site of each track will open approximately four weeks before its submission deadline.

Student Design Competition

Student Design Competition is in-person only.

Important Dates

All times are in Anywhere on Earth (AoE) time zone. When the deadline is day *D*, the last time to submit is when *D* ends AoE. Check your local time in AoE.

- Submission deadline: **Thursday, January 23, 2025**
- Notification: **Thursday, February 20, 2025**
- e-rights completion deadline: **Thursday, February 27, 2025**
- Publication-ready deadline: **Thursday, March 6, 2025**
- TAPS Closes: **Thursday, March 6, 2025**

Submission Details

Based on CHI2025 and HCII2025 Student Design Competitions

HCI International 2025
22 - 27 June • Gothenburg, Sweden

HOME ABOUT SUBMISSIONS REGISTRATION PROGRAM ACCOMMODATION EXHIBITION

HCII2025 STUDENT DESIGN COMPETITION

PRESENT YOUR DESIGN IDEA TO AN INTERNATIONAL COMMITTEE
Present your novel idea in a simple, concise and visually appealing manner

YOUR WORK INCLUDED IN AN ACCEPTED PAPER OR POSTER, CAN BE ALSO SUBMITTED FOR THE COMPETITION
Publish your work with Springer and also participate in the competition

ALL ACCEPTED DESING IDEAS WILL BE PRESENTED DURING THE CONFERENCE
All accepted video clips will be presented during a special session

POTENTIAL CONTRIBUTORS
The competition is open to College and University undergraduate and graduate students of all grades.

SUBMIT A DESIGN

Students are invited to submit an up to 5-minute video clip and an abstract (300 words) summarizing their design idea

Deadline for Submission: 7 March 2025

SUBMIT YOUR IDEA

SELECTION PROCESS AND AWARDS

An international committee will be the jury.

- All video clip submissions accepted for the Student Design Competition will be presented during the Conference.

CHI Design Competition Guidelines

- Is your design clearly linked to one of the Sustainable Development Goals?
- Does your design specify and solve a relevant and “burning” problem?
- Does your design use technology in an appropriate and novel way?
- Was the design well-crafted and effectively presented?
- Was the design validated in an appropriate and valid way to demonstrate the fulfillment of your design goal?
- Was relevant prior work properly identified and cited?
- Were analysis, synthesis, design, and evaluation systematic and sufficient?
- Was the design developed far enough to demonstrate the key ideas?
- Were genuine stakeholders involved in the process of research, development, and evaluation?
- Were the research process and the involvement of stakeholders ethically appropriate (e.g., were institutional guidelines followed)?
- Did the team explore the entire ecosystem of stakeholders, conditions, and contexts?

Project Methods

- Typography
- Sound
- Materials
- Color
- First person perspective
- Navigation
- Interaction (collisions, triggers/events, linear/non-linear)
- FXs

Logistics

Work in teams (3)

Research / ideation

Collaborative development (G;uon, Github, other platforms)

Testing in the CAVE2 (2 Tests)

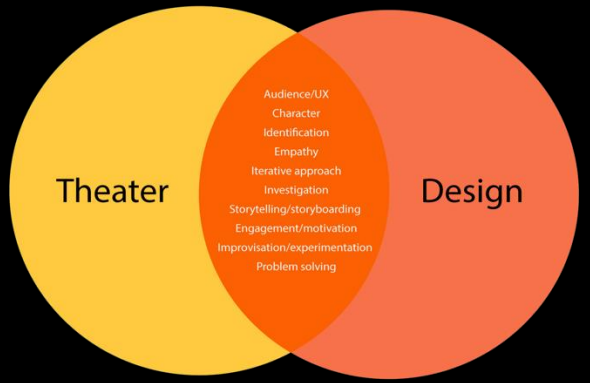
CAVE2 project review / exhibition

IBM online Gallery / Streaming

Submission to the Student Design Competition

Schedule

2-3 Concept proposal / Research / Storyboard
4 CAVE2 demos
5 VRE assets/scene
6 VRE aesthetics
7 Improv
8-9 Interaction
10 Testing 1 CAVE2
12 Testing 2 CAVE2
13 Exhibition CAVE2
14 CAVE video session
15 Project documentation / Submission



Assignment 2 – VR Project Proposal

Part 1: VR Project Proposal

Start by choosing your team preferred VR project concept (UN Goals)
Brainstorm about your project ideas with your team. Conduct relevant research.
Write project proposal/statement. Chose Project Title.

The concept needs to convey the purpose, meaning, and, most importantly, the solution of the proposed UN Sustainable Development Goal (SDG), and should not only be partially descriptive but also solution-focused.

Describe the specific solution as follows:

1. How this project can help advance research
   Explain how the project contributes to furthering the current research in the relevant field, addressing gaps or providing new insights.

2. How the project contributes to the resolution of the Sustainable Development Goal
   Detail how the project directly impacts the achievement of the specific SDG, outlining its role in advancing sustainability and addressing global challenges.

Design Competition Guidelines

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A2- VR Project Proposal Storyboard

Part 2. Storyboard

Using 6 images / sketches

any drawing/sketching techniques

To Illustrate how your solution addresses the chosen sustainable development goal.

Visualize your concept and interaction in a series of sketches connected into a storyboard. The Storyboard combines everything in a walk-through VR experience. How participant interacts with your solution inside the CAVE2?

1 – scene before interaction (what do we see when we enter the CAVE2)?
2 – first interaction
3 – result of the first interaction
4 – interaction #2
5 – result of the interaction #2
6 – final scene / conclusion

A2- VR Project Proposal Storyboard

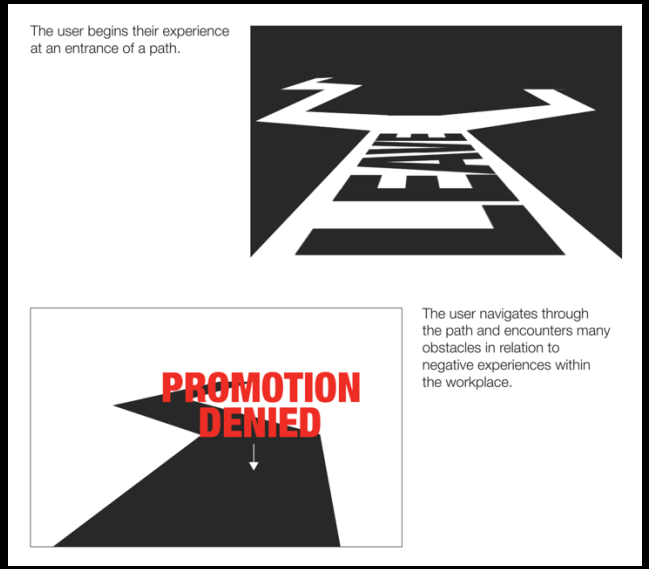
Guidelines:

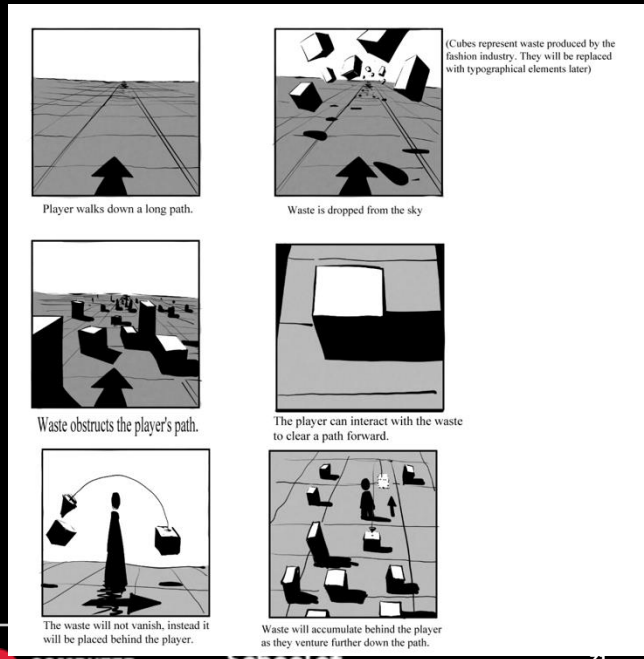
Typography only

No characters and no photorealism (limited time)

No games but gamification is welcome

See examples of the past Projects on the class website





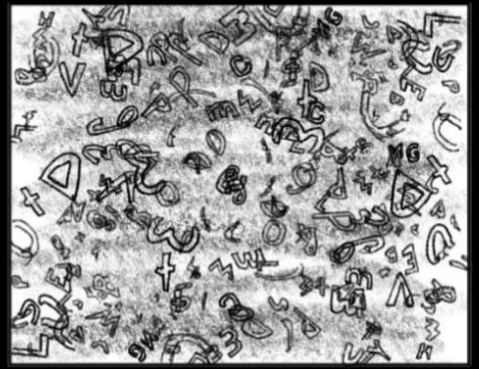
A2- VR Project Proposal Storyboard example

Problem

Current power infrastructure

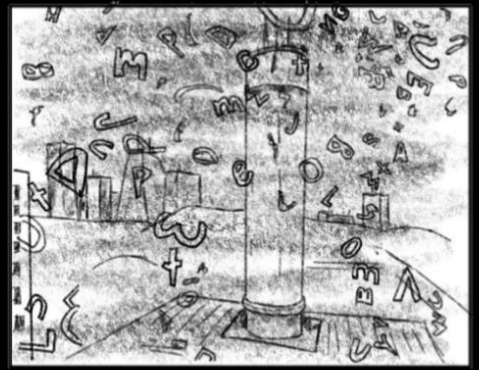
Causing smog & polution

User's View becomes blocked by smog

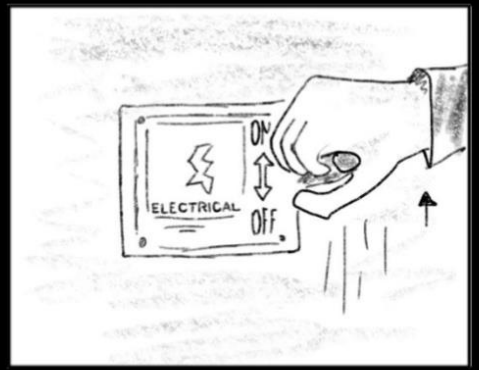


Solution

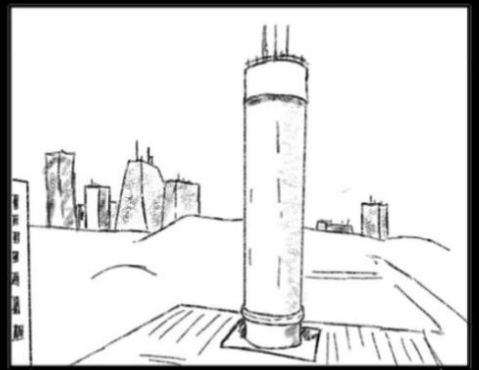
User has to find air purifier



Turn on the Power/Activate Purifier



Air purifier removes smog



Example student projects

Example CHI Student Design Projects

Creative Coding projects presented at HCI International 2024 and 2023

Eat me Up
https://link.springer.com/chapter/10.1007/978-3-031-78561-0_22

Life Underwater: A Virtual Reality Experience Below the Sea - Plastic Pollution on Marine Life, Human Responsibilities and Design Approach
https://2023.hci.international/Student_Design_Competition-Video_Presentations.html

CHI Student Design competition project examples

2017
https://www.youtube.com/watch?v=H09-1PgMQTI

2016
https://www.youtube.com/watch?v=Ylt67aR4DIo