PROMOTING COMPUTATIONAL THINKING SKILLS FOR BLIND AND VISUALLY IMPAIRED LEARNERS THROUGH ACCESSIBLE LIBRARY MAKERSPACE

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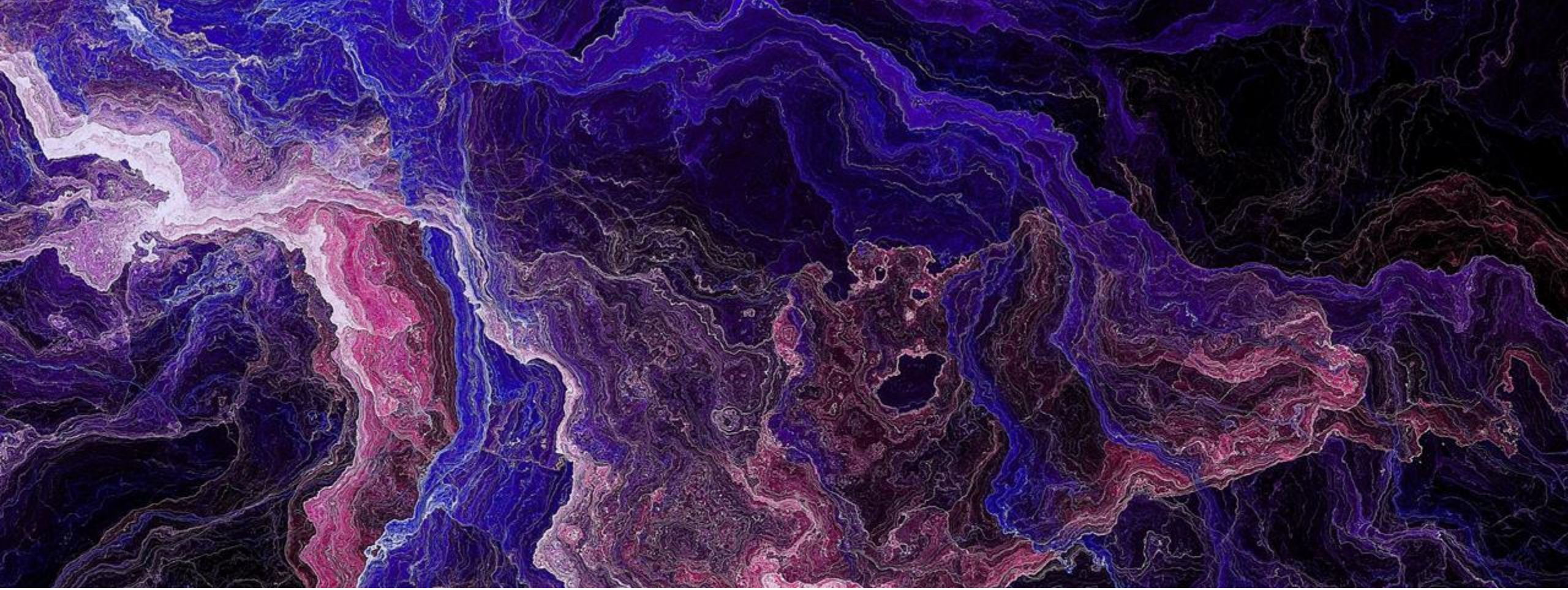

BACKGROUND

CHALLENGES


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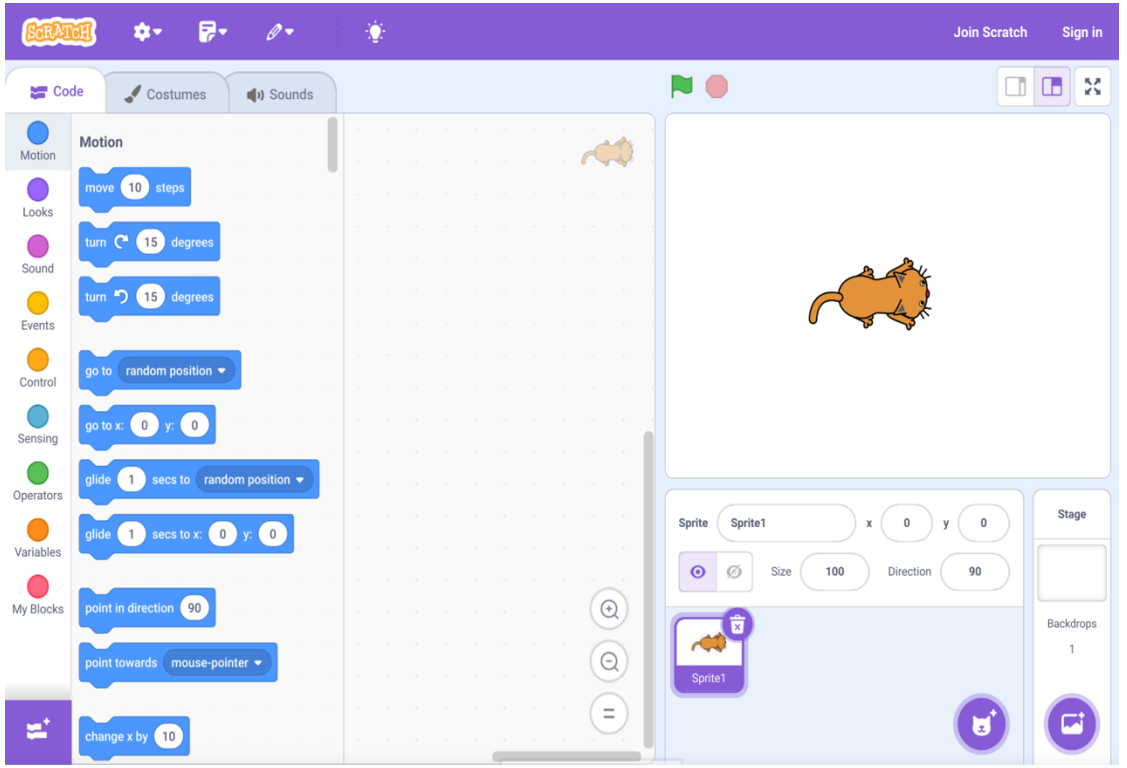
ROBOTICS
ACTIVITYS


SCRATCH
Join Scratch
Sign in
Code
Costumes
Sounds
Motion
Looks
Sound
Events
Control
Sensing
Operators
Variables
My Blocks
move 10 steps
turn 15 degrees
turn 15 degrees
go to random position
go to x: 0 y: 0
glide 1 secs to random position
glide 1 secs to x: 0 y: 0
point in direction 90
point towards mouse-pointer
change x by 10
Sprite
Sprite1
x 0
y 0
Size 100
Direction 90
Stage
Backdrops 1

OUR APPROACHES

- Maker learning approaches
  - Constructionism, object-to-think-with
- Interdependence
  - Co-designing between sighted and BVI people
- Ability-based design
  - Focus on our participants' abilities– a variety of non-visual and tangible approaches

Design and Research Questions

- **Design Question**: *How might we (HMW) create library makerspaces that are more welcoming, inclusive, and accessible for our BVI youth?*
- **Research Goal:** Investigate the experiences and perceptions of (1) BVI learners and (2) librarians and maker professionals who design and facilitate accessible maker learning with BVI learners

PHASES

- **Phase 1 (Aug 2022- Jan 2023): Assessment and Training; Study Setting Development**
  - Evaluate makerspace accessibility
  - Conduct accessibility training
- **Phase 2 (Feb 2023– July 2023): Prototype Design and Implementation; Data Collection**
  - Develop and run an accessible computational thinking program in a summer camp with BVI learners
- **Phase 3 (Aug 2023 – July 2024): Library Makerspaces Implementation; Data Collection & Analysis**
  - Disseminate the program: Train librarians and maker professionals
  - Implement the program in three library makerpaces
- **Phase 4 (Aug 2024- May 2025): Dissemination, Sustainability, and debrief; Data Analysis, Presentation and Publication of Research Findings**

ACCESSIBLE CODING AND ELECTRONICS PROGRAM

- Tangible Tools: Snap Circuits, Code Jumper, and Snapino
- Two-Day Summer Camps: Held at the Chicago Lighthouse in 2023
- Librarian Training Workshop
- Program Implementation: Illinois Public Library Makerspaces--Skokie, Glenview, North Riverside

Snap Circuits

Circuit and electronic components that are assembled with snaps on a simple rows-and-columns based grid.

Code Jumper

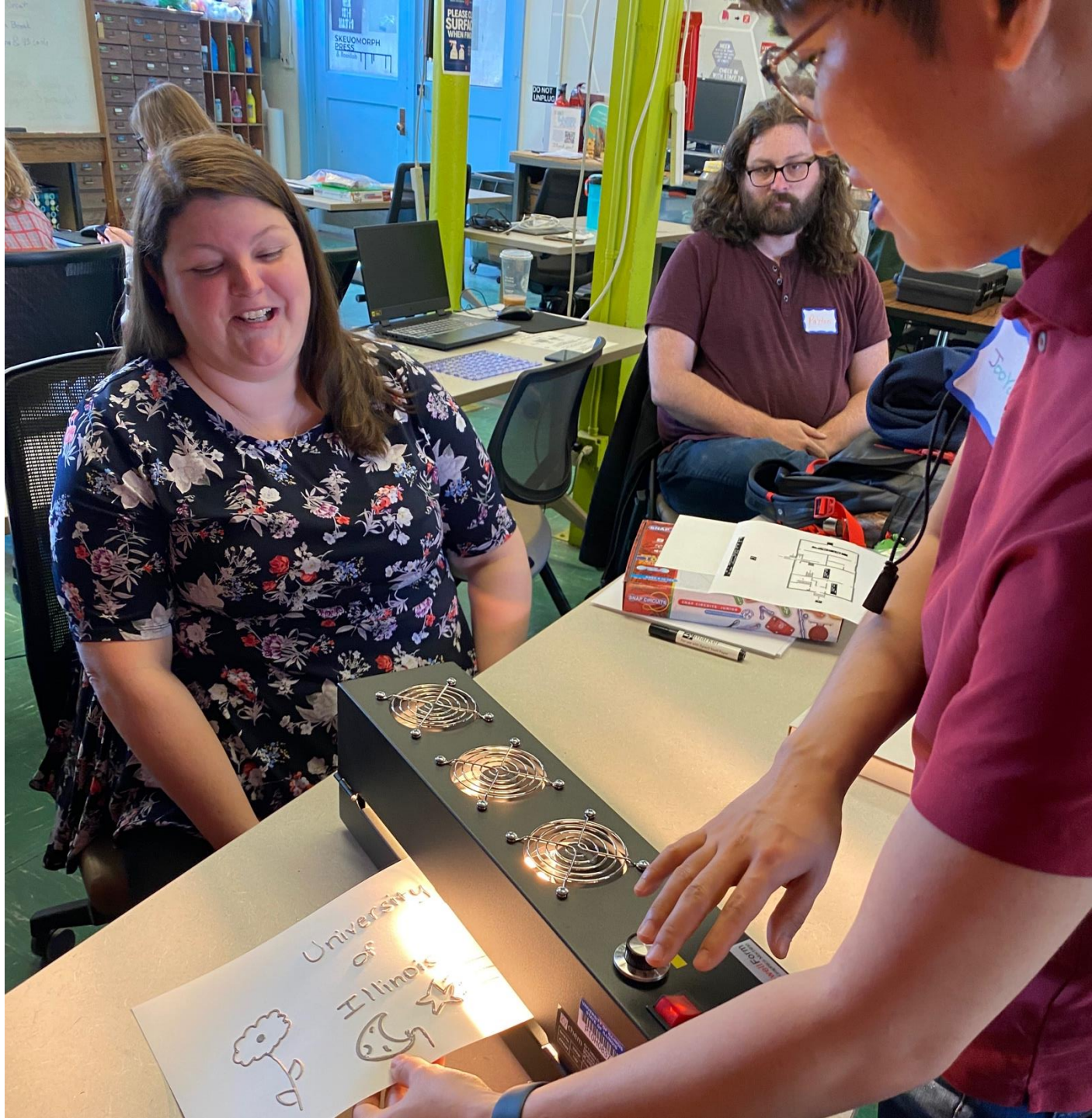
- Tactile pods that represent and can change blocks of code.
- Uses Bluetooth to connect to laptop or tablet.

Data Analysis

1. Effectiveness of the tactile and multi-sensory learning tools
2. Learner confidence, autonomy, and interest
3. Instructor challenges and strategies: Verbal descriptions, adaptations, and personalized assistant

Facilitating Making for BVI Learners: Suggestions for Librarians

- Provide detailed, specific verbal descriptions with tactile cues.
- Use tactile materials to minimize audio/verbal overload.
- Recognize diverse BVI learner needs and offer personalized support.



Research Approaches to Highlight

Navigating Recruitment Challenges

University’s Role in Innovation & Dissemination

THANK YOU!

Questions or Comments?

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