

## INTRODUCTION

- Americans, on average, spend 90% of their time indoors, highlighting the importance of human-building interaction.
- Previous research has shown positive human association with natural elements in indoor environments.
- By analyzing human interactions and physiological conditions associated with specific indoor environments, it is possible to discover ways to build responsive workspaces that alter based on users' needs.

## OBJECTIVE

- Dr. Bercerik-Gerber's research** at i-lab focuses on studying human-building interaction with user-centered environments.
- Vital Impact:** Human-centered, responsive buildings can address user's needs in numerous environments, such as office spaces and hospitals.



Figure 1: shows a user centered environment for therapy | (pc: Professor Becerik)

- Objective of experiment:** to analyze how biophilic (nature) elements in an indoor environment affect a person's physiological conditions and stress recovery.
- Significance:** The outcomes of this study can lead to an increasing incorporation of nature elements into workspaces, contributing to the development of user-centered environments.

## EXPERIMENT

We constructed a research experiment to analyze how visual stimulus containing nature affects a person's physiological conditions and stress recovery.

**Software Used:** PsychoPy **Num. of Participants:** 8

**Two conditions:** 1) Visual stimulus w/ nature  
2) Blank Visual stimulus w/o nature

- Baseline Phase:** measured the baseline physiological condition of participants

- Stressor Phase:** participants completed two stress induction tasks: the stroop test and arithmetic speed drill

- Recovery Phase:** Four participants were assigned to the blank screen, the other four were assigned to a screen with lavender field scenes

START

Prep	2 min
Baseline	5 min
Stressor	6 min



End

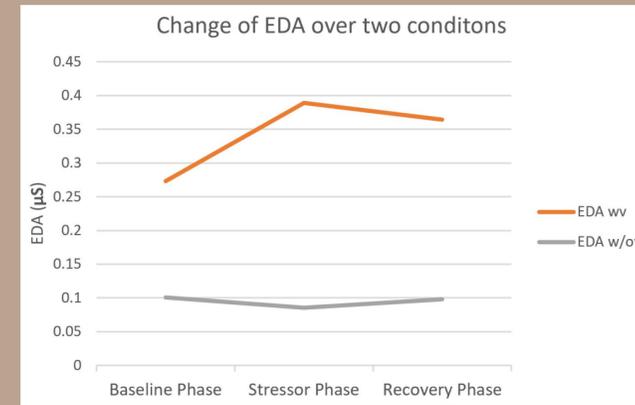


★ EDA measured with E4 wristband

## NEXT STEPS

- Continue** to challenge myself with difficult courses to explore the various fields in STEM
- Utilize** my skills to engineer programs, systems, and devices to make an impact in people's lives
- Advice for future SHINE students:**
  - continue to expand out of the STEM boundaries and to pursue STEM challenges
  - avoid setting limits on what you can accomplish

## RESULTS



Our results show a **decrease** in the participants' EDA during exposure to the nature visual stimulus throughout the stress recovery phase.

On the contrary, our results show an **increase** in the participants EDA during an absence of the nature visual stimulus.

## STEM COURSEWORK

- The SHINE research and guest speaker panels that I participated in have broadened my STEM vision and understanding.
- I will be able to bring the skills I learned in SHINE to my school community.
- I will continue to challenge myself with difficult courses and stay updated with current research with my skills in reading research papers.
- I will use my learned research, data collection, and programming skills to build human-centered projects to improve human lives.

## ACKNOWLEDGEMENTS

I would like to express my earnest gratitude and appreciation to the following people, all of whom made my SHINE experience possible...  
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...to the **Leitch Family, Dr. Mills, USC NAI, centor mentor Marcus Gutierrez, SHINE staff and students** for providing an amazing SHINE experience

## SKILLS

- Technical:** Utilization and creation of an experiment using **PsychoPy**
- Research:** Organizing planning, and scheduling an experiment
- Analyzing acquired statistics/data
- Communication:** Research participation interaction
- Contribution:** teach high school students about the process of research