HUMAN COMPUTER INTERACTION
PROJECT PRESENTATION #2

Smart Multi-Monitor Gaze Detection

Project Contributors (Group 17):-

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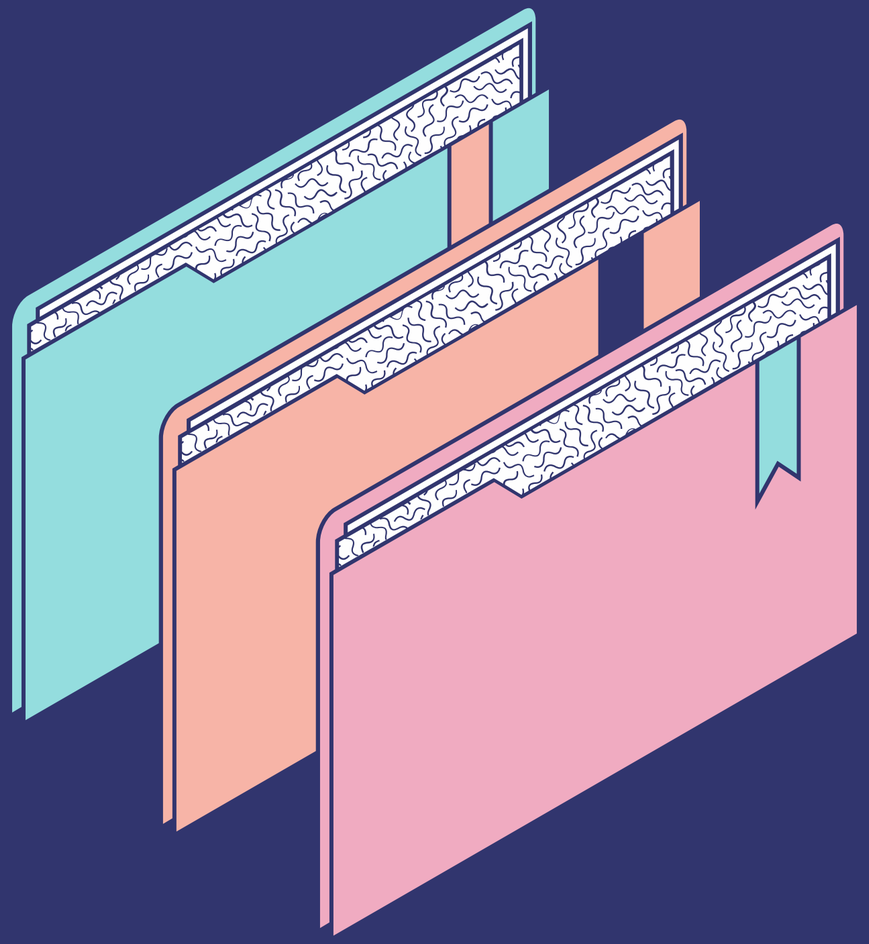
Problem Statement

- Improving efficiency and productivity, manage active windows in multiple-monitor Computer Setups.
- Perform Keyboard and Mouse Operations using Eye-Tracking functionality.

Functionalities Available:

ALT+W	**ALT+S**	**ALT+A**	**ALT+Z**	
Activate Window Relocation	Activate Active-Window Resizing	Activate Eye-Scrolling	Change Active Window	Desktop-Shift is Always on

GitHub Repository: https://github.com/YKhanna2003/G17-HCI-Multi-Monitor-Application



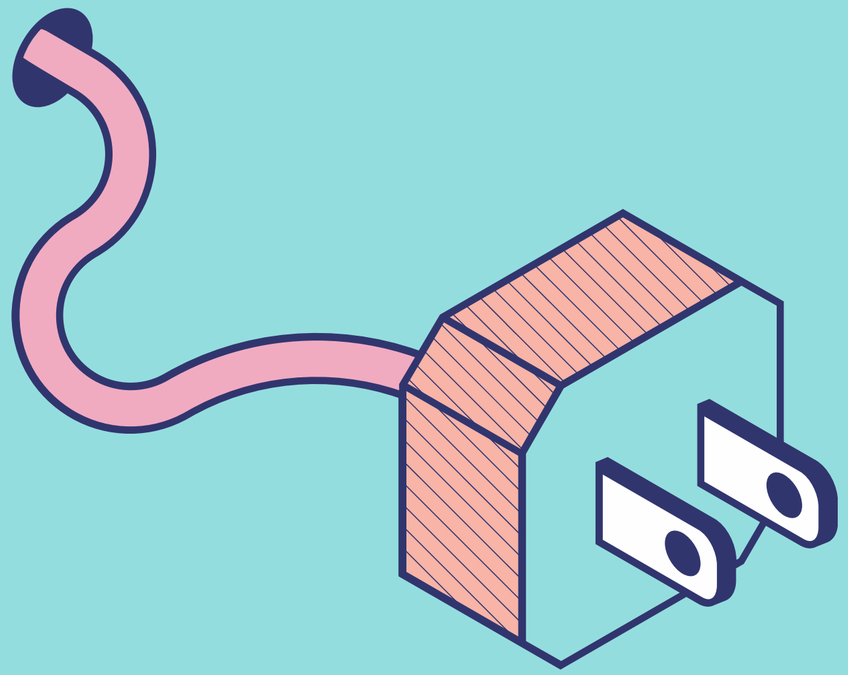
Objective and Solution:

TOGGLE ACTIVE WINDOW IN MULTI-MONITOR/MULTI-SCREEN ENVIRONMENTS USING GAZE TRACKING

- Building Functionality toggled by a hotkey to switch active windows using eye tracking.
- Applicable for both Single and Multi-Monitor Computer Setups.
- Reduce time spent switching active windows and spend more time on your work boosting productivity.

SCROLLING MODE WHILE READING

- Functionality to scroll using eye movement.
- Applicable for both Single and Multi-Monitor Setups.



User Study and Evaluation

- Users were told to fill in the form and then test the software on our local machines and evaluate the performance and user experience.
- The age group of users taking the study lies in the range of 15-20 years.
- **Project Setup and Evaluation:**

  (1-5, 1- Strongly Disagree, 5 - Strongly Agree)

  Calibration and Setup:- 4.042 on a scale of 1-5

  Learnability:- 4.083 on a scale of 1-5

  Expected Productivity:- 4.042 on a scale of 1-5

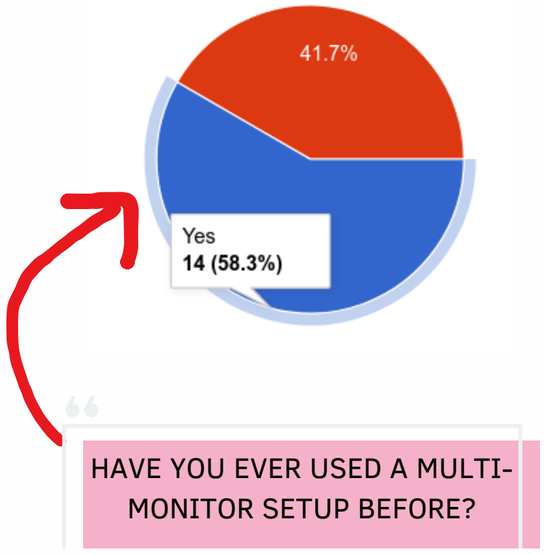
  Shift from Mouse to Software:- 3.625 on a scale of 1-5

  Comfortability:- 2.29 on a scale of 1-5 (Negative)

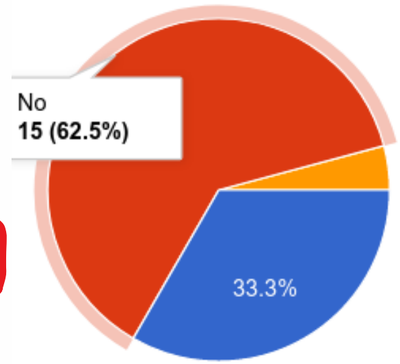
Form: https://forms.gle/Lymkn98u4kJYexa66

Evaluation Document: https://docs.google.com/document/d/1j21q3mi2ryR1QHA0e3XPB-KVJ2o7a0VPtNMpmr009Oo/edit?usp=sharing

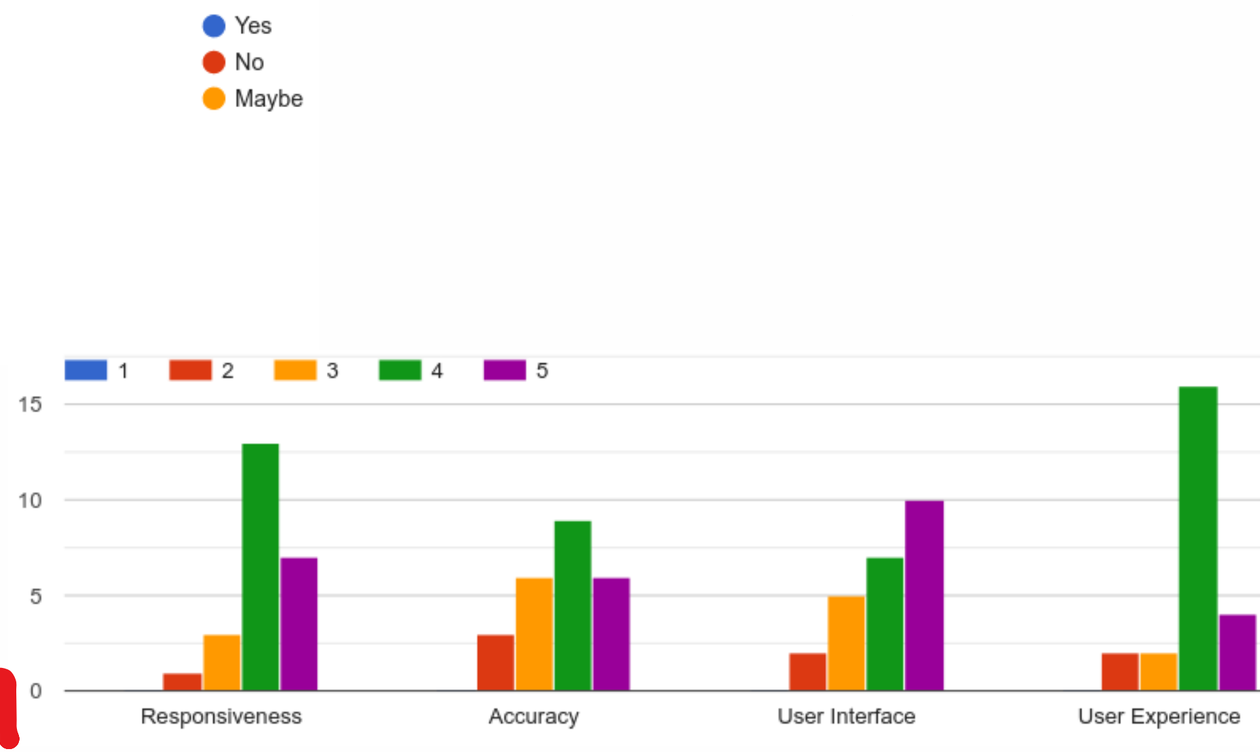
User Responses and Performance Measure Graphs



HAVE YOU EVER USED A MULTI-MONITOR SETUP BEFORE?

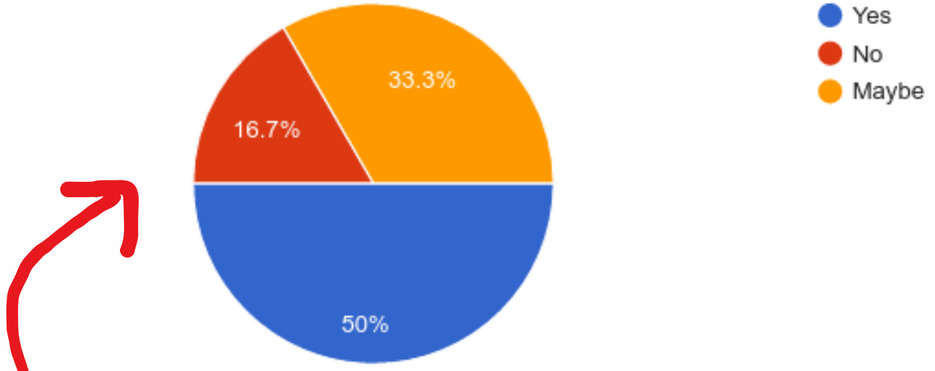


HAVE YOU EVER USED A GAZE DETECTION SYSTEM BEFORE?

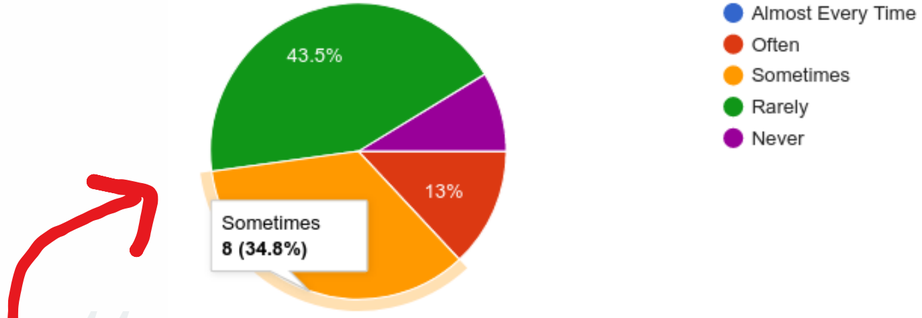


PLEASE RATE EACH OF THE FOLLOWING ASPECTS OF THE EYE TRACKING SYSTEM ON A SCALE OF 1-5. (1 = VERY POOR, 5 = VERY GOOD)

Some Graphs



THE HOTKEY CHOSEN WILL FIT INTO MY WORK-STYLE.



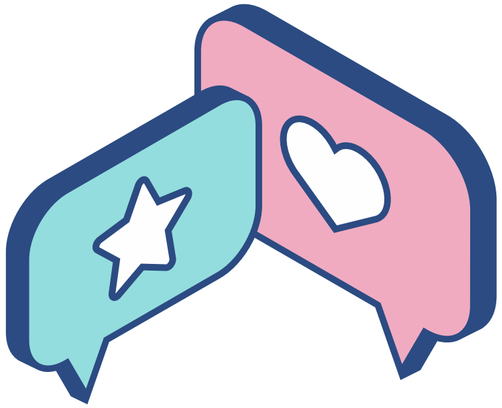
HOW FREQUENTLY DID YOU EXPERIENCE ERRORS OR MISINTERPRETATIONS WHEN USING THE EYE TRACKING SYSTEM?

Conclusions

An application that lets users use eye coordination to shift tabs and work on multiple monitors without physically taking the cursor.

Learnings and Benefits

- **Accessibility:** Users with motor and limited vision capabilities limitations who have trouble using a mouse or keyboard may benefit from the application's improved accessibility.
- **Efficiency:** Using eye tracking can be more efficient than using a mouse or keyboard. Eyes move quickly to the desired location on the screen, which can save time and reduce fatigue.
- **User Experience:** It helps create a more natural and intuitive interaction with the computer.



Limitations

- **Privacy concerns:** The use of eye tracking technology raises privacy concerns, as it involves collecting biometric data from users.
- **Accuracy and calibration:** The accuracy of the eye-tracking system is critical for the success of the application. It is necessary to calibrate accurately in different lighting conditions and positions.
- **User training:** The application requires some training and understanding for users to get understand the eye-tracking system and learn to perform actions like window scrolling and window relocation using their eyes. Better UI/UX is needed.

Scope of Improvement

- **UI/UX can be improved**
- **Training Modules can be made**
- **ML Models can be employed for calibration**

Thank You

Any Questions?

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