Understand User Behaviour Patterns Through Website Navigation Using Eye and Mouse Trackers .

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Abstract

In this day and age, websites serve as the primary front for interaction between service and products with customers or users. On focus in this particular project, university websites serve as vital gateways to information and services for students, faculty, and the wider community. Understanding user activity on these websites is vital for optimizing user experience and accomplishing institutional goals. This study utilises a multidisciplinary approach, combining eye-gaze tracking, mouse tracking, insights from neuroscience, and cognitive skills research to delve deep into the intricacies of user behaviour on a university website.

The development of online education and the omnipresence of websites need a complete investigation of user behaviour. The current research attempts to identify not only how users traverse university websites but also the underlying neurological and cognitive factors that drive their activities. By merging neuroscientific concepts and cognitive ability evaluations, this study intends to provide a comprehensive picture of user behaviour, giving light on how to create more user-friendly websites and improve the user experience. The experiment was conducted on students who had accessed the website earlier, and the rest of the sample set was comprised by outsiders who were not familiar with the website and were using It for the first time. The algorithms used were python based and worked on tracking the gaze of the eye, as well as for tracking mouse and pointer position.

Eye-gaze tracking technology is a non-invasive tool that monitors the visual attention of visitors when they interact with a website. This technique provides vital insights into what parts grab users' attention, how they read and process information, and the cognitive burden associated with particular website features. By monitoring gaze patterns, we can discover what attracts visitors' interest and highlight sections of a website that may need improvement.

Complementing eye-gaze monitoring, mouse tracking allows us to monitor the fine-grained movements and interactions of the mouse cursor, representing the decision-making process of users. The combination of eye-gaze and mouse tracking data offers a more full knowledge of user behaviour, as it captures both visual attention and manual activities on the page. Additionally, mouse tracking provides insights into the time spent on different website elements, the effectiveness of navigation, and the frequency of cognitive dissonance when users meet design or content inconsistencies.

Furthermore, the study uses ideas from neuroscience to clarify the brain basis of user behaviour.

Neuroscience has revealed that users' cognitive processes, including as working memory, executive functions, and attentional control, have a key influence in how people perceive and interact with websites. Through cognitive neuroscience methodologies, we intend to examine how the structure and function of the brain connect to user behaviour, including the ability to absorb information, make judgements, and successfully perform tasks on a university website.

Cognitive talents, comprising a range of mental processes such as remembering, problem-solving, and decision-making, are intimately connected to user behaviour on websites. To examine these relationships, the test subjects were observed on how they choose to tackle a particular navigation system on the university website. By observing the way the user chooses to navigate along with eye-gaze and mouse tracking data, we can detect how individual variances in cognitive skills influence users' interaction with the website. This insight may lead to tailored design recommendations, customising the website to individual cognitive profiles.

The study will adopt a mixed-methods research methodology, integrating quantitative data collecting with qualitative user feedback. Participants are picked from the university community and observed as they execute

tasks on the university website. Eye-gaze and mouse tracking will record the participants' interactions, while cognitive ability and navigation notes are collected simultaneously when the experiment is being conducted.

Key variables for analysis will include the total duration of navigation, position from eye-gaze data, cursor trajectories and movement patterns from mouse tracking. The study will use statistical approaches involving graphs to analyse the correlations between these variables. Qualitative input will be obtained through observation notes as well as an entry survey which takes place before the experiment begins.

The outcomes of this study are predicted to have a substantial impact on website design, both within the context of higher education and beyond. By uncovering the intricate links between user behaviour, cognitive abilities, and neurological processes, we may generate evidence-based design recommendations that enhance the entire user experience. Improved website design not only aids the university in attaining its goals but also adds to a more inclusive and accessible online environment for all users.

This study project aims to combine eye-gaze tracking, mouse tracking, neuroscience, and

cognitive ability evaluations to explore the complicated link between user activity on a university website and cognitive and brain processes. By completely comprehending these relationships, we can pave the road for user-cantered website design, ensuring that university websites properly serve their diverse user base. This interdisciplinary approach bridges the gap between technology and human cognition, enhancing our knowledge of user behaviour and website usability in the digital age.