



Abschlussvortrag Masterarbeit Harpreet Kaur

„Inclusive CAPTCHA Design: Empowering Dyslexic Users“

Captchas are one of the most common security measures to determine whether a user is a human or a robot on an online platform. This thesis mainly focuses on developing a special kind of Captcha solution, known as Captchalexia, designed especially for dyslexic users between the ages of 13 and 16. Dyslexia, a specific learning difficulty affecting reading and writing, poses significant challenges for individuals in traditional educational settings. The objective was to investigate whether Captcha's design inclusively empowers dyslexic users. In this study, I first see different types of commonly used Captchas. Then, from those widely used captchas, a game called a Captchalexia game is designed with real-world scenarios and five domains of captchas to see if it is helpful for dyslexic users or not. This thesis aims to enhance the accessibility and usability of captcha mechanisms for dyslexic students, thereby addressing the cognitive challenges they encounter when processing and completing traditional text-based captchas. Moreover, Captchalexia is further integrated with two of the most common LLMs, Google Gemini and GPT4, to improve user experience with text-based Captchas. With this integration, this thesis involves 20 Captcha tests with both LLMs across multiple trials, focusing on accuracy. Findings from preliminary testing demonstrate that Captchalexia enhances accessibility by reducing cognitive load, decreasing the number of attempts needed, and improving response accuracy. The results highlight the potential for AI-driven CAPTCHA systems to create a more inclusive web experience for individuals with dyslexia. Future work will explore expanding the system's functionality to incorporate multimodal CAPTCHAs and further improve accessibility for other cognitive and visual impairments.

Betreuer der Arbeit: Prof. Dr. Mohammad Ghafari, Prof. Dr. Rüdiger Ehlers

Datum: Montag, 30. September 2024, 09:00 Uhr

Ort: Online-Meeting über BBB

Link: <https://webconf.tu-clausthal.de/rooms/u7e-nfs-sz1-afm/join>