Abstract

Undergraduate students' intellectual and emotional health are significantly impacted by mentoring. Having the proper mentor can have a big impact on confidence, motivation, and long-term goal setting for computer science students, who frequently deal with high levels of academic pressure and ambiguity about their career trajectory. Nevertheless, conventional mentor selection techniques fail to consider students' psychological fit with mentors, which frequently leads to unproductive or brief mentor-mentee relationships. By using a machine learning-based recommendation system that takes psychological characteristics into account when choosing mentors, this study seeks to close that gap.

Using well-known models like the Big Five Personality Traits and emotional intelligence scores, the suggested system integrates psychological profiling. In addition to academic and technical interests, mentors and students are assessed on their motivational tendencies, communication preferences, and interpersonal styles. The methodology guarantees improved emotional alignment and communicative resonance between the mentor and mentee by including psychological elements in addition to scholastic data.

The model was constructed and trained using machine learning strategies, such as collaborative filtering and clustering. A psychological compatibility score was incorporated into the recommendation algorithm, and participant surveys and psychometric testing were used to create a rich dataset. According to tests, students who were paired with mentors based on psychological compatibility expressed greater levels of happiness as well as a more robust sense of belonging and support.

The study also looked at the relationship between mentor-mentee psychological compatibility and stress levels, academic engagement, and self-efficacy. Pupils who had mentors who shared their psychological views demonstrated better coping strategies, more academic perseverance, and more clarity when establishing their career and personal objectives. When mentees were emotionally open and compatible with their mentoring approach, mentors found it simpler to offer advice.

An innovative, human-centred method of academic support is introduced by incorporating psychological concepts into a machine learning-based mentor selection system. This method meets students' emotional and cognitive demands while also enhancing the caliber of mentoring relationships. Future studies will examine adaptive learning platforms that modify mentor recommendations in response to students' academic and psychological development.