

ABSTRACT

Final-year university students are vulnerable to academic anxiety due to the pressure of completing their final projects, undergoing supervision, making repeated revisions, meeting graduation requirements, and facing uncertainty about their future. Anxiety that is not identified and managed early may develop into depression and negatively affect concentration, learning motivation, sleep patterns, and the ability to complete academic tasks. This study aims to develop an early detection system for classifying anxiety levels among final-year university students by integrating eye-movement data with the Hamilton Anxiety Rating Scale (HARS). Objective data are collected using the Tobii Eye Tracker 5 in the form of gaze coordinates and eye-movement patterns, while HARS scores are used as the reference for determining anxiety classes. The classification process employs a first-order Takagi–Sugeno–Kang Adaptive Neuro-Fuzzy Inference System (ANFIS), with fuzzy rules generated through grid partitioning. Anxiety levels are classified into three categories: no anxiety, mild anxiety, and moderate anxiety. Heatmaps are used as supporting visual analyses to illustrate the distribution of participants' visual attention but are not included as input features in the ANFIS model. The system's performance will be evaluated to determine its ability to classify anxiety levels based on eye-movement patterns. This study is expected to provide a more objective method for anxiety detection and support counselling services in providing earlier interventions for students experiencing academic anxiety.

Keywords: academic anxiety, Adaptive Neuro-Fuzzy Inference System, eye tracking, final-year university students, Hamilton Anxiety Rating Scale.