Feature Visualization and Attribution Analysis of Confusion for Massive Open Online Course

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Abstract

Thousands of learners are taking massive Open Online courses (MOOCs) in search of self-improvement opportunities. However, the learning process often involves a struggle with confusion, which can adversely affect the course participation experience, leading to dropout halfway through. At the same time, it is impossible for the instructors to recognize and respond "confusion" posts accurately and timely, due to the large volume of registrants. This study aims to develop a robust and interpretable NLP model to identify "confusion" posts that require instructors' immediate attention and to dig deeper into the origin causes of confusion posts according to the type of confusion. We find that posts identified as "confusion" are manifestations of different learner affects pertaining to their informational needs–primarily related to cognitive and social processes. Furthermore, we evaluated the model with a 13% improvement in F1 value compared to previous studies and successfully applied it across unseen domains.

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