

Doctoral Seminar Presentation

Topic: Open-ended Question Evaluation System using Transformers

Personal Introduction:

My name is Burak KESKİN, and I am a doctoral student at Akdeniz University. I completed my undergraduate degree in Mechatronics Engineering at Turkish Air Force University with a 75% scholarship and my master's degree in Computer Engineering at Akdeniz University. Currently, I am serving as a research assistant in the Department of Software Engineering at Antalya Belek University. Under the supervision of Prof. Dr. Melih GÜNAY, I am conducting research in the field of natural language processing(NLP).

Seminar Topic and Objective:

The topic of this seminar is “Open-ended Question Evaluation System using Transformers”. The objective of this seminar is to explore and compare the effectiveness of various machine learning models, including Roberta, Bert, DistilBert, and T5, in accurately grading student responses. We aim to identify which model aligns most closely with human grading practices across different scoring ranges, with a focus on ensuring consistency, reliability, and the ability to accurately evaluate high-performing students. Through this analysis, we seek to inform educators and technologists about the strengths and limitations of each model, thereby aiding in the selection of the most appropriate machine learning approach for educational assessment purposes.

Research Methods:

In our research, we conducted a quantitative analysis using data mining techniques and statistical methods to evaluate and compare the performance of various advanced machine learning models, specifically Roberta, Bert, DistilBert, and T5, in the context of grading student responses. We applied Pearson correlation coefficients to measure the relationship between the scores assigned by human graders and the scores predicted by each model. Additionally, we computed mean absolute differences to quantify the average deviation of model scores from human scores, and we analyzed the standard deviation of the scores for each model to assess their consistency. These methods were chosen because they provide a robust framework for evaluating the accuracy and reliability of automated grading systems, and they are particularly well-suited to answer our research questions regarding which model most closely aligns with human grading practices across a range of performance levels.

Expected Results and Contributions:

In this seminar, we will discuss the findings from a comparative analysis of various machine learning models used for grading student answers. The expected results include a range of correlations between human scores and machine scores, differences in the average deviation of scores from human-assigned grades, and the variability in grading across different scoring ranges. Our research is expected to contribute to the field of educational technology by providing insights into the performance of automated grading systems, particularly in terms of their alignment with human grading standards. Practically, it may inform educators and institutions on the potential integration of AI in assessment practices, enhancing efficiency while maintaining grading accuracy. Additionally, the outcomes of this study could be

instrumental in the development of more sophisticated models that can mimic human grading with higher fidelity, ultimately supporting the goal of implementing reliable and fair automated grading systems

Conclusion:

To conclude the seminar, we will reflect on the implications of our findings for the future of educational assessments and the role of AI in supporting fair and accurate grading. We will discuss the potential for integrating these AI models into actual grading systems, the ethical considerations involved, and the necessary steps to ensure that such technology augments the educational process without introducing bias.

Contact Information:

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Sincerely,

Burak KESKİN

Akdeniz University