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Leveraging Deep Learning for Speciality Recommendation in Higher Education: An AI-Driven Approach

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Abstract – In an increasingly complex educational environment, choosing a concentration that aligns with one's talents and interests for academic success is essential. This study introduces a novel recommender system based on deep learning that assists students in selecting their Computer Science master's concentration. Utilizing a robust dataset of student performance from the second to the fifth year, the system optimizes data quality through extensive data preprocessing and feature engineering. The model captures intricate relationships between performance in specific modules and success in chosen specialties by employing cutting-edge deep learning techniques. The model was subjected to systematic training, optimization, and evaluation, resulting in impressive precision and recall metrics. The initial implementation of the model has proven effective in providing accurate and personalized recommendations for specializations, thereby facilitating students' decision-making process. Future research directions include expanding the system's predictive capabilities to encompass additional aspects of academic success. This study highlights the potential of deep learning for individualizing educational guidance and enhancing student achievement in higher education.

Keywords –Deep Learning, Recommender System, Computer Science, Master's Speciality, Data Preprocessing, Feature Engineering, Student Performance, Personalized Recommendations, Academic Success, Higher Education.