Innovating Computer Science Education: Adaptive Learning Systems and Practical AI Applications Bridging Theory and Student-Centered Practice

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Abstract:

This paper explores the integration of adaptive educational systems with practical applications of Artificial Intelligence (AI) to enhance computer science learning, aiming to bridge the gap between theoretical models and student-centered practice. The primary objective is to improve interactivity, personalization, and overall learning efficiency in technical disciplines. To achieve this, a mixed-method approach was adopted, combining a comprehensive review of existing adaptive learning frameworks with an analysis of AI tools frequently used by students, including intelligent tutoring systems, generative models, and conversational agents. The findings reveal that integrating AI applications into adaptive systems significantly increases student engagement and autonomy. By bridging theory and practice, this approach offers a pathway toward innovative, student-centered education in the field of computer science.

Keywords:

Adaptive Learning Systems, Artificial Intelligence, Computer Science Education, Personalized Learning, Student-Centered Approaches.