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Pseduo Code Visualization and Interactive Learning System

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Abstract:

Data structures and algorithms are important foundation subjects in computer science. However, the abstract and rigorous nature of the discipline makes students shun them. Teaching the subject with visualizations (through slides, videos) has helped. However, much remains to be desired. First, the available visualization material is scarce, and most of them are merely duplicates. Due to this scarcity, students lack exposure to delicate parts of concepts, and are unable to reason well in the subject. Hence, we propose a system to automatically generate visualizations of an algorithm at work. Our system will not be specific to any algorithm, and will accommodate many problem classes, e.g. graph-theoretic etc. The system will help students in three ways. First, students can watch the workings of algorithms, animated, for as many examples as theoretically possible. Second, through changing the algorithm or the input interactively, students can examine the delicate aspects of the algorithm. Step-wise interaction will allow animations to be presented at a pace that is more suited to each student's ability or inclination. Finally, the system will encourage students to explore new ideas and algorithms, by providing a user-friendly platform that is usable even without programming skills. Learning algorithms will finally become enjoyable.