The paper titled "Extracting Features for Computational Thinking from Block-Based Code" by Param Damle and Glen Bull from the University of Virginia[1] proposes an automated evaluator (autograder) for Snap!, a block-based programming language. The autograder is designed to support undertrained instructors in introductory computer science classes. The novelty of this approach lies in its ability to work natively on a non-textual language and assess the computational thinking (CT) reflected in the structure of a student's submission rather than the accuracy or run-time of its execution[1].

The autograder assesses demonstrated knowledge of abstraction and iteration from an XML tree representation of a student's Snap! program[1]. The authors explore how to tailor feature extraction to capture specific CT elements, including consecutive repetition and encapsulation of functional blocks[1]. They also discuss the challenges of clustering trees with similar structures together and the limitations of methods such as path matching[1].

The paper presents both successful and unsuccessful endeavors to inform replications of this work[1]. It also highlights avenues for feature tuning and scalability of the autograding model to larger, more diverse classrooms[1]. Unlike proprietary autograders, their approach integrates the academic community into the research and development of the optimal feature embedding of Snap! Programs[1].

Source: Conversation with Copilot, 5/24/2024
(1) Extracting Features for Computational Thinking from Block-Based Code. https://www.kdd.org/kdd2023/wp-content/uploads/2023/08/damle2023extracting.pdf.
(2) KDD '23: Proceedings of the 29th ACM SIGKDD Conference on Knowledge .... https://www.kdd.org/kdd2023/wp-content/uploads/2023/08/toc.html.
(3) Sensor Placement for Learning on Networks - kdd.org. https://www.kdd.org/kdd2023/wp-content/uploads/2023/08/burudgunte2023sensor.pdf.
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