

ABSTRACT

A Tool to Assist Novice Programmers to Visualize Pseudocode

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Programming novices are having difficulties learning how to program. They are challenged with understanding fundamental programming concepts and using them appropriately to solve algorithmic problems. Programming concepts are highly abstract in nature and require abstract thinking. However, many novices do not think abstractly and this inability to think abstractly has contributed to the storage of non-viable mental models of programming concepts.

In order to assist novices in developing viable mental models of programming concepts, many educators and researchers have resorted to the use and creation of visualisation tools. Visualisation tools can be pedagogically effective, however, the majority of them are found lacking as they require the novice to learn a standard programming language in order to use the tool and/or do not allow for active engagement by users.

PseudoCAS is a visualisation tool that actively engages novices in the construction of pseudocodes that are executable. However, unlike many visualisation tools PseudoCAS does not require the novice to learn the syntax and structure of a standard programming language or a pseudocode-specific language. Pseudocode statements are automatically generated once valid data has been entered for key components. It currently focuses on the use of fundamental programming concepts such as, assignments, simple sequencing, selection and looping. Each of these statements has its own set of attributes (key components) that is common to any standard programming or algorithm language.

The executable nature of PseudoCAS is an advantage to novices as it provides a more efficient means of validating and debugging their solutions. The executable output is an animation of text-breakdown and real-life visual metaphors. Execution can be done during or after algorithm generation.

In the near future, PseudoCAS will be assessed by experts and novices to determine its pedagogical effectiveness. Modifications will then be made to enhance its effectiveness.

Keywords: Careene Stacian Rodney; PseudoCAS; Algorithm Visualization; Novice programmers.