



Design and Analysis of a Visual Programming Language for Microcontroller Systems

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Abstract

Conventional methods of programming microcontrollers using textual languages are hard to learn and are daunting to novice programmers seeking to learn microcontroller programming. Visual languages have always been regarded as a useful tool in helping non-programmers and novice-programmers to write programs. However there have been limited attempts at creating a visual language for microcontroller systems and there isn't a visual language for microcontrollers that is flexible and easy to use. This thesis presents a way of addressing the issue by creating a low level visual programming language for microcontroller systems. The low level visual programming language aims to alleviate the problem by using a fine grained language to improved flexibility and providing an integrated visual language environment in which users can focus on writing programs and solving problems.

A visual language environment called CoreChart was developed for this purpose. CoreChart aims to simplify the process of programming microcontrollers by providing users with a tool to construct assembly programs visually. The visual language will utilize flow chart diagramming techniques to present users with a more meaningful view of the program. This allows users to focus on writing programs to solve problems, rather than on the rules and syntax of the language. The procedure of programming microcontrollers is further simplified by automating the task of compiling the program and downloading the program into the microcontroller. A survey was conducted on university and high school students to evaluate the effectiveness of CoreChart.

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