

TRINITY COLLEGE DUBLIN

Abstract

Animation of Register Allocation via Graph Colouring

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Register allocation is taught in a compiler design module in Trinity College Dublin. The objective of this dissertation was to create an animation of register allocation using the approach of graph colouring. The motivation for this work was to assist students of the compiler design module with understanding this concept. The animation was created using Vivio which is a tool for creating E-Learning animations and was developed in Trinity College Dublin. Vivio allows the user to control all aspects of the animation, meaning they can proceed at their own pace. Each of the steps of the process of register allocation by way of graph colouring is demonstrated on screen in the form of an animation. Each of these stages is fully implemented in the underlying application. A study was conducted to evaluate the performance of the application with regard to educating students on the subject. The study included thirteen participants with different levels of knowledge on the topic. The study produced interesting results, showing an increase in the students' perception of their own knowledge on the subject after viewing the animation. This project has paved the way for future work to be done on similar animations. Depicting the process of register allocation via graph colouring as an animation, can aid the users in understanding the subject meaning more animations could prove useful. The application has been completed and will be employed in the next semester of compiler design in Trinity College Dublin.