

Initial Plan

ConceptTop - Concept Map Based Desktop

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Project Description

The goal of my project is to create a document management system using concept maps. This will be presented using three-dimensional rendering to the user, who will also be able to navigate and alter the concept map.

Concept maps are graph-like structures where each edge not only connects two nodes but also describes the relationship between them. In the graph used by the project, each node will represent a document, with the edges describing the connections between two documents. The program will allow the user to create nodes and edges as well as group nodes into subsets which can then be expanded and collapsed as required, similar to folders in a traditional document manager. It is possible that hyper-edges may be explored as a means of achieving folder functionality. Hyper-edges are similar to normal edges in a graph however they may join any number of nodes rather than just two. Whether or not this approach is appropriate will be explored during the course of the project.

I will choose a programming language that is used across various platforms and operating systems, a successful language will be more widely documented and therefore easier to use. I will also aim to select a language that I have a fair amount of experience with so that my progress is not held back having to learn a language. OpenGL is a cross platform graphics library with many different language bindings. It is the hardware level API used by Linux. Although working directly with OpenGL is an option for my project, there are many libraries that can be used on top of the OpenGL API that aim to reduce some of the basic operations needed to accomplish common tasks. I have not yet decided which library, if any to use for my project.

One of the main elements of the program will be the user interface, this will provide ways to add documents to the concept map, such as importing a directory and its documents or by individually selecting items for use in the concept-map. The user can then create links between the documents that will act as the edges of the graph. These will describe the relations between them, and will not create any technical connection between the items on the hard disk.

Throughout my project I will take time to continually evaluate the effectiveness of the program as a means of managing documents on a computer system. I will make minor adjustments during the implementation to ensure that I am working along the right lines. At the end of the project I will carry out a proper evaluation including asking others to use the program. I will ask several people to test the software and provide a judgement as to whether or not the program is useful and in addition if they believe concept maps could be a viable method of document management.

Project Aims and Objectives

- Interim Report aims
 - Overview of all researched areas: Graphs as document managers, 3D rendering using OpenGL and Self-organising Graphs
 - Explanation of decisions made during research and early implementation
 - Initial system design
- Final Report aims
 - Extensive description of system layout and principles
 - Analysis of user interface for efficiency and ease of use
 - Description of achievements met over the course of the project
 - Assessment the viability of a concept-map style desktop environment for basic document management and interaction

- Final Deliverables
 - Creation of 3D graph editor using OpenGL and possibly an additional library
 - The software will allow the user to carry out appropriate operations on the graph, these operations will allow the user to alter and configure the concept-map and its underlying graph structure

Work Plan

Week Beginning	Task	Description
1/10/12	Initial Plan - First Draft	Analyse brief and decide on aims
8/10/12	Initial Plan - Second Draft	Consult with supervisor over plan
15/10/12	Initial Plan - Submission	Final review and submission
22/10/12	Research - Graph Structures for Documents	Look at current examples and similar programs
29/10/12	Research - 3D rendering using OpenGL	Explore libraries for easier rendering
5/11/12	Research - Self-organising graphs	Look at existing algorithms
12/11/12	Implementation - System Design	Decide on system components
19/11/12	Implementation - Underlying graph storage	Select method for storing the graph
26/11/12	Implementation - 3D rendering and Interaction	Develop prototypes within OpenGL using the chosen library, if any
3/12/12	Interim Report - First Draft	Collate research and summarize
10/12/12	Interim Report - Submission	Review and explain decisions made
17/12/12	Christmas Break - 3D rendering continued	
7/1/13	Exams	Break for revision
28/1/13	Initial Evaluation	Assess the usability of the software so far
4/2/13	Implementation - Concept map interactivity	Create the interactivity for nodes and edges within the concept map
11/2/13	Implementation - Concept map operations, add-remove documents	Create the concept map operations to allow for user editing of the graph
18/2/13	Implementation - Concept map operations, create-destroy folders	Allow for the creation of node subsets
25/2/13	Implementation - Extension aims	Attempt extensions if time permits
4/3/13	User Testing and Evaluation	Recruit others for program testing
11/3/13	User Testing and Evaluation continued	
18/3/13	Program and Design evaluation	Evaluate the program itself
25/3/13	Easter Break - Finalise evaluation	Complete the evaluation
15/4/13	Final Report - First Draft	Write up evaluation and testing
22/4/13	Final Report - Second Draft	Assess the effectiveness of the program
29/4/13	Final Report - Submission	Finalise and submit the report