

# USER GUIDE FOR GDCT

## SECTION 1: INTRODUCTION

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### About GDCT

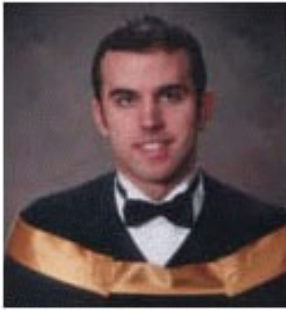
Graphical Database for Category Theory was developed in the summers of 1999, 2000, 2001 and 2002 under NSERC summer research grants. Some of the algorithms used in GDCT were originally developed in A Database of Categories, a C program written by Ryan Gunther and Michael Fleming with supervision by Robert Rosebrugh. This is available at <http://mathcs.mta.ca/research/rosebrugh/dbc/>. The GDCT application is also based on Category Theory Database Tools, a Java applet written by Jeremy Bradbury with supervision by Robert Rosebrugh. This program is available at <http://mathcs.mta.ca/research/rosebrugh/ctdt/>.

This application allows for the creation, editing, and storage of finitely presented categories. Categories can be opened and saved from local files as well as loaded from a specified server. Once a category file is in memory it can be printed or tools for testing properties of objects and arrows can be applied to it. The tools available in this version of GDCT are Make Confluent, Equality of Composites, Make Dual, Initial Object, Sum, Terminal Object, and Product.

This program also allows the display of categories through the use of graph classes that were developed at Auburn University for Visualizing Graphs with Java (VGJ), a tool for graph drawing and graph layout. The original program was heavily modified for displaying categories. It can be found at <http://www.eng.auburn.edu/department/cse/research/graphdrawing/>.

Functors between finitely presented categories can also be created and stored. Functors in memory display their domain and codomain categories, and their action is shown by an animated display.

## Development Team



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## Installation

The most current version of Graphical Database for Category is available for download at <http://mathcs.mta.ca/research/rosebrugh/gdct/downloadv20.htm>. There are three installation options. The first option is available only to Windows 95/98/NT/2000 users. Options two and three are available to users of all platforms.

### **Option One: Download Compiled Java Source Files and Java Runtime Environment [Windows Only]**

This includes compiled source files into a jar file. This setup includes a Java Runtime Environment for Windows 95/98/NT/2000 only. This version of the GDCT Setup is \*\*\* MB in size.

### **Option Two: Download Compiled Java Source Files**

The option includes the \*.jar file and sample files, but does not include the JRE. This option will most likely be used by someone who wants to install GDCT under a Linux or Macintosh environment.

Linux Instructions:

You will need the latest JRE from <http://java.sun.com>. From the command prompt type:  
"java -jar gdct.jar."

Macintosh Instructions:

You will need to get the MRJ SDK from <http://developer.apple.com/java/download.html>. Then run the program JBindery. Enter GDCT for the class name. Under the Class Path tab click "Add \*.zip" and then select gdct.jar. Then you can save as to create a double clickable file that is equivalent to a Windows \*.bat file.

### **Option Three: Download Java Source Files and Java Developer's Kit**

The complete Java source files are available for download and may be modified under the terms of the GNU General Public License, Version 2. This download also includes all necessary help files as well as sample category and functor files. It is available as a \*.zip file or as a \*.tar.gz file. In order to compile and interpret Java source files, the Java Developers Kit must be downloaded. JDKs are used by an operating system to compile Java source files and interpret Java class files so that they can be run on the local machine.

## Directory Structure

Upon installation, the Graphical Database for Category Theory, unless changed by the user, will be installed in a directory called GDCT. Inside this directory are the subdirectories `cat`, `cgl`, `fgl`, `fun`, `Help`, `Images`, and `Jre1.1`. The following files are also located inside the main directory :

- `GDCT.bat` This is the batch file that the user selects to interpret the java archive file (jar).
- `GDCT.jar` This is the java archive file that is interpreted by the Java Runtime Environment. This file contains all of the compiled Java source files.
- `GDCT.ico` This is an icon file that is used on any shortcuts to the GDCT application.
- `GDCT.ini` This initialization file contains information regarding internal settings, category graphical settings, functor graphical settings, functor animation settings, server settings, as well as a list of the most recently opened files.

The subdirectories `cat` and `cgl` contain sample category files. The subdirectories `fun` and `fgl` contain sample functor files.

The subdirectory `Help` contains all of the help files while the subdirectory `Images` contains all of the images used by the Java application.

The `Jre1.1` subdirectory contains the Java Runtime Environment Version 1.1 which is called by `GDCT.bat` to interpret `GDCT.jar`.

**WARNING:** The user should not modify any files in the subdirectories `Help` or `Images`.

