Setting Up your Working Environment

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This document gives some advice on how to get a working environment set up for an academic project in Computer Science. It outlines the various tools that make research in a group a little bit easier. If you have any questions, please discuss them with your supervisor.

Collecting Citations using BibTeX

BibTeX is the standard citation subsystem for LaTeX. It allows you to collect citations of various document types, such as conference papers, journal articles, books and technical reports. When using Google Scholar, you need to go to "Scholar Preferences" from the main page (scholar.google.com) and adjust the settings to make Google show links to BibTeX entries for each citation. The BibTex entries can be copied directly into your `.bib` file.

If you are working from home and would like to access PDFs of publications through the university library, you can use the following Google Scholar proxy server:

http://scholar.google.com.ezproxy.auckland.ac.nz

Writing your Thesis using LaTeX

The LaTeX typesetting system is a text-based compiler that reads a document description language and creates relatively nice looking documents such as PDFs. Although not always easy to use, it will help you to produce a thesis without having to worry too much about formatting issues.

If you are working on Windows, make sure your computer has the MikTeX distribution installed (www.miktex.org). MikTeX is an implementation of LaTeX specifically for Windows. The "basic MikTeX system" should be enough. There are also LaTeX distributions for other operating systems.

LaTeX is best used using a dedicated LaTeX editor, rather than just a generic text editor. For Windows, we can recommend TeXnic Center (www.texniccenter.org) or TeXMaker (www.xm1math.net/texmaker). The latter one is also available for Linux. Make sure you configure your LaTeX editor to compile your LaTeX files into the PDF format.

There is a LaTeX template for your thesis here: http://www.cs.auckland.ac.nz/~lutteroth/other.html It uses a subfolder for each chapter, where you can have a `.tex` file for the text and as many PDF, JPG and PNG files for images as you need. In the main folder, you have a `.bib` file which contains your citations. The web contains a lot of information about LaTeX, so search for it if you have technical questions.

There is a formatting rule that we use for our LaTeX documents: each sentence should be written on a separate line in the LaTeX file. This is important because the version control system we use (see section below) compares files line by line when creating new versions. With each sentence having its own line, it is much easier to keep track of changes in the text.

Managing your Files using the Mercurial Version Control System

Every one of my students gets access to Mercurial repositories, where the thesis files, publications and other documents can be stored. The Mercurial system (mercurial.selenic.com) can be used to track different versions of your files, and storing them in the repository makes sure that nothing gets lost, e.g. in case of a hardware failure. For source code, there will typically be an existing repository since most of my projects already have a code base.

If you are working on Windows, make sure the TortoiseHg system (tortoisehg.bitbucket.org) is installed on your computer (hg stands for Mercurial). This makes the Mercurial features accessible from the file browser, rather than having to use the command line. There is good documentation available on the Mercurial and the TortoiseHg webpage.

You should also install a merge tool…!!! TODO

The following Mercurial repositories are already set up for the Auckland Group projects (note that you have to replace `yourUPI` by your UPI):

```
ssh://yourUPI@genoupe.se.auckland.ac.nz//var/hg/pdstore
ssh://yourUPI@genoupe.se.auckland.ac.nz//var/hg/aim-java
ssh://yourUPI@genoupe.se.auckland.ac.nz//var/hg/haiku
ssh://yourUPI@genoupe.se.auckland.ac.nz//var/hg/publications
```

The publications repository (last one in the list above) contains a folder `current` which should contain a folder for your thesis, and a folder for every publication that you are working on.

Coding in Java using Eclipse

If you are working on a Java based project, then you need have the Eclipse IDE (www.eclipse.org)

installed on your computer. Eclipse has many features for navigating, creating, refactoring, building, debugging and testing Java code. Make sure you familiarize yourself with the common features. The web contains a lot of documentation and tutorials about Eclipse, so search for it if you have technical questions.