

NiCad

This page describes how to download, install, and use NiCad on Mac OS X

Install

Download from <http://www.txl.ca/nicaddownload.html>.

```
$ tar -zxvf NiCad-3.1.tar.gz
$ cd NiCad-3.1/
$ make
```

Now edit config file to produce html reports. Change the last line to "report = yes"

```
$ nano config/default.cfg
```

There are various other configure operations as well, below is a list of some of the more important ones and what they do.

- *threshold* - The threshold of clones to report. The smaller the threshold the more clones reported. It determines the % of line difference between the two clone pairs.
- *minsize* and *maxsize* - The min/max size of clones that are detected (in terms of line numbers).
- *report* - Make XML and HTML source reports (yes|no)

Edit the command scripts "nicad3" to use the correct system "SYS=MacOSX"

```
$ nano nicad3
```

Using

To test NiCad try within the NiCad-3.1 directory:

```
./nicad3 functions java examples/JHotDraw54b1
```

Inside the examples folder there should be a *JHotDraw54b1_functions-clones* folder.

Note: Not sure why, but on my Mac, html files refuse to be produced... but on my Ubuntu setup everything was fine.

Report

Clone detection is extremely important in eliminating software maintenance costs. Duplicate code is the number one *bad smell* for software code. Duplicate code can be injected into code for numerous reasons such as developers using copy and paste, merging similar systems, and accidentally or unknowingly implementing the same logic by different programmers. Code clones can be dangerous for many reasons:

- if bugs are found in the duplicated code the bug may only be fixed in one location
- source code can become bloated with repeated lines of code
- new features may have to be introduced into multiple files
- it becomes difficult to understand the difference between clone fragments

Because clones have the potential to be so dangerous, and thus cause software maintenance costs to sky rocket, it is important to detect and minimize clones.

NiCad is an excellent tool for clone detection. NiCad is a program, based off of TXL, that compares fragments of clones against one another and determines, based on a specified threshold, if the fragments are similar enough to be considered duplicates of one another. NiCad has different options that affect what is reported. The *config/default.cfg* file contains most of the options. Here is a list of some of the more important ones:

- *threshold* - The threshold of clones to report. The smaller the threshold the more clones reported. It determines the % of line difference between the two clone pairs.
- *minsize _and_ _maxsize* - The min/max size of clones that are detected (in terms of line numbers).

- *report* - Make XML and HTML source reports (yes or no)

NiCad's XML reports can be used by many any XML parsing program to display the results in a coherent manner. However, NiCad's most readable report is its HTML reports that are viewable by any browser. The HTML report displays things like total functions found, clone pairs found, lines of code compared, CPU time to produce the report, and the number of classes analyzed. For Team Effort's soccer system, the following results were given Total Functions: 214, Clone pairs found: 42, LCS compares: 769, CPU time: 0 min 0.100 sec, Number of classes: 10. The soccer system is a complex system that uses multiple languages such as CSS, HTML, JavaScript, JSP, and Java. Team Effort is only analyzing the code clones for the Java source code to reduce complexity. The HTML report produced by NiCad also produces the clone class number, the number of fragments that match the clone class, the size (in terms of number of lines), and the degree of similarity between the fragments, for every clone that is detected. With NiCad, Team Effort is able to determine the current clones in the software system. With the code clone information Team Effort can take measures to eliminate clones and minimize future software maintenance costs.