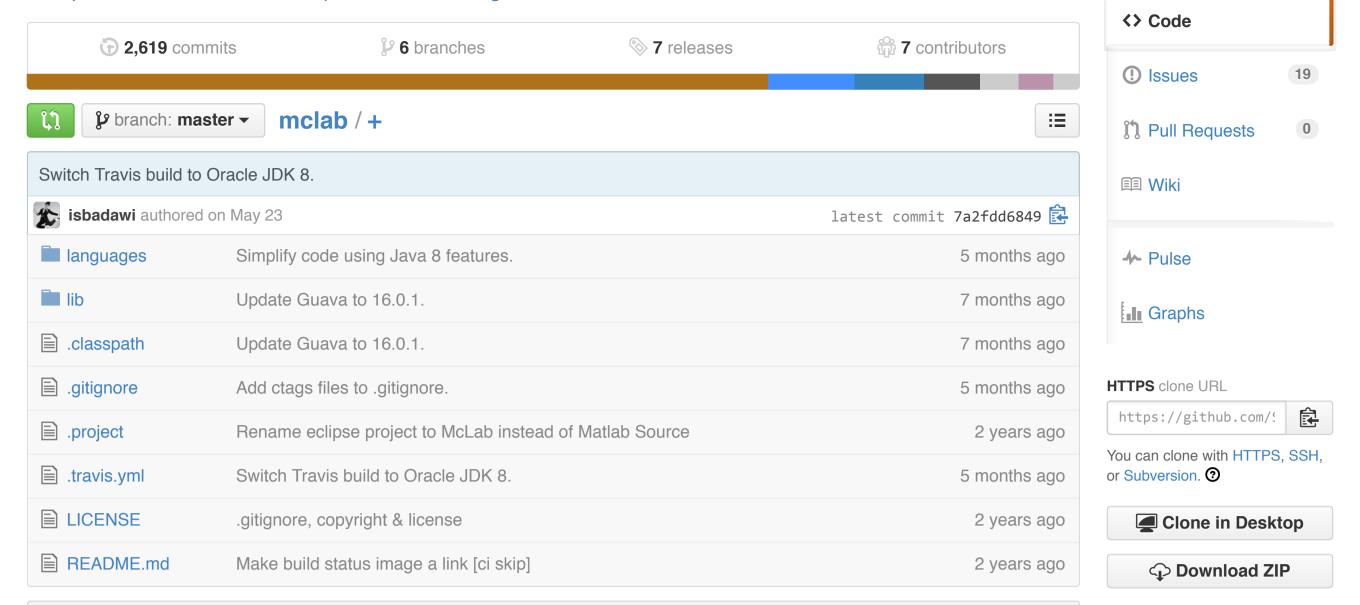


Compiler toolkit for MATLAB http://www.sable.mcgill.ca/mclab/



■ README.md

McLab/Natlab

build passing

This is the Java-based infrastructure of the McLab project, which aims to provide compiler tools and infrastructure for MATLAB (and potentially other scientific languages in the future). In practice this repository houses development for the project's "static" branch, which includes the frontend (parsing, static analysis, refactoring, etc.), and work towards static compilation. (The "dynamic" branch's McVM project will be made available soon.)

Overview

Proper developer documentation will eventually be here. A quick tour of the code:

- matlab includes the Matlab to Natlab translator. Natlab (nice Matlab) is a simplified version of Matlab that is easier to parse. (There are only syntactic differences between the two.)
- natlab includes the generated Natlab parser, as well as natlab.Main, the entry point.
 natlab.toolkits.rewrite is a simple framework for AST transformations and simplifications.
- Some useful simplifications, such as conversion to three-address code, are provided.

 natlab.toolkits.analysis is an (intraprocedural) dataflow analysis framework, and
- subpackages provide various common analyses. Of particular interest is the kind analysis, which lives in natlab.toolkits.analysis.varorfun.

 natlab.refactoring includes implementations of a few different refactorings, such as function
- and script inlining.
 natlab.tame and its subpackages comprise the tamer framework, which aims to make Matlab
- more suitable to static compilation. It provides an intermediate representation (natlab.tame.tir), machinery for analyses to handle Matlab builtins, and an interprocedural analysis framework, among other things.

 natlab.backends houses the Fortran and X10 backends. These build on top of the tamer, and
- are a work in progress.

Working with the code

There exists an eclipse project (.project , .classpath) which can be imported in eclipse.

There exist ant files (build.xml). These can either build the projects on the command line, or in eclipse (import in the ant-view) using the eclipse.* targets. The ant targets generate necessary code (like the Natlab AST). The command line ant targets also compile everything, while the eclipse targets do not -- eclipse will compile the code.

(The build process contains a lot of cruft, duplication, some things are broken, etc. There is an ongoing effort to clean it up.)

has been built with ant jar, you can run the registerMatlabPathWithNatlab.m script in Matlab; it just calls the Matlab path function and feeds its output to the jar.

It is useful for analyses to have access to the library files of a Matlab installation. After Natlab.jar

Disclaimer

Some of this code is confusing, poorly documented, and not well understood, as the grad students who wrote much of it have moved on to bigger and better things. (This is fairly typical of research software.) Most of the documentation can be found in the various McLab publications, but in many cases there are discrepancies between terminology used in papers and what's in the code. There is an ongoing effort to clean up the code and the build process, and document everything, so please bear with us as we work through this.

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