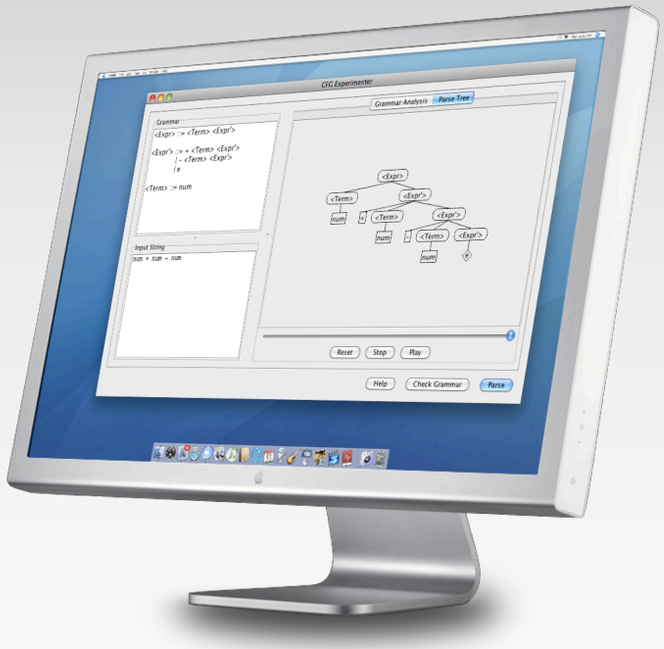
CFG Experimenter

See. Do. Learn.



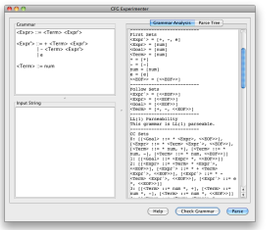
Create concrete examples from the algorithms used in parsing.
Visualize top-down and bottom-up parsing.
Internalize the algorithms by implementing them.

Algorithms Matter

Understanding the algorithms used by parser-generators is an intellectual challenge and a practical skill. From generating *nullable*, *first*, and *follow* sets, to canonical collections of *LR(1)* items and *Action* and *Goto* tables, CFG Experimenter helps students study and learn these algorithms.

Create Concrete Examples

Unlike traditional parser-generators, CFG Experimenter reports the results of each stage of its analysis. It's great for generating examples for use in class, on problem sets, and on exams.

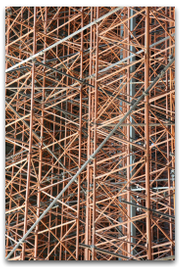


Visualize

After analyzing an input grammar, CFG Experimenter performs top-down or bottom-up parses of input strings. It animates the parse tree constructions. Students use a slider to scrub—move back and forth—through the animations, actively checking their understanding.

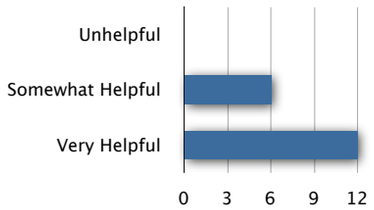
Let Them Roll Their Own

CFG Experimenter also provides the scaffolding for a student programming project. We give our students the source code for the tool, but with the code for the core algorithms removed. Students implement the algorithms as part of an intense two week project. The scaffolding gives the students the user interface and animations, so they can focus on the algorithms. JUnit tests let them check their work as they go. They can even scrub through the animations to compare their results to ours.



Promising Results

Over the last two years 18 students have used the CFG Experimenter scaffolding to implement the full set of parser-generator algorithms. On a Likert scale survey, all the students reported that the project was helpful to their "learning about parsing algorithms."



Join the Fun

The scaffolding project is freely available under an open-source license. Our project specification is also available. Instructors may request a copy of the full version of CFG Experimenter by emailing the first author. For details, see *www.rose-hulman.edu/~clifton/cfg/*

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