# Building Programatica

- Implementation of tools
- Front-end for Haskell 98

# People

- Thomas Hallgren
- Iavor Diatchki
- ...

# Previous work (before Sept 10th, 2001)

- Module system
  - Careful reading of the Module system section of the Haskell 98 report
  - Results
    - a clarification of the report
    - an implementation
- Extensible type checker for Haskell 98
- Translation of Haskell to the proof editor Alfa

# Progress since last visit (Sept 10th 2001)

- Integration of module system implementation in the front-end
- A new lexical analyzer for Haskell
- Translation of Haskell to HTML
- StripComments
- Support for P logic
- PFE - a front-end framework
- PFE Haskell Browser
- Publications

# Integration of module system implementation in the front-end

## Processing multi-module Haskell programs is now easy

- Operator precedences
- Scoping
- Type checking
- Translation to Alfa

# A new lexical analyzer for Haskell

- The old one was hand-written, clumsy and buggy.
- The new one is split into two parts
  - A lexical grammar specifications
    - A simple transliteration of the grammar in the Haskell report
  - A reusable regular expression compiler
    - Based on standard text book methods
- All implemented in Haskell 98

# Translation of Haskell to HTML

- Syntax highlighting
- Info pop-ups
- With hyperlinks to definitions
- Preserves comments and layout
  - (by using the new lexer)

# StripComments

- We released a simple tool that strips comments and white space from Haskell 98 programs
  - (Again, based on the new lexical analyzer)
- It was asked for on the Haskell mailing list
- Useful when measuring code size

# Support for P logic

- Extension of Haskell 98
  - Predicate definitions
  - Assertions
- Parsing, pretty printing, type checking

# PFE - a front-end framework

- All the front-end functionality has been collected in an extensible framework
- Used mainly through a command line interface
  - Command line interface inspired by CVS
  - Built-in make(1)-like functionality
    - (Dependencies between modules are detected automatically)
- Extensible in many dimensions
  - Language extensions
  - New commands
  - Extended internal state

# PFE Haskell Browser

- A Haskell 98 browser based on the PFE framework
- Similar to the HTML translation of Haskell 98
  - Syntax highlighting
  - Navigation
- Can type check and display types
- Can be extended to a graphical user interface to the PFE frame-work
- In progress: support for certificates

# Publications

- "A Formal Specification of the Haskell 98 Module System"
  - Iavor S. Diatchki, Mark P. Jones, Thomas Hallgren
  - A paper submitted to the 2002 Haskell Workshop
- "A Lexer for Haskell in Haskell"
  - Thomas Hallgren
  - A talk presented at the Haskell Implementers Meeting, Portland, January 2002

# What's next

- Integrate support for certificates in the PFE framework
- More work on translation of Haskell and the P logic to theorem provers
- Polish off parts of the tools and release them to the Haskell community.
  - Tools often asked for (that we could implement with little effort):
    - Replace layout with explicit braces and semi-colons
    - Transform away the module system
      - (combining many modules into one)
    - Transform away overloading
    - Documentation tools

# The end

## Questions?