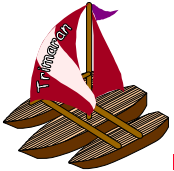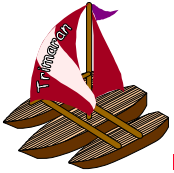# Customizing and Running the Trimaran System

The Trimaran GUI
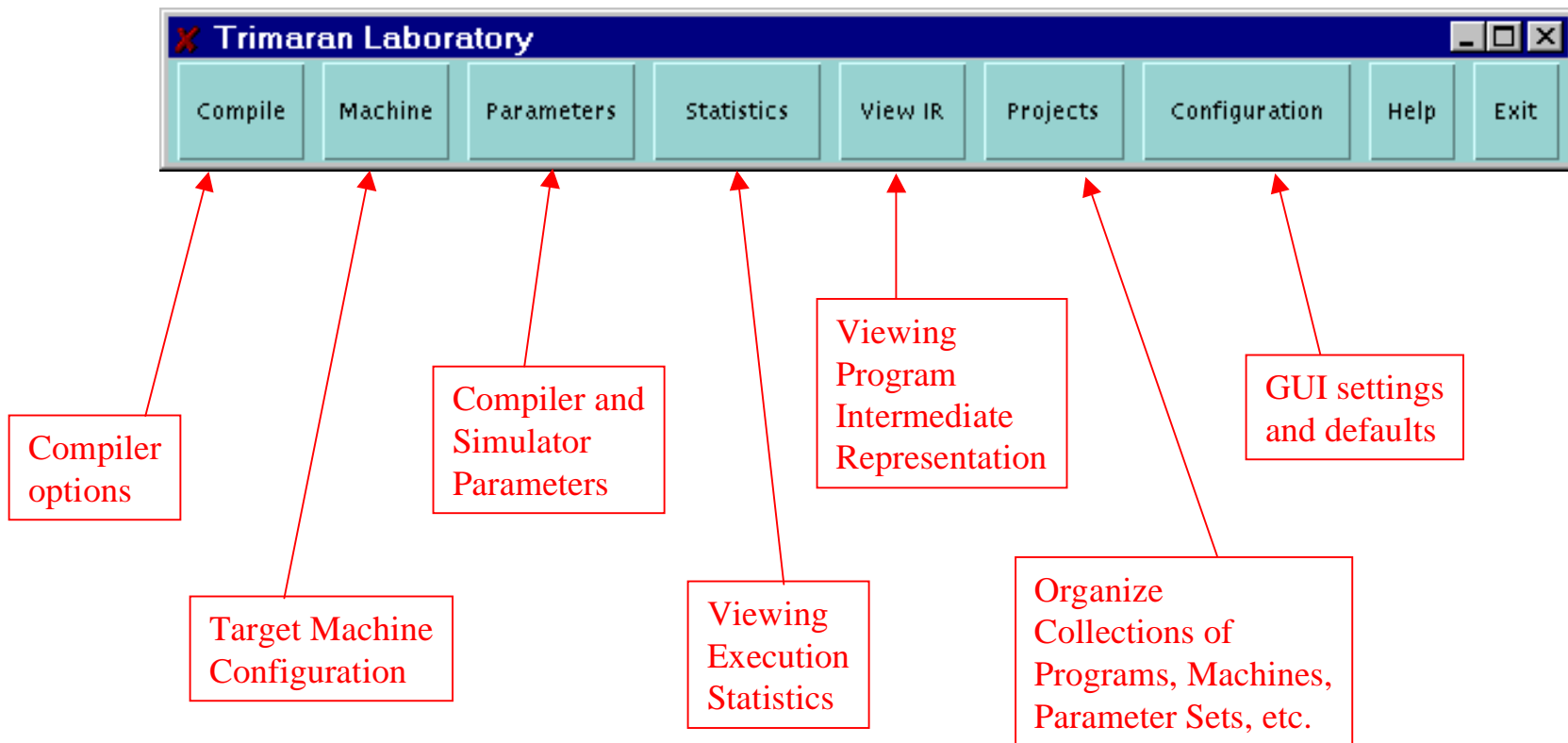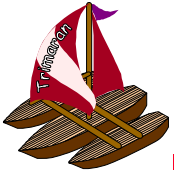
- The Trimaran system is configured and run via a Graphical User Interface
  - choose program to compile
  - configure target machine
  - configure compilation stages
  - view graphical program representations at various stages of compilation
  - view execution statistics (graphs, pie charts, etc.)
  - view extensive on-line help and documentation.

- If desired, the system can also be run from the command line and be invoked from shell scripts.

The control panel

- **The GUI is operated from this main control panel.**

| Compile | Machine | Parameters | Statistics | View IR | Projects | Configuration | Help | Exit |

Trimaran Laboratory

Compiler options

Target Machine Configuration

Compiler and Simulator Parameters

Viewing Execution Statistics

Viewing Program Intermediate Representation

Organize Collections of Programs, Machines, Parameter Sets, etc.

GUI settings and defaults

Trimaran Tutorial

The Compiler Panel

- **The compiler panel allows you to choose a:**
  - benchmark program to compile
    - you can add your own as well.
  - target machine configuration
  - parameter set (for the compiler and simulator)
  - project file

- **It also allows you to easily configure the stages of the compiler and start the compilation process.**
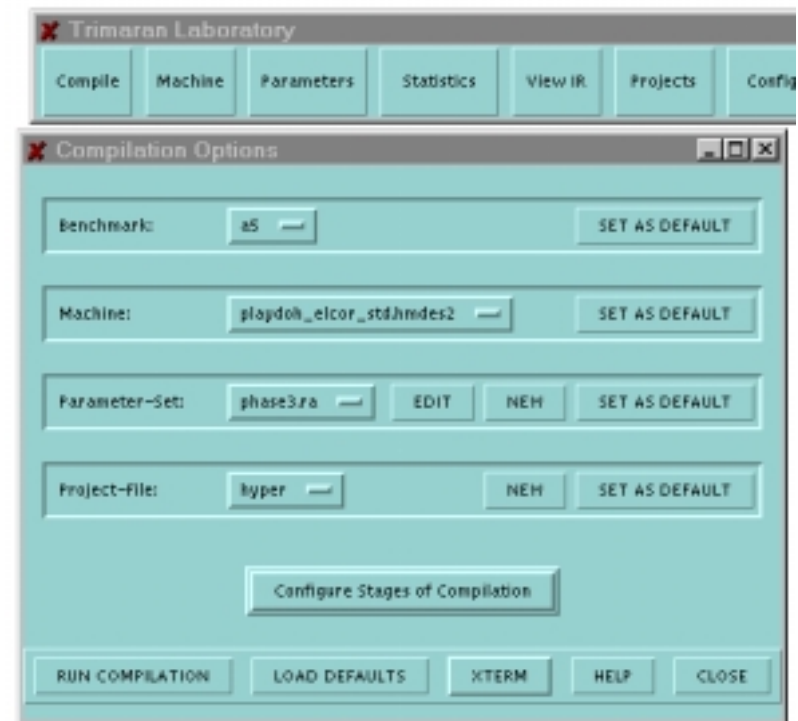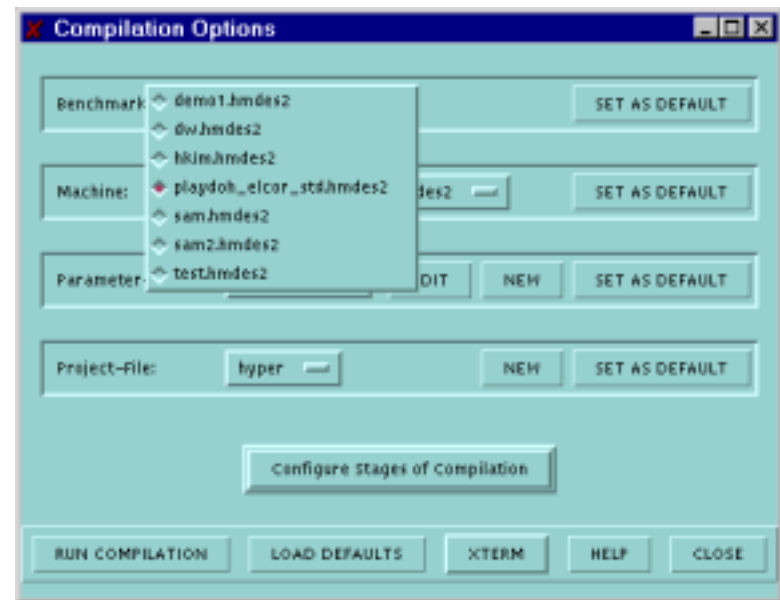
Choosing a benchmark and machine
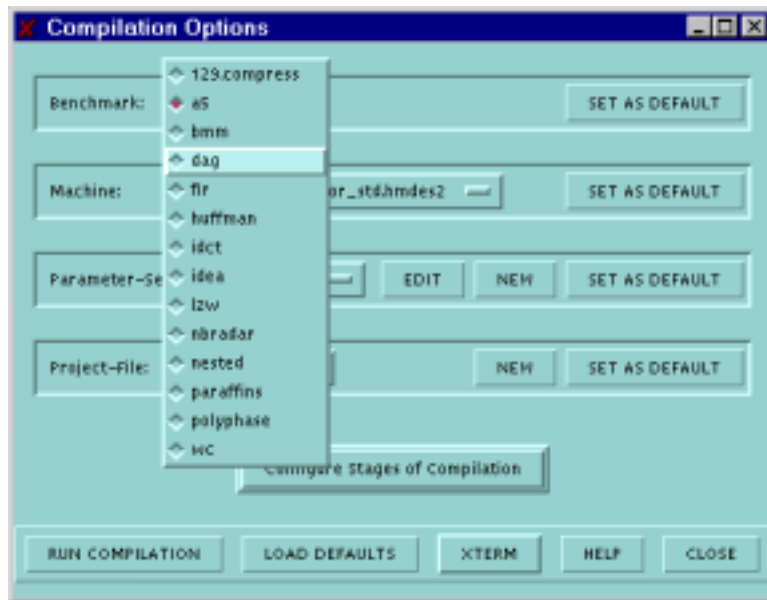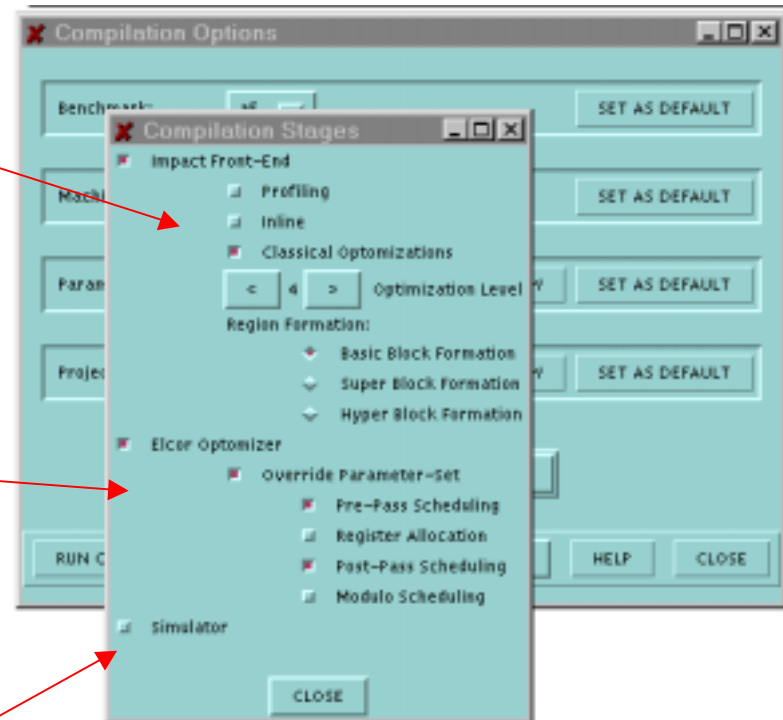

Choosing a benchmark

Choosing a machine

Configuring the compiler
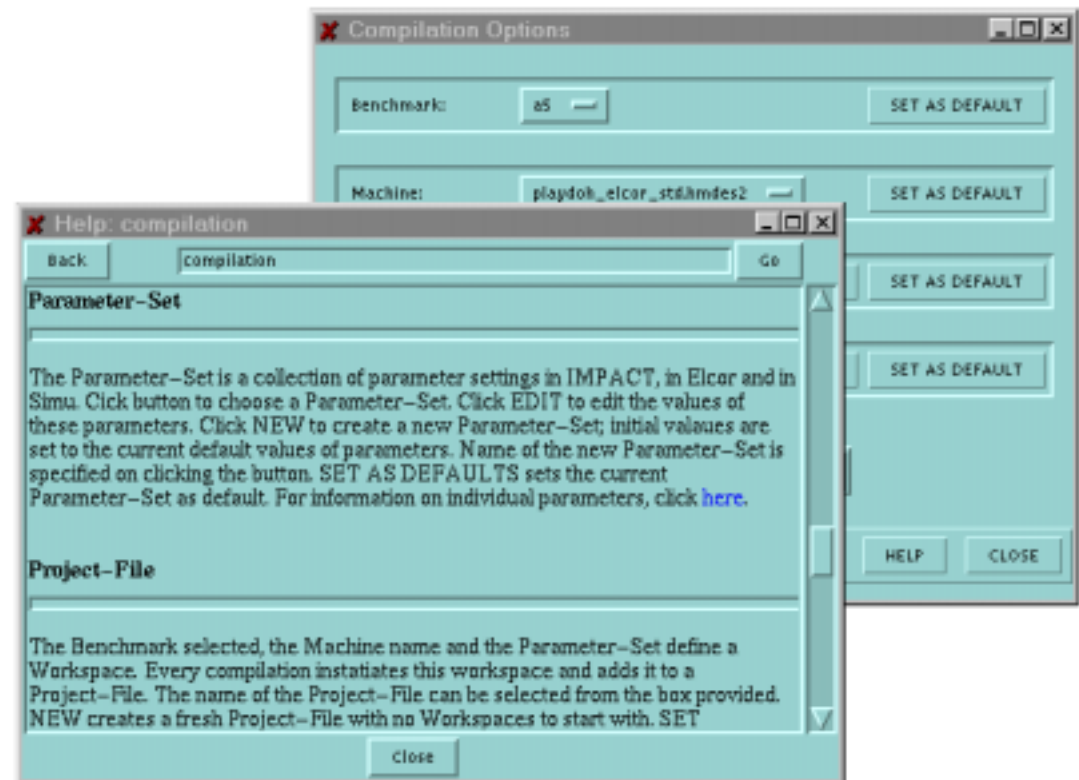

Front end features
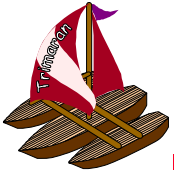
Back end features

Simulator on/off

On-line Documentation

- **On-line documentation is available for each component of Trimaran**
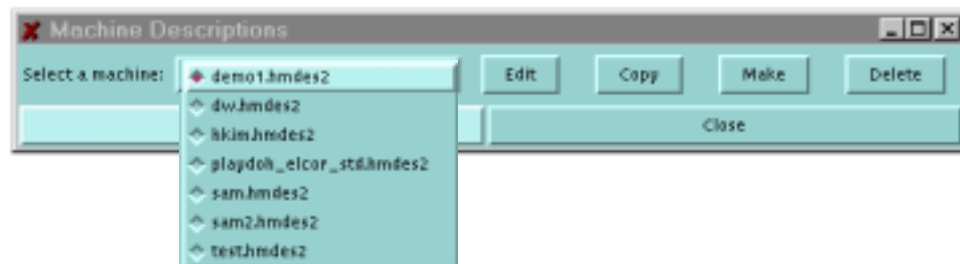 - this is the on-line help for the compiler panel.

The Machine Panel

- The machine panel is used create new target machines and modify existing ones.

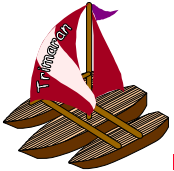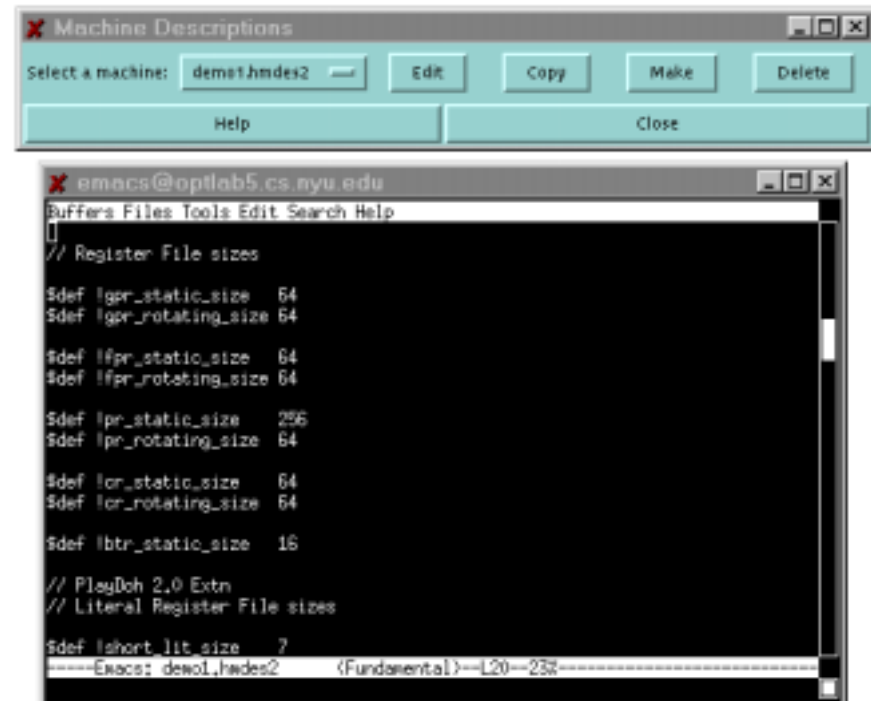- Here, one selects an existing machine to copy or modify.

Machine Descriptions

- To edit a machine description, the GUI opens an editor window.

- Trimaran includes a very powerful machine description facility.
  - It is the subject of an entire section of this tutorial.
 - The GUI interface simplifies the process of machine description.

The Parameters Panel

- **The parameters panel allows you to modify a large number of parameters used by the front end, the back end, and the simulator.**

  – Generally, the default settings will be used.

- **Once a new parameter set has been configured, the set can be named and saved for subsequent use.**

Trimaran Tutorial
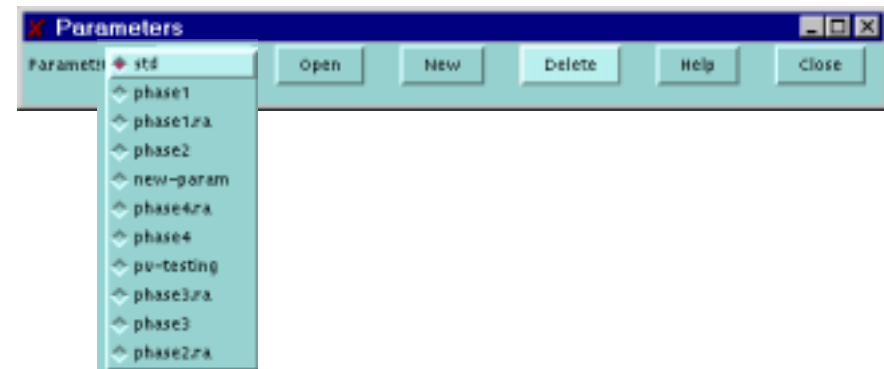
Modifying Parameters
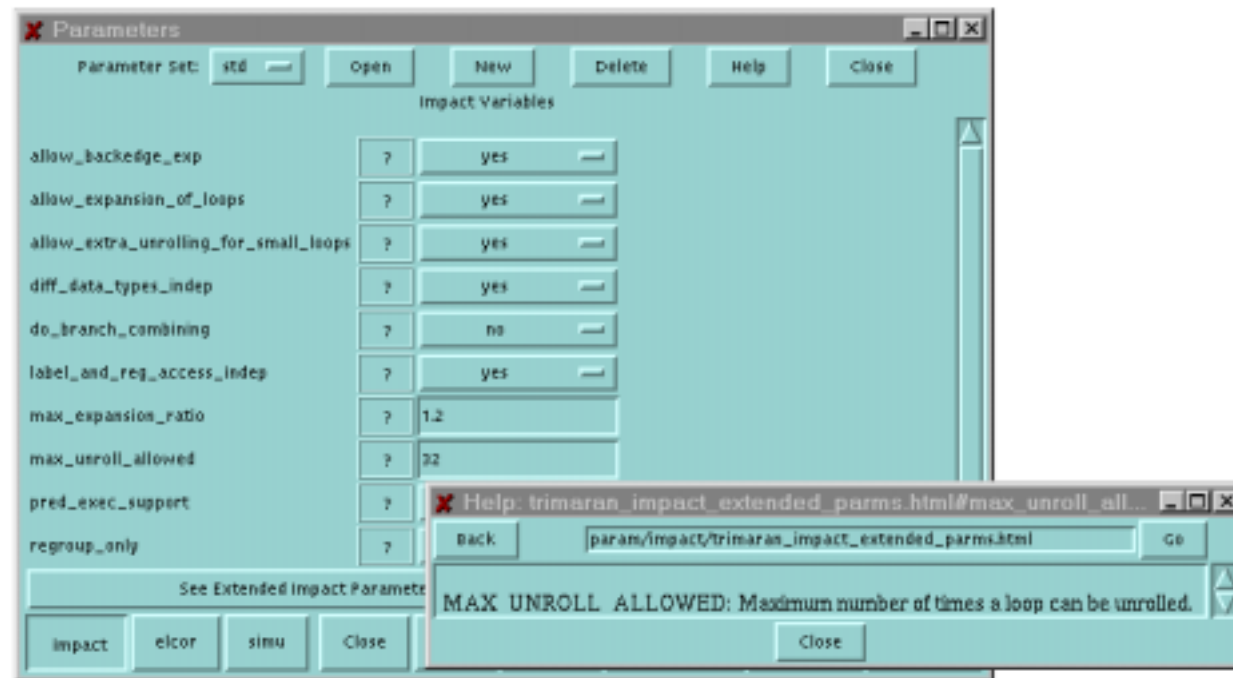
- Upon clicking 'open', the parameters are displayed.
  - Here, the compiler front end parameters are displayed, along with their current values.
  - Clicking a '?' button opens a help window for that parameter.
- Parameters can also be modified by editing text files, if desired.

Parameters for the Back End

- **The compiler back end has the largest number of parameters.**

- **The parameters are organized into groups according to their use.**
  - Analysis
  - Optimizations
  - Register Allocation
  - Etc.

Help window
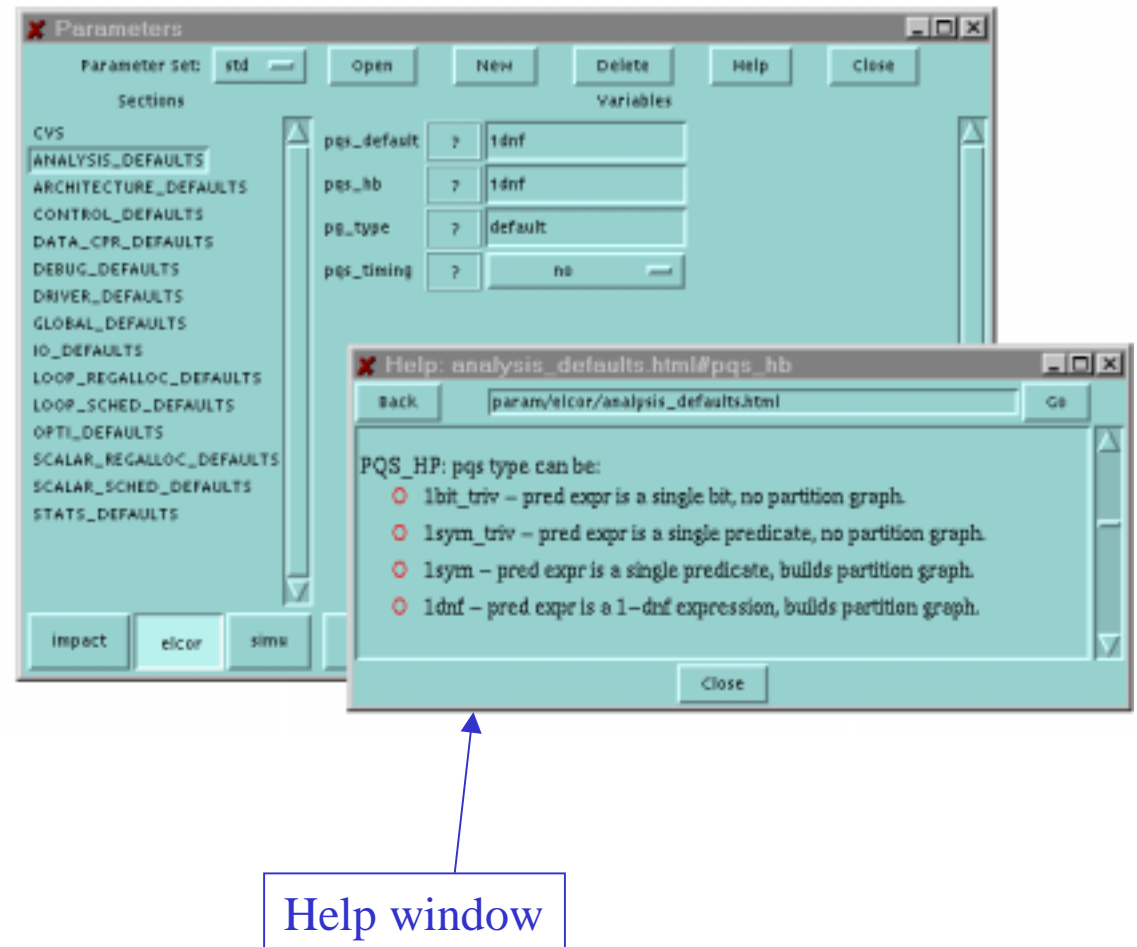
The Statistics Panel

- The statistics panel allows you to choose what statistics are displayed for the programs in one's project file.

  – Function level execution profile

  – Region level profile

  – Instruction usage

  – Etc.
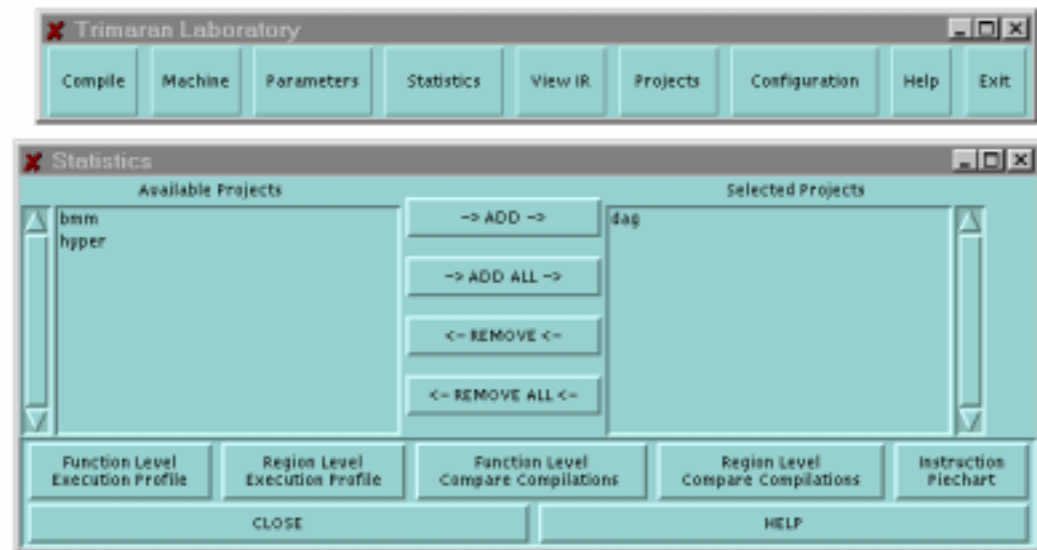
Viewing Statistics

- **For each program in your project file, a separate graph is displayed.**
  - Here, pie charts show the dynamic instruction distribution.
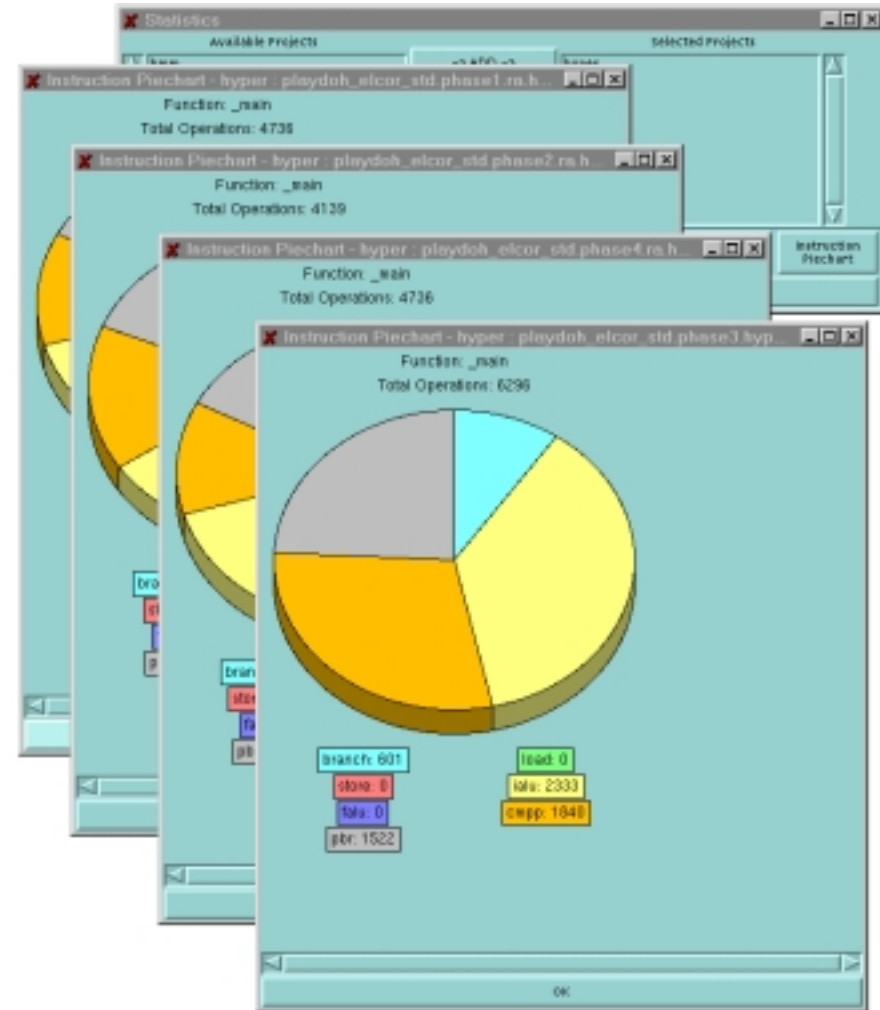
The View IR Panel

- The IR viewer provides five kinds of views of a program.
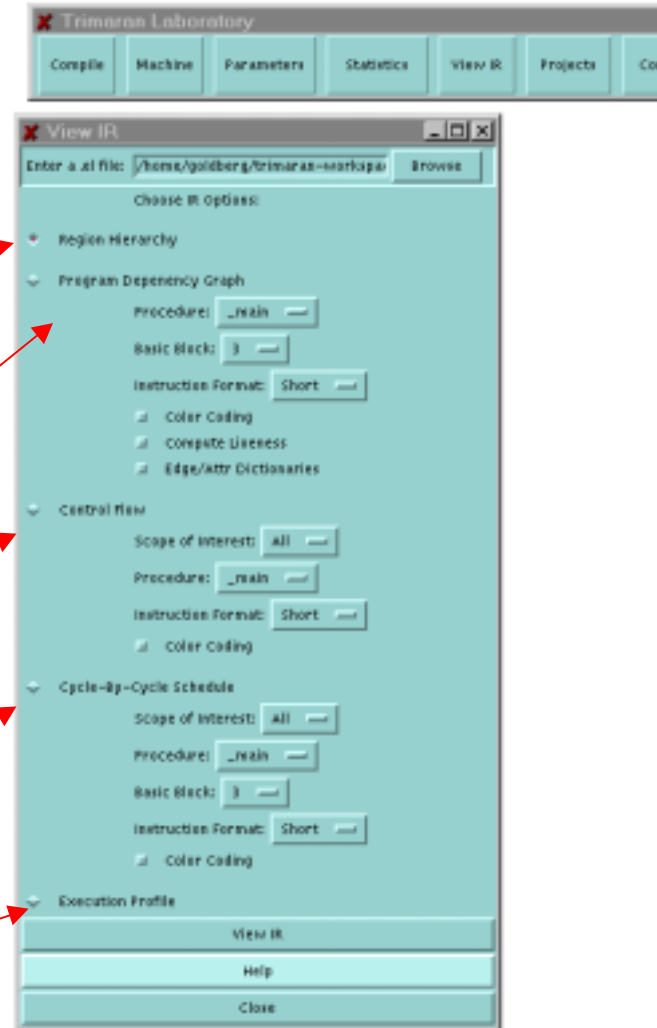
The program regions (hyperblocks, loops, etc.)

Dependence Graph

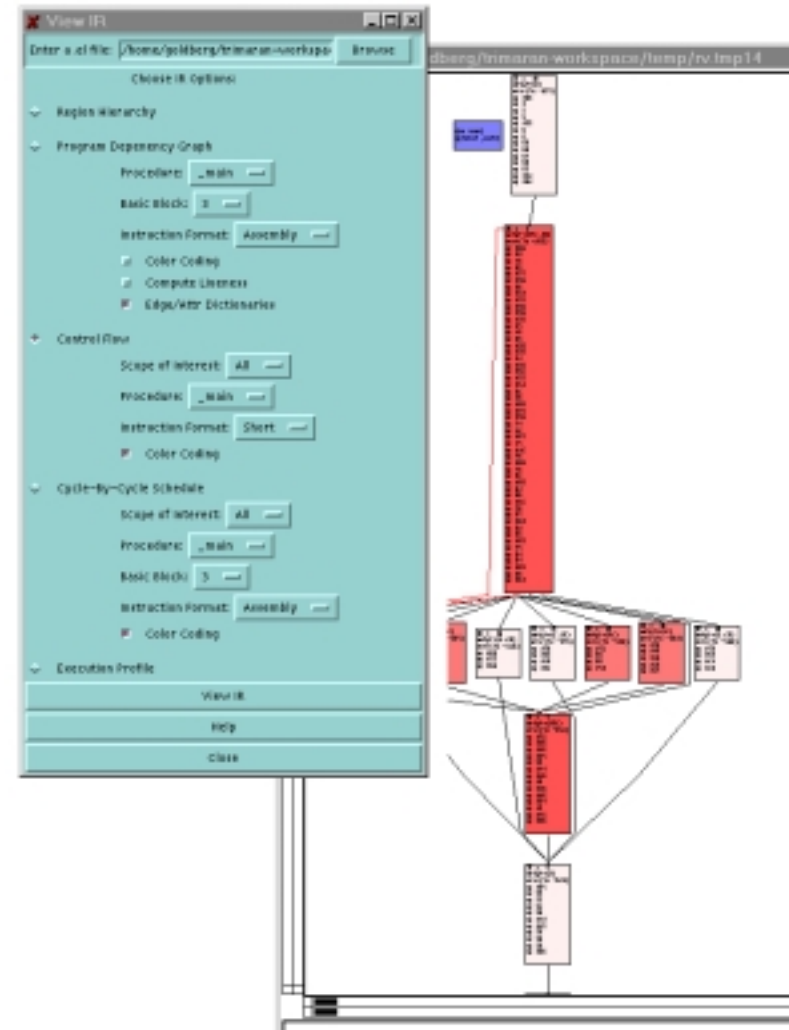Control Flow Graph (CFG)

ILP Instruction Schedule

Profile Information

Control Flow View

- Here is a portion of the control flow graph for a program.

- The user can specify a portion of the program to display.

- The viewer has zoom in, zoom out, scroll, etc.
  - other IR views are presented elsewhere in this tutorial.

Summary

- The Trimaran GUI provides a natural interface for configuring and running the Trimaran system.
  - Lowers barrier to entry for new user
    - no learning makefiles, searching parameter files, etc.
  - Provide interface to powerful visualization tools
    - IR viewer, execution statistics