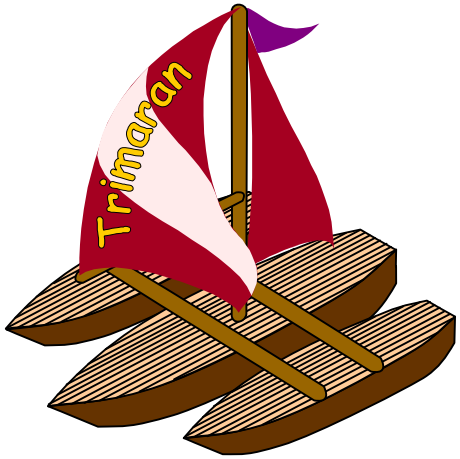

The Trimaran Compiler Research Infrastructure for Instruction Level Parallelism

The Trimaran Consortium

- Trimaran is a collaborative effort between the CAR group at Hewlett Packard Laboratories, the IMPACT project at the University of Illinois, and the ReaCT-ILP project at New York University.
- The Trimaran web page is

  www.trimaran.org

Compiler and Architecture Research (CAR) Group Hewlett-Packard Laboratories

- Mission
  - Earlier, this group was focused on developing the EPIC (Explicitly Parallel Instruction Computing) style of architecture as exemplified by the HPL-PD architecture. More recently, the emphasis of CAR has been on developing the compiler technology for EPIC processors and Elcor, CAR's compiler research infrastructure.
  - The current emphasis is on automatically architecting custom, application-specific processors for embedded applications
- Contributors to Trimaran
  - Vinod Kathail (Trimaran Lead), Santosh Abraham, Sadun Anik, Shail Aditya Gupta, Richard Johnson, Scott Mahlke, Bob Rau, Mike Schlansker, Greg Snider
  - 12+ research interns who have contributed to Elcor over the last 4 years

The ReaCT-ILP Project
New York University

- Mission
  - Our mission is the innovation of compiler-centric tools to enable rapid prototyping of embedded software. These innovations are based on challenging research in programming languages, compiler optimizations as well as in architectural support and novel adaptive hardware. Ensuring that specified timing constraints are met, while providing high performance execution of the application program is at the heart of much of our innovation.The anticipated orders of magnitude drop in software prototyping time, and hence, costs will lead to more rapid and pervasive growth of embedded systems.
- Contributors to Trimaran
  - Prof. Krishna Palem, Han-Soo Kim, Allen Leung, Igor Pechtchanski, Rodric Rabbah, Surendranath Talla, Xiao Li, Amitabh Nene, Sam Tregar, Regina Trosti, Prof. Robert Dewar, Prof. Benjamin Goldberg, Prof. Kanchi Gopinath (IISc, India)

The IMPACT Research Group
University of Illinois at Urbana-Champaign

- Mission
  - The objective of IMPACT (Illinois Microarchitecture Project utilizing Advanced Compiler Technology) is to provide critical research, architecture expertise, and compiler prototypes for the microprocessor industry
  - This objective is accomplished by analyzing and demonstrating the level of hardware and compiler support required by architectural enhancements in order to understand the cost and effectiveness of these enhancements
  - IMPACT's primary focus is on instruction-level parallelism (ILP)
  - The IMPACT web page: www.crhc.uiuc.edu/IMPACT
- Contributors to Trimaran
  - Most importantly, the 45+ IMPACT graduate students who have developed the IMPACT compiler framework over the last ten years.
  - Prof. Wen-mei Hwu (IMPACT research group lead)
  - Prof. John Gyllenhaal (Trimaran release effort lead)
  - Special thanks to: Brian Deitrich, Ben-Chung Cheng, David August, John Sias, Sabrina Hwu, Scott Mahlke, Rick Hank, Dan Connors, Patrick Eaton, and Dan Lavery