



Madagascar Software Project

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the joy of software development

Connections

Power



software: free or open-source?



software: free or open-source?

1. "Run a program as you wish, for any purpose you wish, not limited to any narrowly defined application."
2. "Help yourself by improving the program (which requires access to source code)."
3. "Help your neighbor by sharing a copy of the program with them."
4. "Help community by sharing the improved copy at large."

*"Unquestionably one of the great seminal figures of the hacker culture."
—Eric Raymond, open source evangelist and author of The Cathedral and the Bazaar*

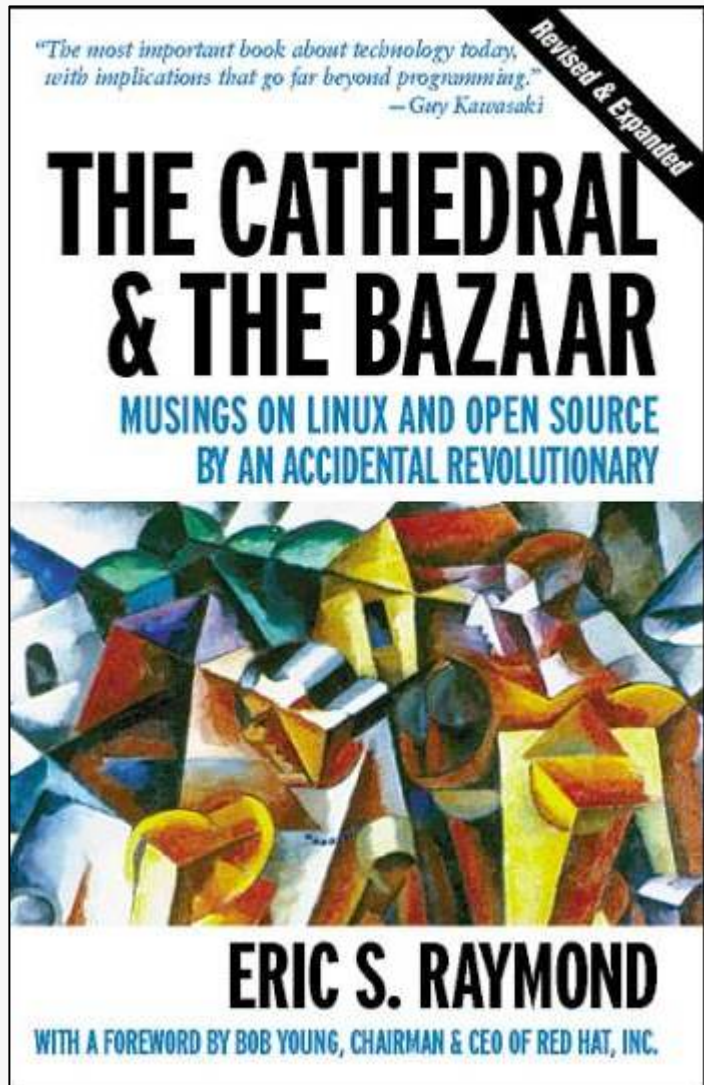
FREE AS IN FREEDOM

**RICHARD STALLMAN'S
CRUSADE FOR FREE SOFTWARE**



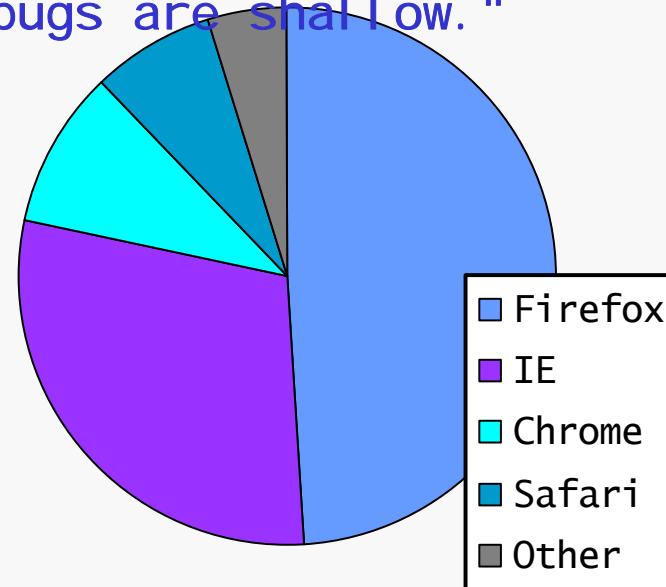
SAM WILLIAMS

Software: from power to connections

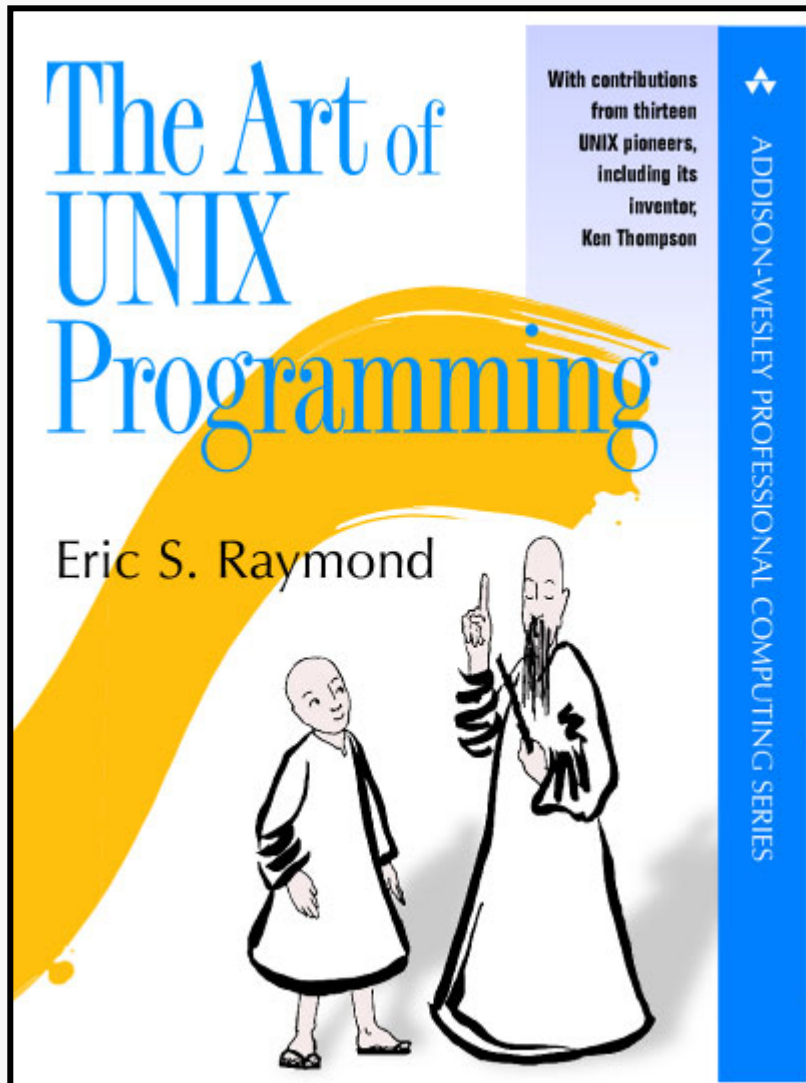


"Given a large enough beta-tester and co-developer base, almost every problem will be characterized quickly and the fix obvious to someone."

"Given enough eyeballs, all bugs are shallow."



open-source software and science



“Abandoning the habit of secrecy in favor of process transparency and peer review was the crucial step by which alchemy became chemistry.

In the same way, it is beginning to appear that open-source development may signal the long-awaited maturation of software development as a discipline.”

free/open-source software examples

- Linux kernel

- GPL, 1991, Unix



- GIMP

- GPL, 1996, Photoshop



- R project

- GPL, 1993, S



- Sage

- GPL, 2005, MATLAB/Mathematica

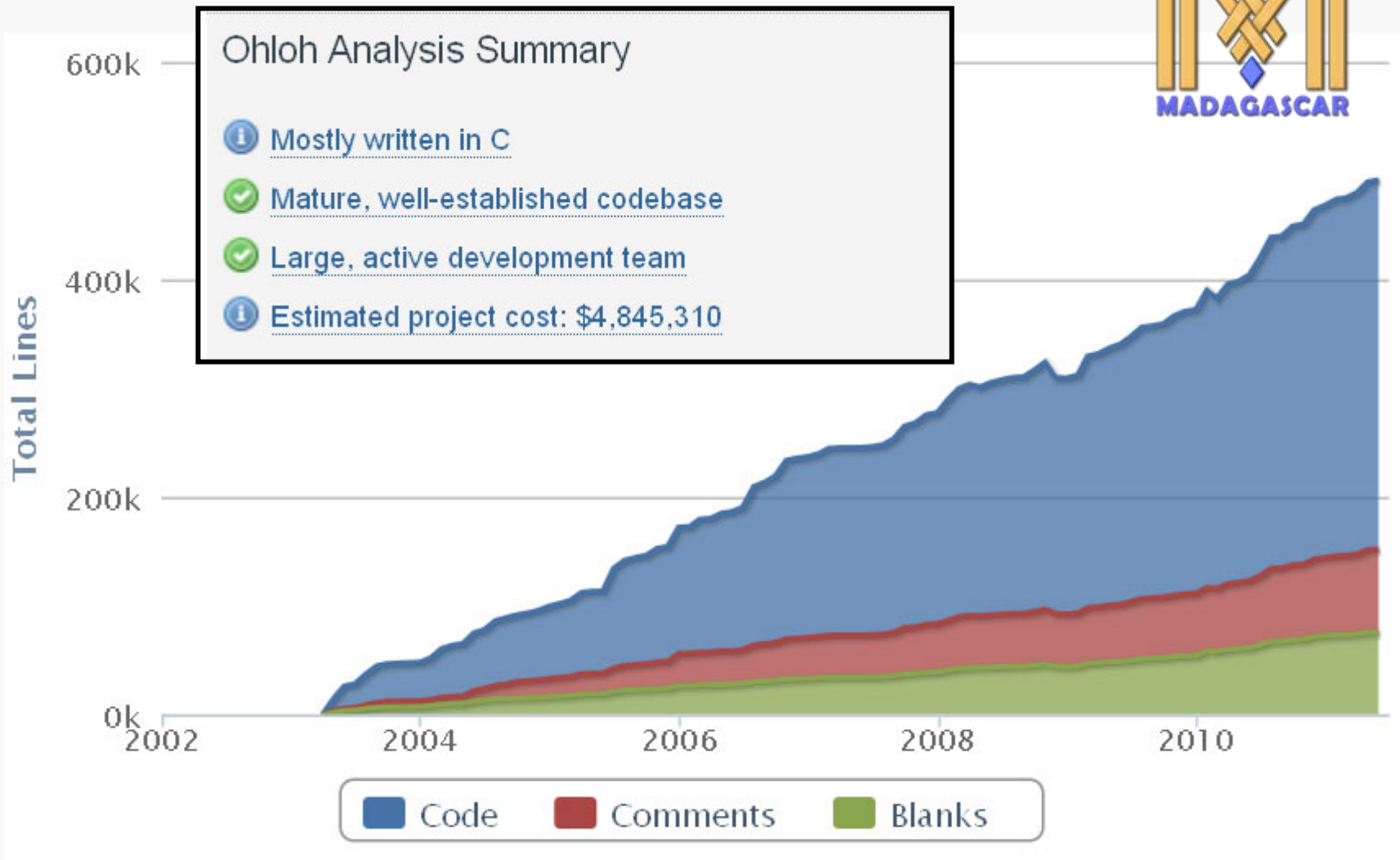


- Madagascar

- GPL, 2006, SEPI i b



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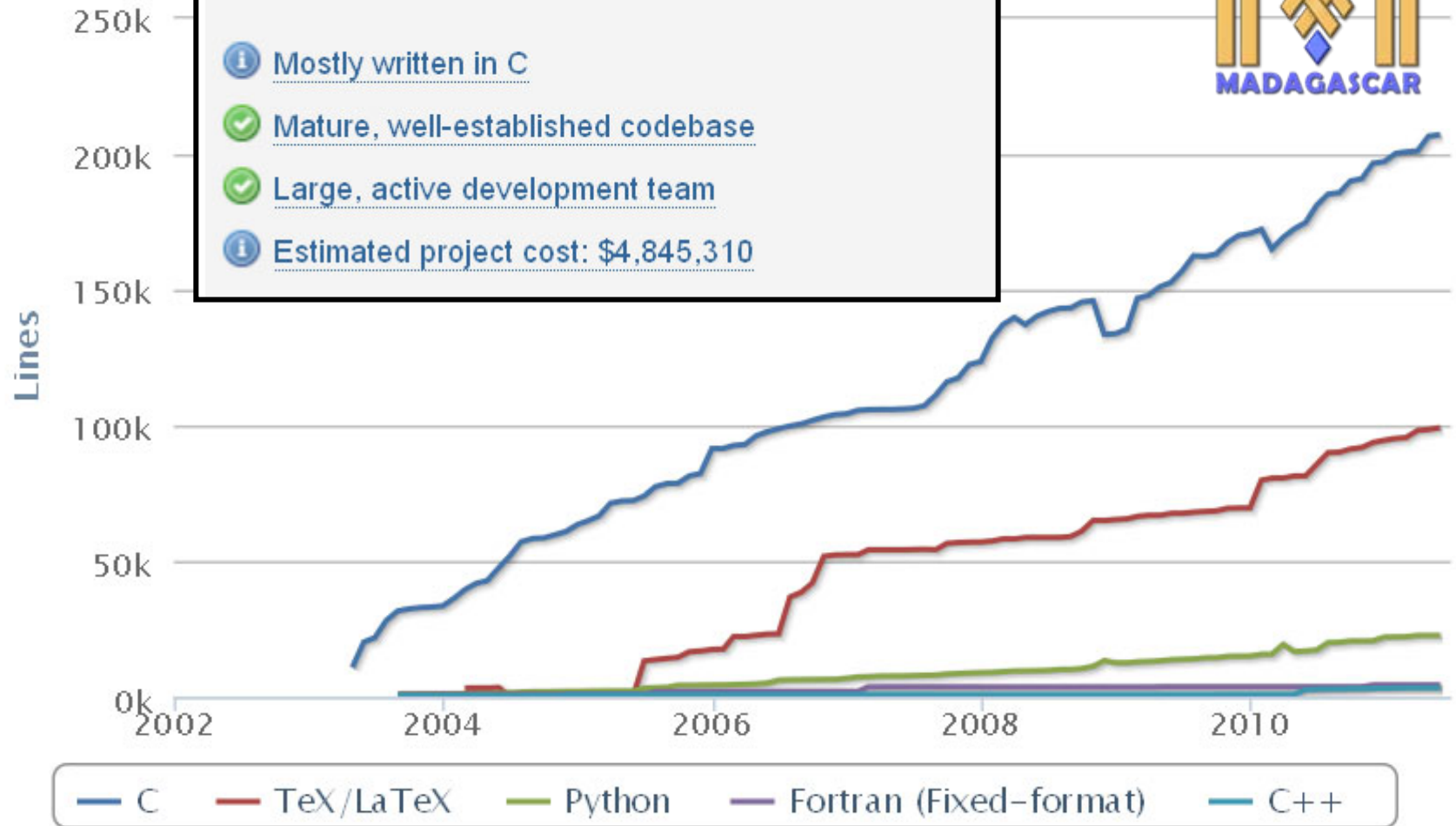


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Ohloh Analysis Summary

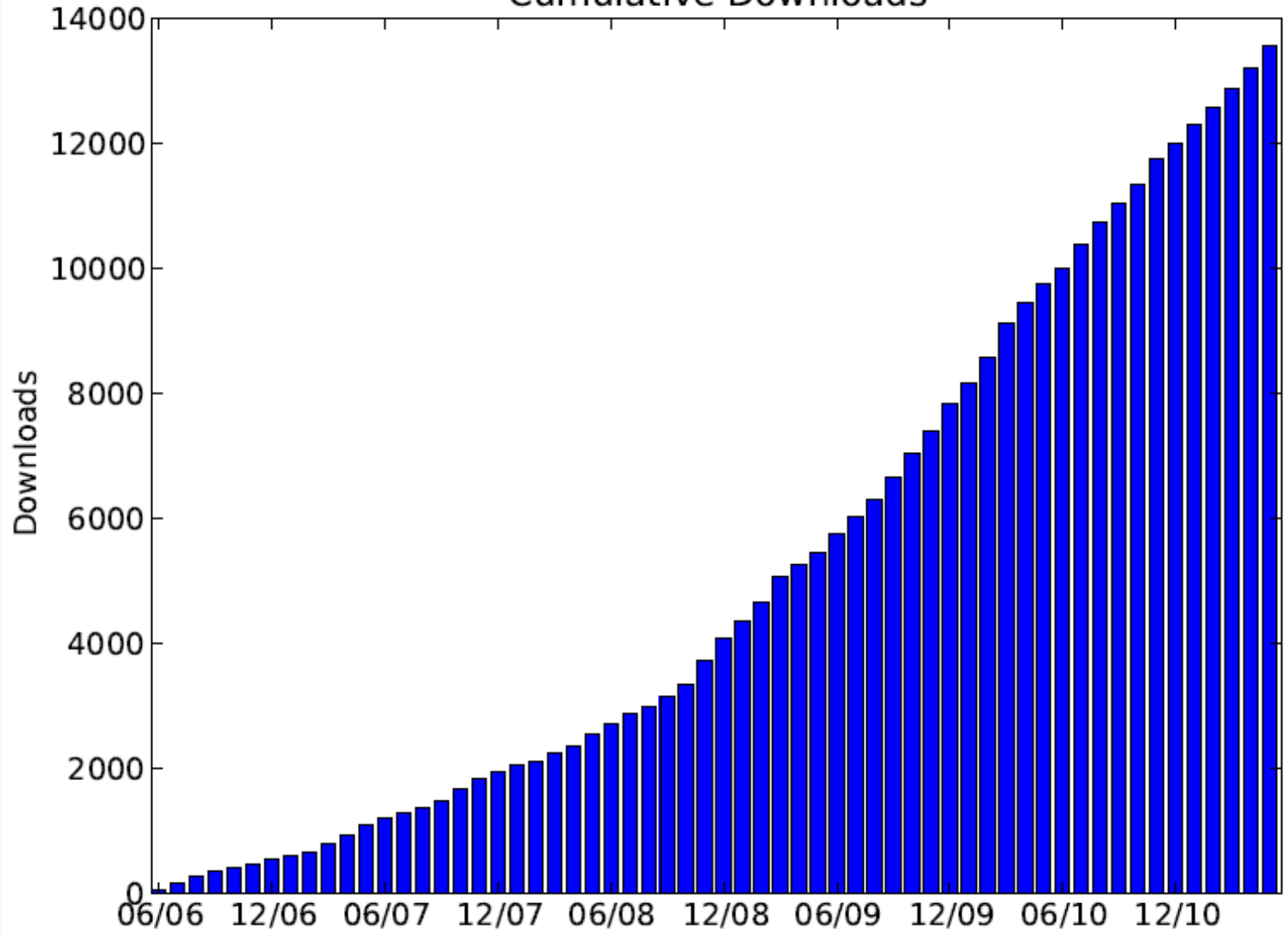
-  [Mostly written in C](#)
-  [Mature, well-established codebase](#)
-  [Large, active development team](#)
-  [Estimated project cost: \\$4,845,310](#)



contributors to madagascar code

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Paul Sava, Jeffrey Shragge, Xiaolei Song,
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Jia Yan, Lexing Ying

Cumulative Downloads



Vancouver - 2006



photo by Joe Dellinger

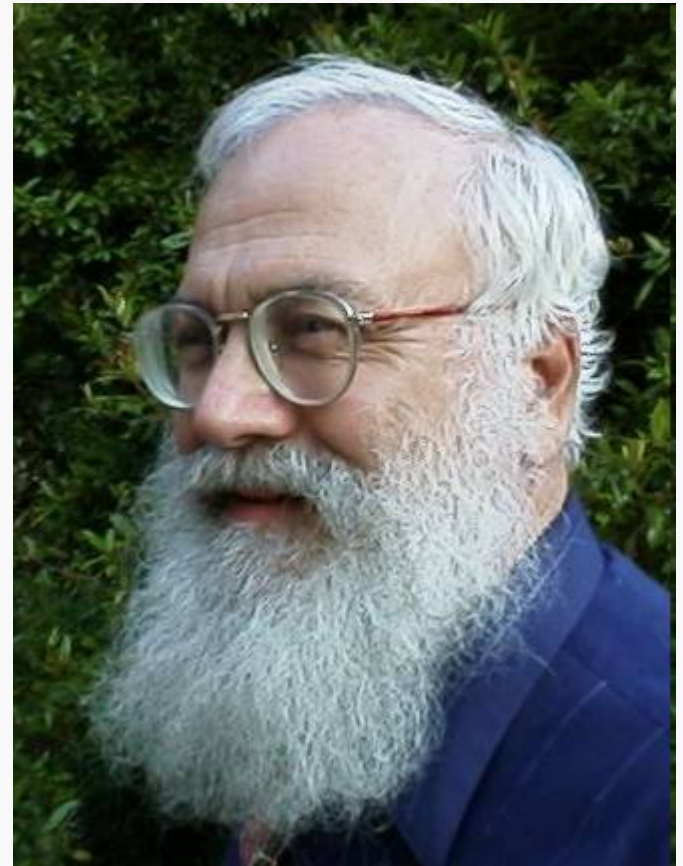
Houston-2010



photo by Joe Dellinger

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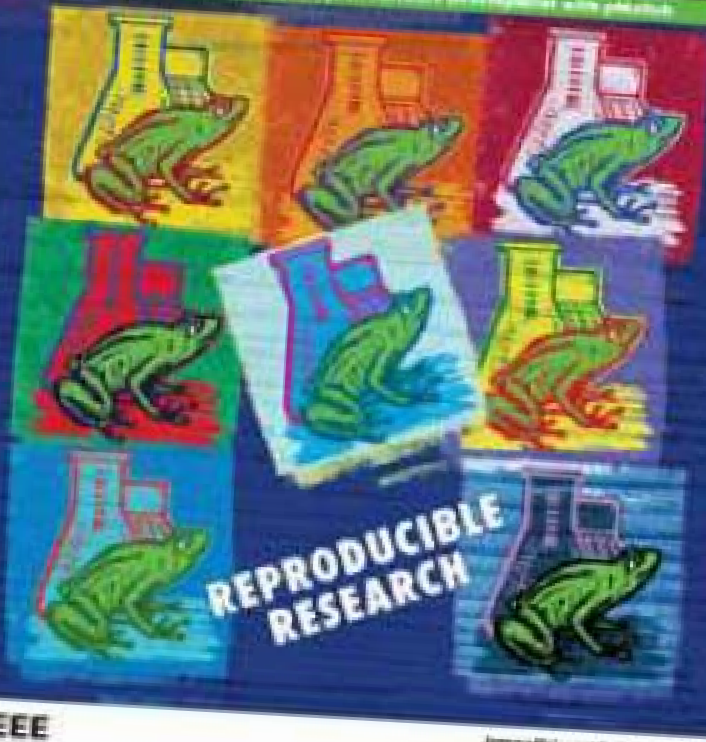
"An article about computational science in a scientific publication is not the scholarship itself, it is merely advertising of the scholarship. The actual scholarship is the complete software development environment and the complete set of instructions which generated the figures."
(Buckheit & Donoho, 1995)



Computing

IN SCIENCE & ENGINEERING

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REPRODUCIBLE
RESEARCH

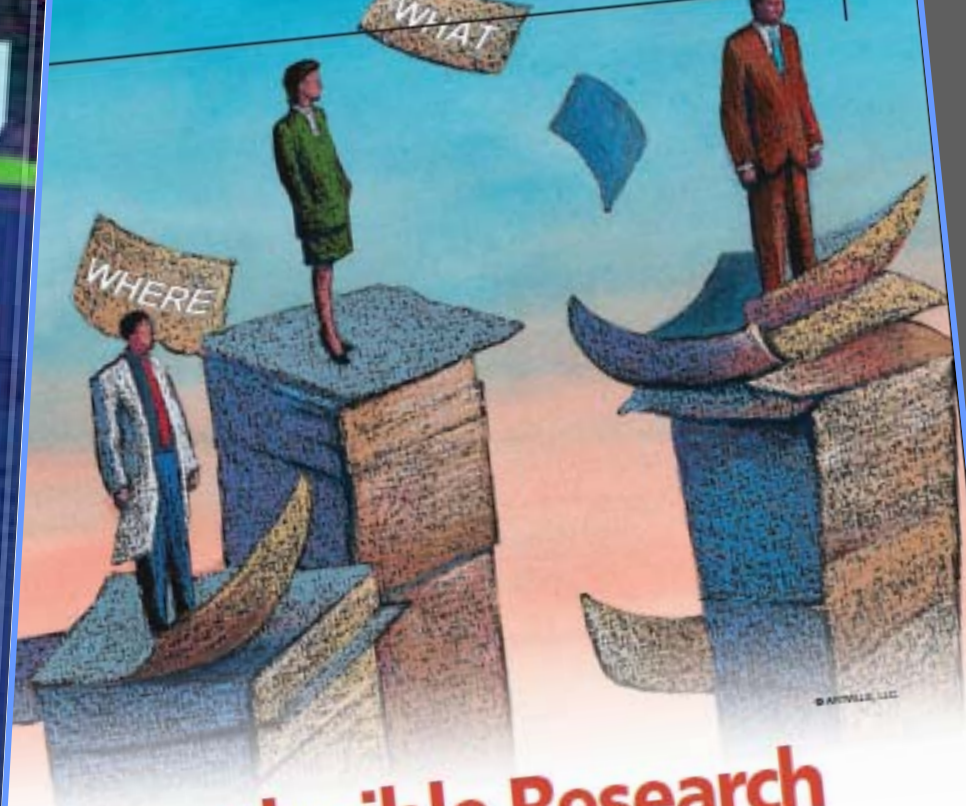


Computing in Science & Engineering



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Reproducible Research in Signal Processing

NEWS



REPRODUCIBLE RESEARCH

ADDRESSING THE NEED FOR DATA AND CODE SHARING IN COMPUTATIONAL SCIENCE

By the Yale Law School Roundtable on Data and Code Sharing

reproducible research in 2011

- The Digitalization of Science: **Reproducibility** and Interdisciplinary Knowledge Transfer at **AAAS**
- Verifiable, **Reproducible Research** and Computational Science at **SIAM CS&E**
- **Reproducible Science** and Open-Source Software in the Geosciences at **SIAM Geosciences**
- **Reproducible Research** at **Interface**
- **Reproducible Research**: Tools and Strategies for Scientific Computing at **AMP**
- **Reproducible Research** in Computational Science: What, Why, and How at **ICIAM**

Madagascar open-source project

- provides
 - collection of books and papers
 - with reproducible examples
 - framework for computational experiments
 - SCons
 - collection of filter programs
 - any language
- goal for version 1.0
 - automatic testing
 - reached in 2010
- goals for version 2.0
 - high-performance computing
 - seismic field data processing examples
 - applications beyond seismic
- help is needed

