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John Keller
Edward A. Lee
Jitendra Malik

EECS Faculty Lunch
November 7, 2005

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- Precise dating of ideas and results
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- Permanence
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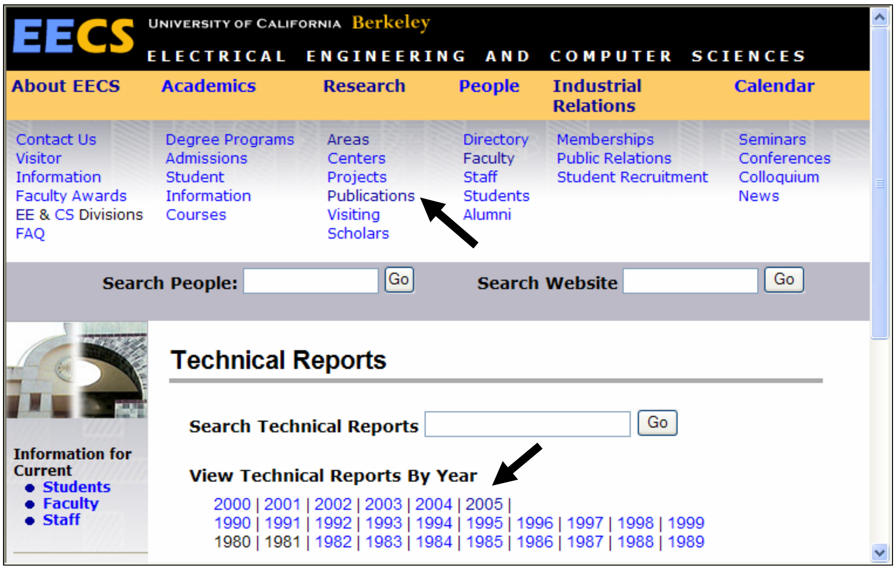
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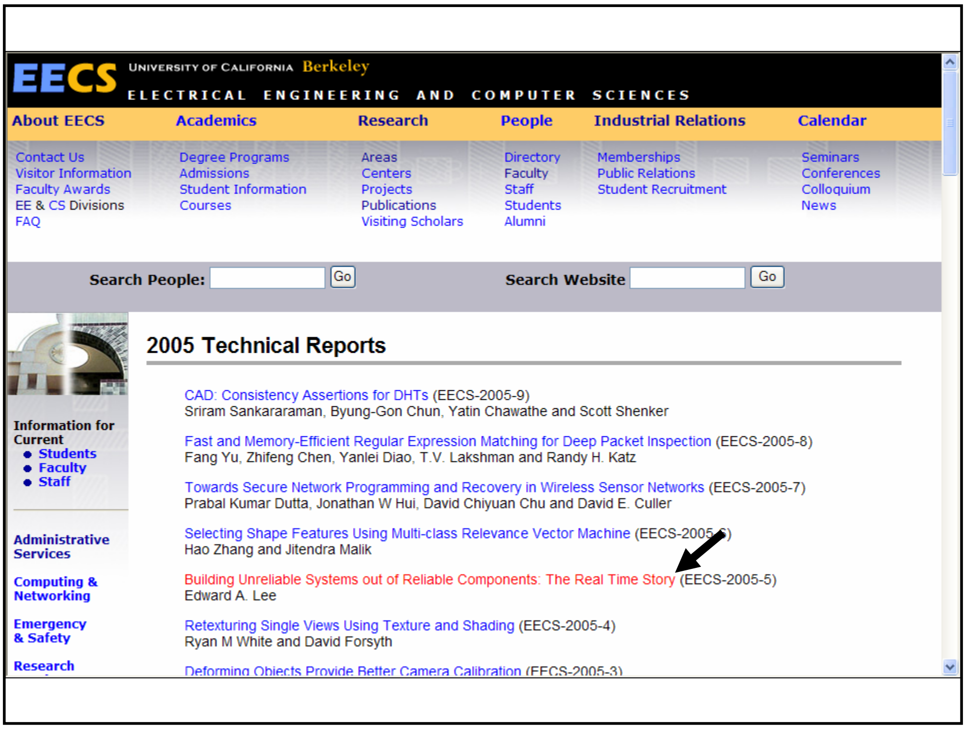
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Building Unreliable Systems out of Reliable Components: The Real Time Story (EECS-2005-5)
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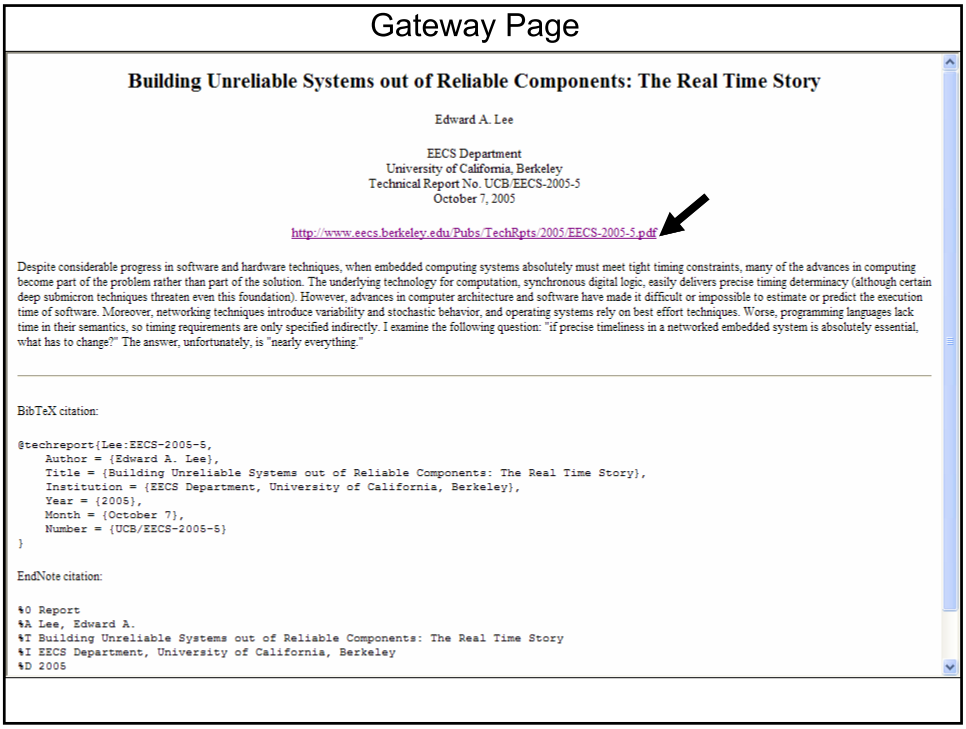

Building Unreliable Systems out of Reliable Components: The Real Time Story

Edward A. Lee

EECS Department
University of California, Berkeley
Technical Report No. UCB/EECS-2005-5
October 7, 2005

http://www.eecs.berkeley.edu/Pubs/TechRpts/2005/EECS-2005-5.pdf

Despite considerable progress in software and hardware techniques, when embedded computing systems absolutely must meet tight timing constraints, many of the advances in computing become part of the problem rather than part of the solution. The underlying technology for computation, synchronous digital logic, easily delivers precise timing determinacy (although certain deep submicron techniques threaten even this foundation). However, advances in computer architecture and software have made it difficult or impossible to estimate or predict the execution time of software. Moreover, networking techniques introduce variability and stochastic behavior, and operating systems rely on best effort techniques. Worse, programming languages lack time in their semantics, so timing requirements are only specified indirectly. I examine the following question: "if precise timeliness in a networked embedded system is absolutely essential, what has to change?" The answer, unfortunately, is "nearly everything."

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```
@techreport{Lee:EECS-2005-5,
    Author = {Edward A. Lee},
    Title = {Building Unreliable Systems out of Reliable Components: The Real Time Story},
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%T Building Unreliable Systems out of Reliable Components: The Real Time Story
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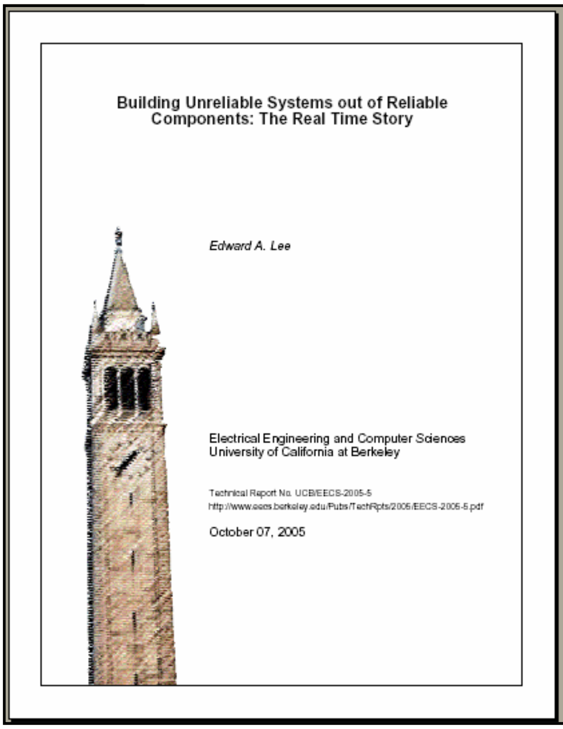

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Edward A. Lee

Electrical Engineering and Computer Sciences
University of California at Berkeley

Technical Report No. UCB/EECS-2005-5
http://www.eecs.berkeley.edu/Pubs/TechRpts/2005/EECS-2005-5.pdf

October 07, 2005

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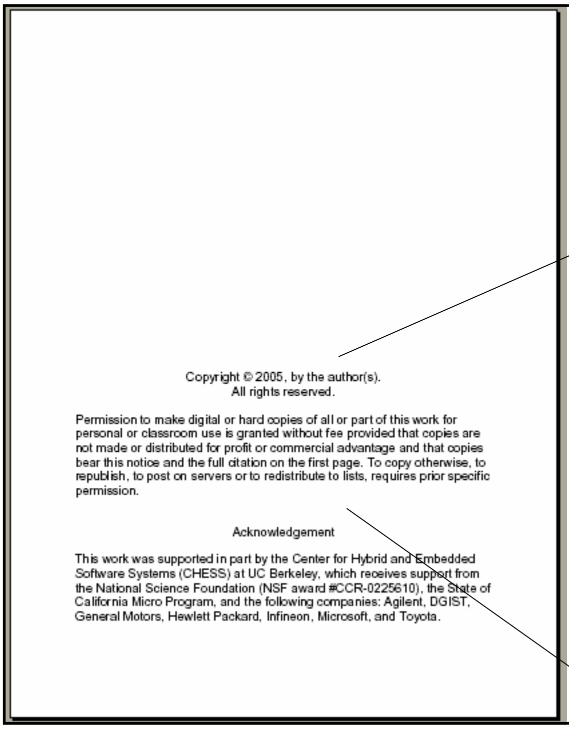

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Acknowledgement

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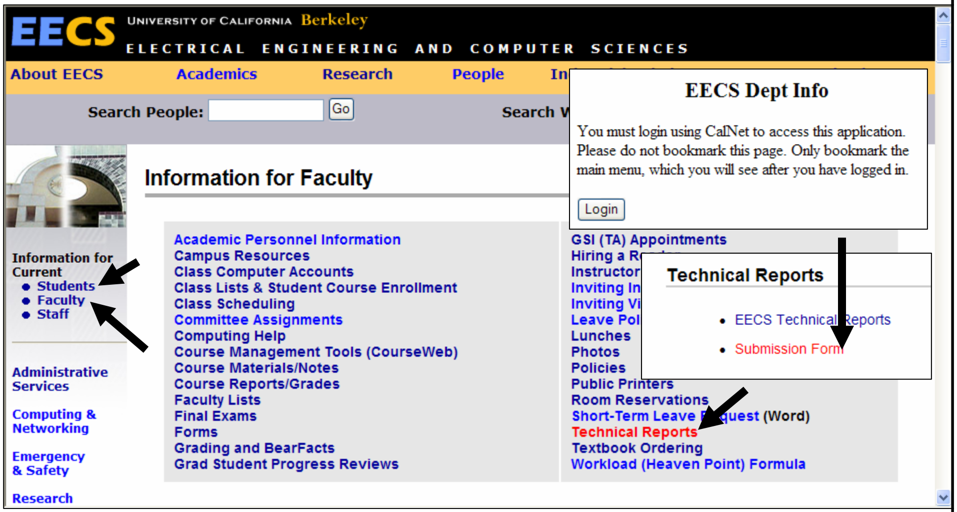

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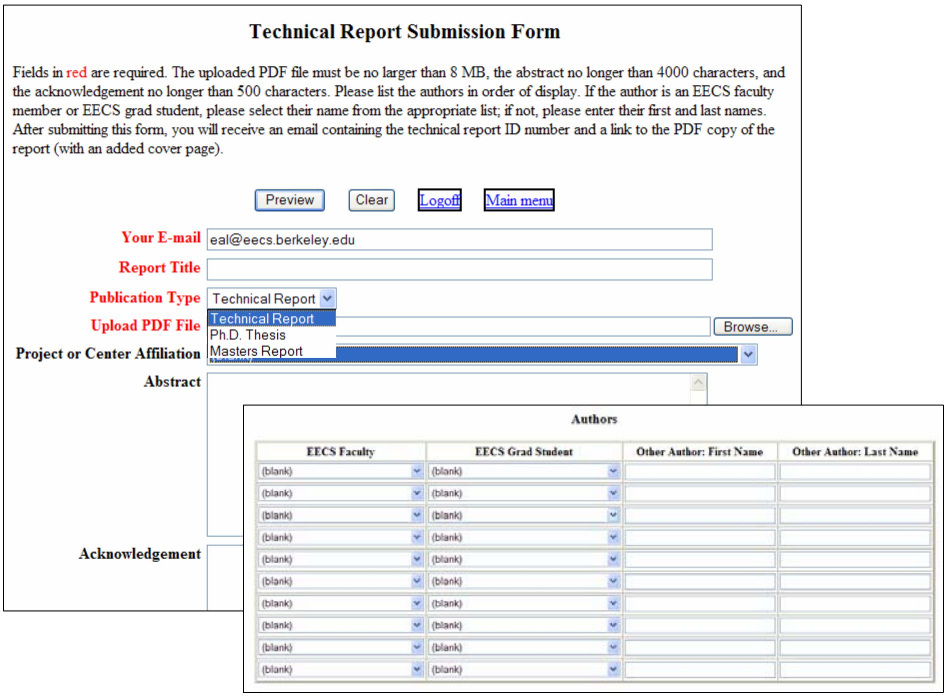

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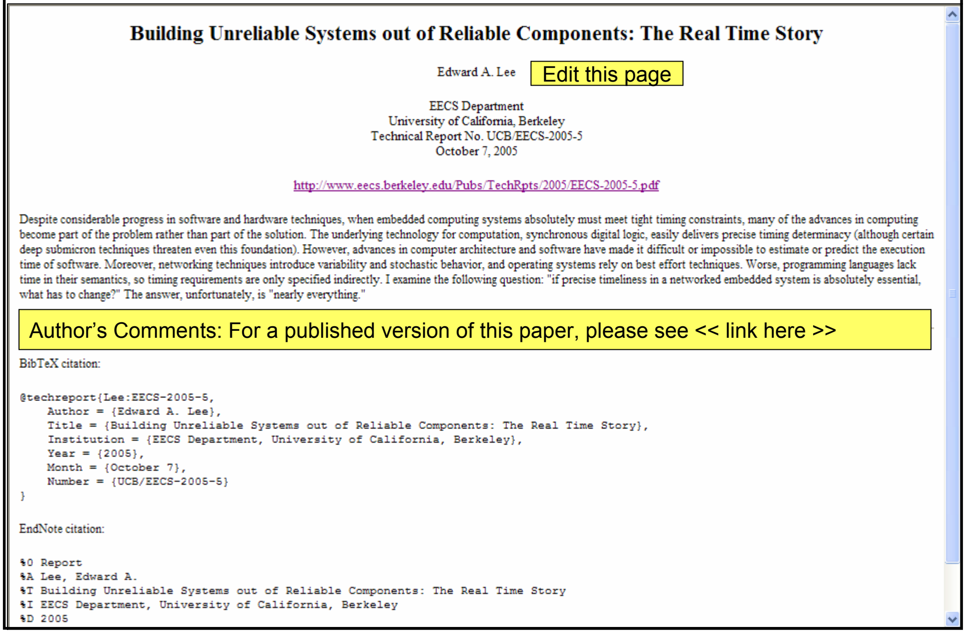

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Edward A. Lee **Edit this page**

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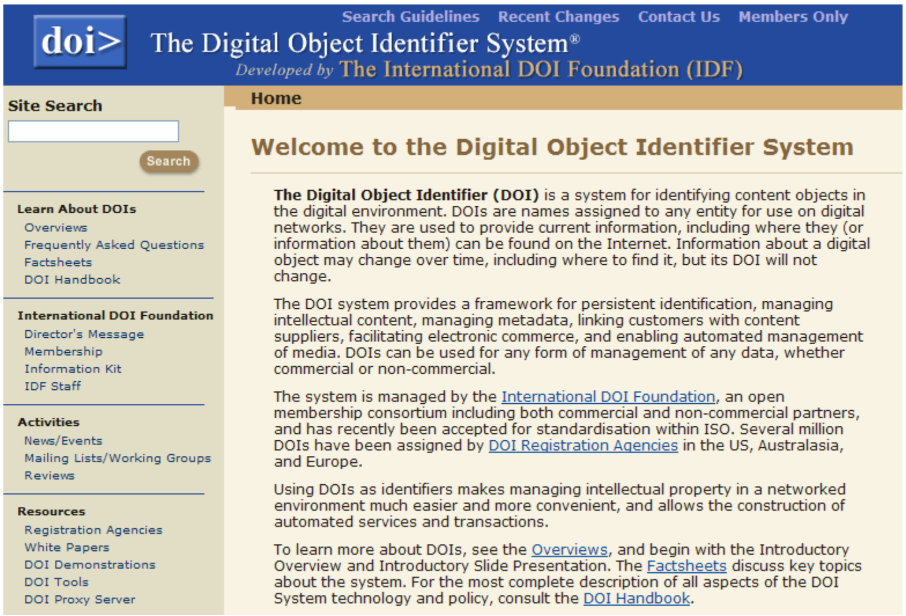

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- ERL memo series
  - shut down.
- CS memo series
  - shut down 10/31/05.
- CDL eScholarship repository
  - a viable, functioning alternative, but…
  - not integrated with identity management
  - does not promote EECS brand
  - does not lead to publications database

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