



Reproducibility in visualization: Do we want a ‘Badge of Honor’?

Britta Weber

Zuse Institute Berlin

Ensuring Verification, Validation and Reproducibility

Verification – "Are you building it right?" *

→ Very hard, see for example:

- *Verifiable Visualization for Isosurface Extraction*, T. Etienne et al., Vis 2009
- *Topology Verification for Isosurface Extraction*, T. Etienne et al., Vis 2010

Validation – "Are you building the right thing?" *

→ Even harder! See previous talks.

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What about the most basic standard:

Reproducibility –

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What about the most basic standard:

Reproducibility – Is code/binaries and data available?

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Reproducibility in CS

Victoria Stodden, 2010

“The Scientific Method in Practice: Reproducibility in the Computational Sciences”

Empirical Study of Sharing Behavior at NIPS (ML Conference)

1,758 participants, 134 took part in survey

- Why do people share code and data?
- Why not?

Rate factors from “Strong influence to share” to “Strong influence not to share” of 7 levels.

Top 10 reasons why researchers share their code


- | | |
|--|---------------|
| 1. Encouraging scientific advancement | 91.11% |
| 2. Encouraging sharing and having others share with you | 89.63% |
| 3. <i>Being a good community member</i> | 86.67% |
| 4. <i>Increase in publicity</i> | 85.19% |
| 5. <i>Improvement in the caliber of research</i> | 84.44% |
| 6. <i>The potential to set a standard for the field</i> | 82.22% |
| 7. <i>Potential to encourage others to work on the problem</i> | 81.48% |
| 8. <i>Opportunity to get feedback on your work</i> | 77.78% |
| 9. <i>Potential for finding collaborators</i> | 71.85% |
| 10. <i>The topic is receiving a lot of attention</i> | 71.11% |

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Top 10 reasons not to share Code

1. The time it takes to clean up and document for release	77.78%
2. Dealing with questions from users about the code	51.85%
3. <i>The possibility that your code may be used without citation</i>	44.78%
4. <i>The possibility of patents or other IP constraints</i>	40.00%
5. <i>Legal barriers, such as copyright</i>	33.72%
6. <i>Competitors may get an advantage</i>	31.85%
7. <i>The potential loss of future publications using this code</i>	31.11%
8. <i>The code might be used in commercial applications</i>	28.15%
9. <i>Availability of other code that might substitute for your own</i>	21.64%
10. <i>Whether you put in a large amount of work building the code</i>	20.00%
11. <i>Technical limitations, ie. webspace platform space constraints</i>	20.00%

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Reasons for not publishing data pretty much the same.

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So what? Be a good scientist! Just work harder!

The dilemma

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The prime directive in science:

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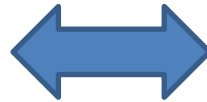
Publish or Perish!

The dilemma

The prime directive in science:

Publish or Parish!

Open code/binaries and
data



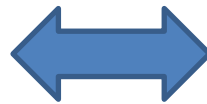
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Don't open code/binaries and data

- *Cleanup code*
- *Write documentation*
- *Create webpage*
- *Answer user questions*

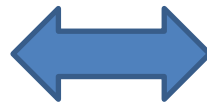
Benefits lie in the (far) future!

The dilemma

The prime directive in science:

Publish or Parish!

Open code/binaries and data



Don't open code/binaries and data

- *Cleanup code*
- *Write documentation*
- *Create webpage*
- *Answer user questions*

- *Start working on your next paper immediately*

Benefits lie in the (far) future!

Encouraging reproducible research in CS – The SIGMOD *'Badge of Honor'*

Don't punish – reward!

<http://www.sigmod.org/2012-staging/reproducibility.shtml>

Encouraging reproducible research in CS – The SIGMOD *‘Badge of Honor’*

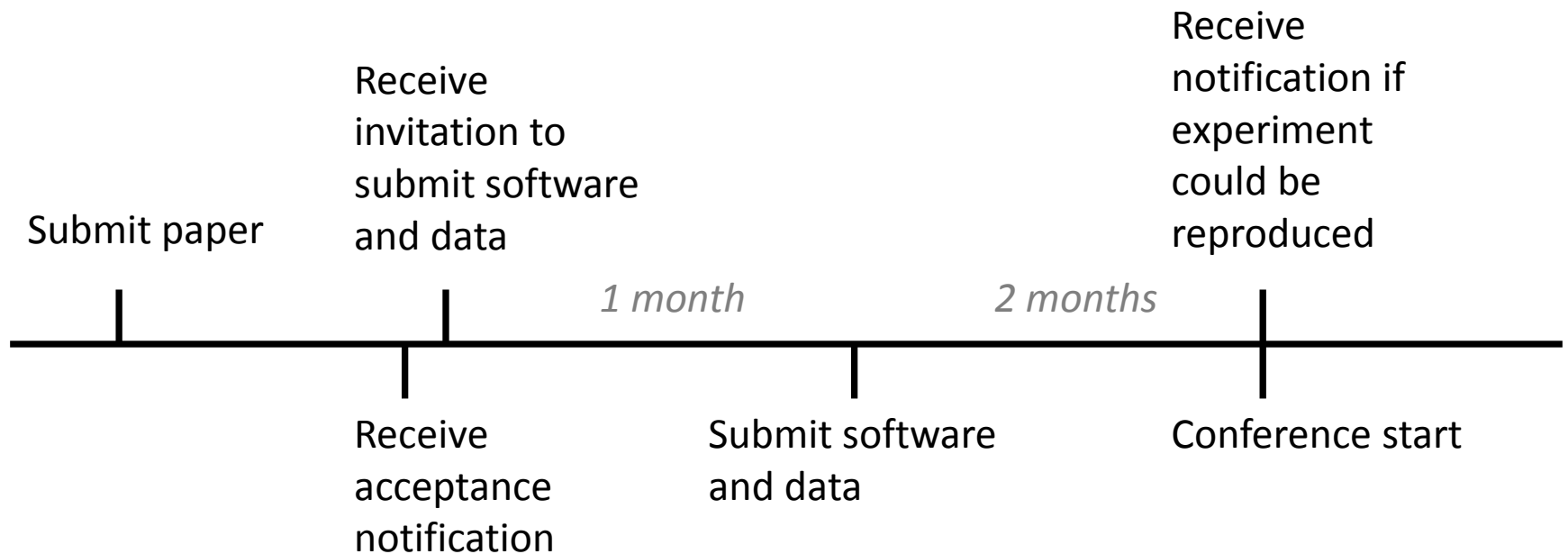
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SIGMOD ‘Experimental Reproducibility’ 2012 awards:

- ***Reproducible Label***: The experiments reproduced by the committee support the central results reported in the paper.
- ***Sharable Label***: The experiments are made available to the community and they have been tested by the committee - a URL is provided.*

<http://www.sigmod.org/2012-staging/reproducibility.shtml>

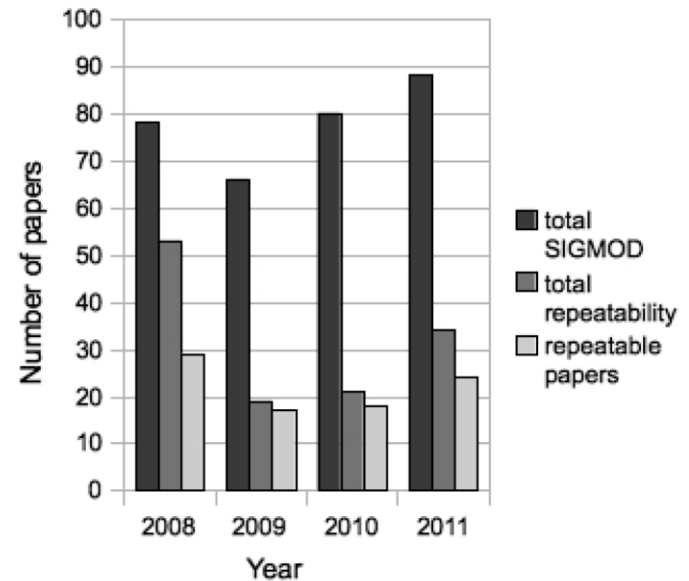
Process



Reproducibility committee SIGMOD 2011 - Results

Labels: Repeatable, Workable

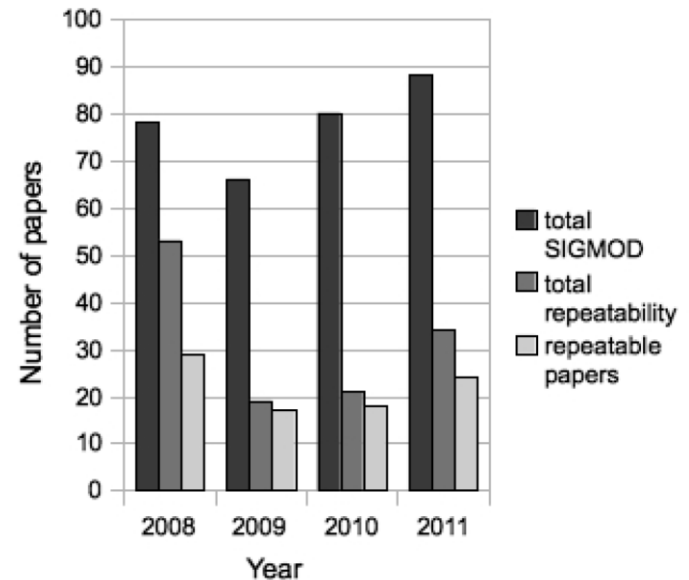
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- 25% Repeatable



Reproducibility committee SIGMOD 2011 - Results

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Will be implemented by VLDB conference in 2013!

So...

- Would you participate in the process?
- Do you believe, such a process fit to judge research in visualization?
- Do you have a totally different approach in mind?

Thanks!

Juliana Freire

Philippe Bonnet

Claudio T Silva

Bob Laramee

William Schroeder

Mike Kirby

Timothy Lebo

SIGMOD

Reproducibility Committee

Verification in

Visualization: Building

a Common Culture,

VisWeek Panel 2011