

# Software Life Cycle / Software Engineering Track Summary

Liz Sexton-Kennedy and Jeff Carver



# Session Contents

09:00 → 10:30

Parallel Session - Software Life Cycle / Software Engineering

🕒 1h 30m 📍 McDonnell Hall 103



## Introduction

🕒 20m



**Speakers:** Elizabeth Sexton-Kennedy (Fermi National Accelerator Lab. (US)) , Jeffrey Carver (University of Alabama)

[Viewable link to ...](#)

## Lightning Talk: An Update on Software Citation

🕒 5m



**Speaker:** Daniel S. Katz (University of Illinois)

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## Lightning Talk: Software Amoebas

🕒 5m



**Speakers:** Douglas Thain , Douglas Thain (University of Notre Dame)

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## Lightning Talk: Generating All the Things: Using Code Generation to Transform Scientific Knowledge to Software Artifacts

🕒 5m



**Speaker:** Spencer Smith

DrasilPoster.pdf

## "Petabyte Databases"

🕒 5m



**Speaker:** Peter Elmer (Princeton University (US))

["1997"](#)

## Lightning Talk: Static Analysis Tools

🕒 5m

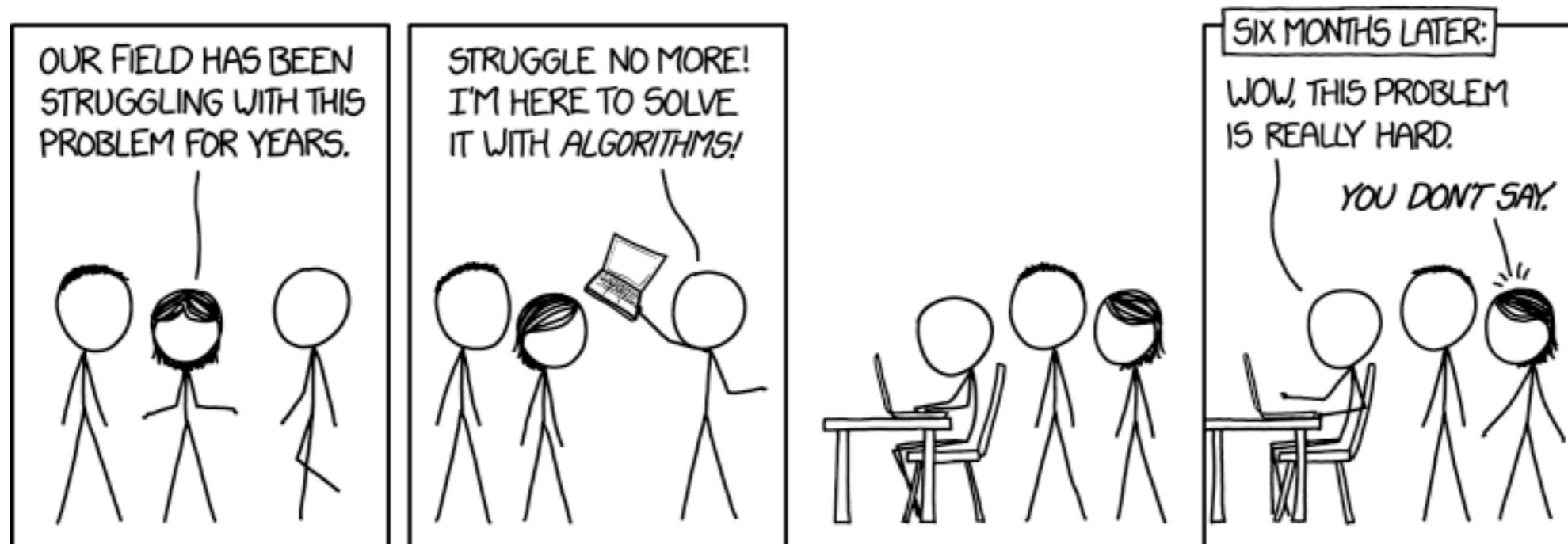


**Speaker:** Christopher Jones (Fermi National Accelerator Lab. (US))

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# Introduction

- I reviewed what CMS (which I claim is very much like ATLAS) does in the domain of SoftwareLifeCycle and SoftwareEngineering
- Comment from Jeff



# General Questions

- Are there places where the HEP language to describe a problem or system doesn't match how a CS person would describe the same problem?
  - Doug: Yes, in the process of data reduction. Eg: Skimming, slimming -> selection, projection
- Which things does the HEP community want to do, does not know how, and believes that Computer Scientists may be able to figure out?
  - Chris' presented a thread safety tool idea. This lead to a discussion, "is C++ the right language for concurrency?"

# General Questions - 2

- Effective documentation process and tools for developers, can we do better than Doxygen?
- Evaluation of our software engineering processes looking backward and forward, quantify the evaluation. How can the Institute evaluate/measure the impact of various practices on “productivity” (however that is measured)?
- “Forensic” processes for understanding complex code bases. However it should be noted that it does not require understanding the full code base in order to contribute to it’s applications.
- How to maintain an evolving matrix of software versions and architectures? the central applications of the experiment.

# General Questions - 3

- How do these problems map to CS research questions?
  - Application of code and documentation generation with DSLs
  - How do you distribute and manage large software stacks with large dependencies, is CVMFS it? Will it be enough for HL-LHC?
  - Problems being solved have to be generalizable to the larger community.
- Are there CS workshops/meetings on these questions which HEP people should consider attending?
  - Supercomputing, SC17, VLDB, PEARC=HPC+HTC, International conference in data engineering =ICDE
  - ICSE = int conf on soft eng
  - eScience = IEEE int conf on eScience
  - Software Engineering for Science workshop series (<http://www.SE4Science.org/workshops>)

# Specific Questions

- For a small software project, how does one reasonably understand the cost/benefit of various software engineering techniques?
- E.g. If I have one programmer and a grad student, how much of my effort is worthwhile to spend on adding new tests versus developing software?
- Can the HEP institute help small projects to make this tradeoff suitable? Or, are there other existing resources that the HEP institute should point the community to? (e.g, the UK Software Sustainability Institute best practices)
- Miron Livny: To what extent are design documents used in HEP software? Does this engineering approach add value to SW development?
  - A: we don't do this well.

# Summary

- It was a productive session, for more details especially about the lightning talks see our live notes page:
- [https://docs.google.com/document/d/1gWNNJ77xmbwYTY\\_XrJI0xcXPfXDOgP92qMHMDCBDxp8/edit](https://docs.google.com/document/d/1gWNNJ77xmbwYTY_XrJI0xcXPfXDOgP92qMHMDCBDxp8/edit)

<https://docs.google.com/presentation/d/1m9kOuy6hoVxPIWikV0Tky7VGYRRXML-O9HgmBxHQpz4/edit?usp=sharing>

# Backup Slides