

Designing and Presenting Programming Languages in the Broader Research Community

A Case Study of Three Parallel Programming Languages

CS 6610
23. November 2015

Assigned Readings: Spend most of your time on the RAPID paper, but be prepared to discuss all three papers. Pay particular attention to each paper's structure and high-level concepts.

- Angstadt, Weimer, and Skadron's *RAPID Programming of Pattern-Recognition Processors*, ASPLOS '16 (to appear)
- Frigo, Leiserson, and Randall's *The Implementation of the Cilk-5 Multithreaded Language*, PLDI '98
- Hnat, et al.'s *MacroLab: A Vector-based Macroprogramming Framework for Cyber-Physical Systems*, SenSys '08

Discussion Preparation: For each paper, be able to answer the following questions:

1. Who is the audience of this paper?
2. What is the hardware target for this programming language?
3. What is the problem being addressed?
4. Why are current programming techniques not good enough? Why do we need a new language?
5. What are the primary contributions of the paper (according to the authors)?
6. What features (e.g. keywords, data structures, etc.) are unique to this language? How many are there?
7. How do the authors introduce and describe language features? Are any techniques discussed previously in class employed?
8. What techniques (at a high level) are used to produce efficient executables on the target hardware?
9. What is the role or purpose of the run-time system?
10. How is the language evaluated? What metrics are used, and what do they measure?