

Approximate Computing

Promise or Hype?

25 April 2016

Today

- approximate computing
- logistics
- how to's

Ask Questions!

Why Approximate Computing?

Moore's 'law': double # transistors every ~2 years

Dennard's scaling: as transistors get smaller their power density stays constant

but: demand is still increasing



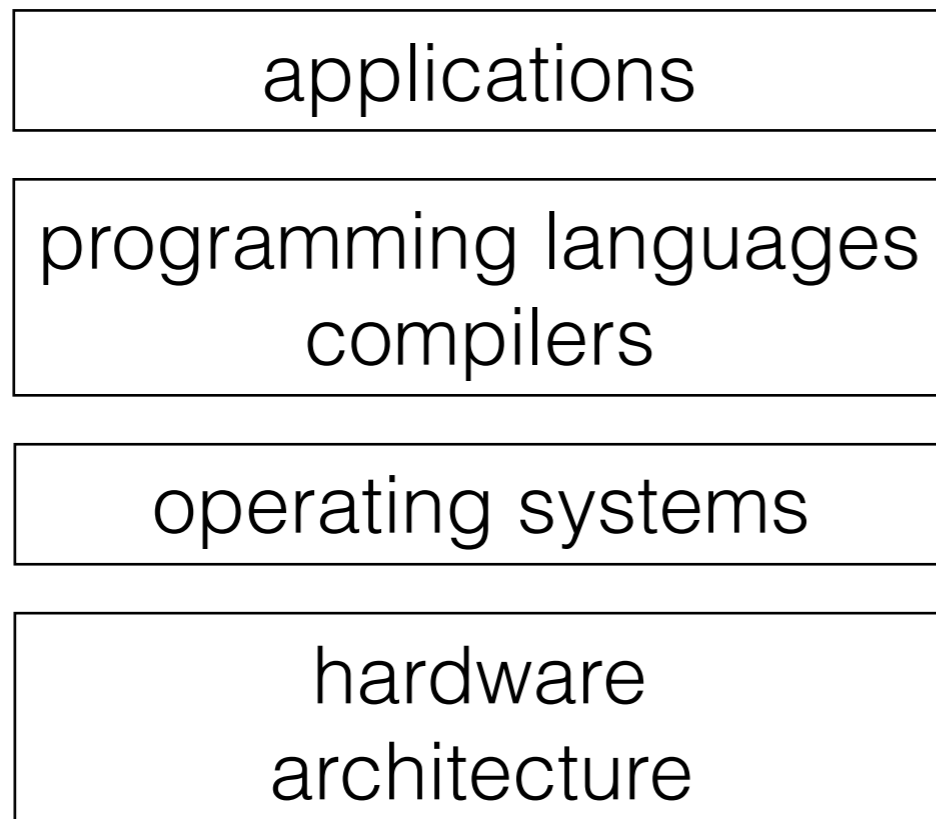
Intentionally produce **imprecise** results

going the 'last mile' is often disproportionately expensive

What is Different?

- not approximate algorithms
- not error resilient systems
- approximate applications where we *could* compute the 'exact' result

Across the stack



Possible approximations?

Robust Applications

- What *cannot* be approximated?
- What can be approximated?

Learning Outcome

- become familiar with challenges & techniques in approximate computing
- read research papers critically
- write useful reviews
- present research
- evaluate research critically

Logistics

- E 1.5, room 005, Monday 16:15 - 17:45
16 May holiday, no class
- website: <http://courses.mpi-sws.org/approx-ss16>
- mailing list: approx-ss16@mpi-sws.org
for announcements and general discussions
- HotCRP conference system: approx-ss16.mpi-sws.org
for paper discussions and reviews
- office hours: Tuesday 15:00 - 17:00, or email me
- grading
 - 30% presentation
 - 30% reviews
 - 10% participation (in class or on HotCRP)
 - 30% project

Part 1: Research Papers

- one 'author' per paper
20min presentation
- three reviewers per paper
reviews until Sunday night before class
- for everyone else
pick one of the two papers and read in detail, skim the other
prepare at least one question for each paper
- for everyone
participate in class discussion
paper discussion on HotCRP

Part 2: Projects

- during July
- small groups
- outcome: short report and presentation
- goal: critically evaluate/test/compare techniques seen in part 1
- more details later, but start thinking about it!

HotCRP

APPROX'SS16

Search: in

Reviews: The average PC member has submitted 0.0 reviews. ([details](#) · [graphs](#))

The review deadline is 1 May 2016 12:59:59pm CEST.

As a PC member, you may review [any submitted paper](#).

[Review preferences](#) · [Offline reviewing](#)

► **Recent activity**

- you will be PC members
- you can see and comment on all papers
- if you are a reviewer, you need to complete your review before seeing other reviews and comments
- review assignments are through HotCRP

How to Read a Paper

and take something away from it too

for everyone, not just presented and reviewer:

- keep notes, questions as you read
annotate the paper, or whatever suits you
- try to summarise it with your own words
don't copy or look at the abstract
- make a list of pro's & con's
- What are the key ideas and insights?
may not be the same!
- What is new?
you don't have the background, but try to 'guess' from the paper itself

How to Write a Review

- read the paper in full
- brief summary
 - what is the problem?
 - what is the solution?
 - does it work? how is it evaluated?
- your judgement (“comments for author”)
 - does it make sense? is the problem important? is the solution novel?
 - what is good first
 - what is not so good
 - limitations, assumptions, extensions
- paper presentation
 - is the paper understandable?
 - what could have been improved?

How to Write a Review 2

Conference reviews usually include ratings

We'll do them just for fun

- Overall Merit

usually: strong accept, accept, weak accept, reject

- Reviewer expertise

no familiarity, some familiarity, knowledgeable, expert

How to Make a Good Presentation

- 15-20min max (please stick to the time!)
- imagine: you are the author and you are very excited
- example structure
 - motivation: what's the problem? why do we care?
 - key ideas a.k.a. contribution
 - details
 - evaluation

How to Make a Good Presentation

there's an exception to every rule,
but if in doubt:

- black on white
- few colors
- less (stuff on the slide) is more
- you may copy figures from the paper
- special effects only when necessary

Discussions

Goal: get a better understanding of the paper

- Everyone prepares one question for each paper
- There are no stupid questions
- Be fair and nice