Improving Your Technical Presentation Skills

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- Education
  - Bachelor's degree in Electronics from Indian Institute of Technology, Madras, India
  - Master's and Ph.D. in Electrical and Computer Engineering from Rice University, Houston, Texas
- Research Areas: Computer systems: architecture, hardware/software interface, parallel and distributed systems
- Post-Ph.D.
  - Research scientist at Rice
  - Faculty member at University of Rochester
    - Currently the Albert Arendt Hopeman Professor and Chair of Computer Science with a secondary appointment in Electrical and Computer Engineering
  - Sabbaticals at IBM Watson, HPCLinks/IISc India, EPFL Switzerland

Why do Presentations Skills Matter?

- Essential for
  - Crystallizing your ideas
  - disseminating important results
    - Ideas don't sell themselves; they will lie on the shelf and gather dust unless you sell them
  - Explaining your work to colleagues
  - Giving talks/seminars in industry or academia
  - Selling your ideas to funding agencies (or venture capital firms)
  - Interviewing for jobs
  - Teaching

Presentation Skills

- Written
- Oral

Oral Presentation: The Three MUST HAVES

- Content: know your material ***really*** well
- Design: Organize the material and create a high-quality presentation (usually, for formal research talks, in the form of slides)
  - Drive home key points
  - Visualize what you are saying
- Delivery: plan your oral presentation/what you will say along with each slide
  - practice, practice, practice

Content: Know Your Material

- Do you have sufficient motivation for the work?
- What is the state of the art?
- What is your contribution/approach? How is it novel?
- Is the work mature enough for presentation/have you ironed out the corner cases?
- How sound are your results and analysis?

Remember: you are the expert (have chosen to become one): now you need to project that image

Design: Organize Your Material

- What are the key points you want your audience to remember?
  - Keep it simple
  - Repeat them: tell them what you're going to tell them (forecast) and why, tell them, and tell them what you told them (summary)
- Is your presentation at an appropriate level for your audience?

Delivery

PRACTICE, PRACTICE, PRACTICE!

Build your confidence; get feedback; form a support group; return the favor

Know Your Audience and Purpose

- Who is your audience? Why are they there? What do they know? What biases do they have?
- What is the purpose of your talk?
  - To inform? To persuade? To inspire? To teach?
- Is this a formal or informal occasion? What is the size of your audience? How much time do you have?

Conference Talks

- Remember
  - There is no way you will cover every detail of a 10 page paper in 25 minutes
  - The main goal is to get the audience interested in your work so they go read the paper
  - The talk is that sales job (but don't overdo the selling)

A General Talk Outline (20-25 mins.)

- Title/author/affiliation (1 slide)
- Motivation and problem statement (1-3 slides)
- Related work (0-1 slides)
- Main ideas and methods (7-8 slides)
- Analysis of results and key insights (3-4 slides)
- Summary (1 slide)
- Future work (0-1 slide)

How to Give a Bad Talk: The Ten (9) Commandments*

- Thou shalt not waste space
- Thou shalt not be neat
- Thou shalt not covet brevity
- Thou shalt not write large
- Thou shalt not use color
- Thou shalt not illustrate
- Thou shalt not make eye contact
- Thou shalt not skip slides in a long talk
- Thou shalt not practice

*Courtesy David Patterson, circa 1983, via Mark Hill, with appropriate modification to accommodate changes in technology

Thou Shalt Not Covet Brevity

- Do not omit technical material from your paper
  - You did the work; it is important; make sure the audience understands all nuances of approach and also how smart you are
  - Many in audience will never read the paper – they *must* leave the room fully understanding your approach, motivation, and contributions!
- Include lots of material in each slide
  - Avoid sentence fragments because they may make you look illiterate.
    - Also, if the slides have full sentences, then you can read the slides verbatim and audience will be able to follow along.
    - All points you make orally should also be on the slide, and vice versa.
    - Some may say that no item on a slide should span more than one line. Ignore this! Take as much room as you need to make your point.
    - Take advantage of technology – small fonts allow you to provide information-rich slides.
      - Fonts smaller than 24 point are fine
      - And the important people sit in front anyhow!
    - Make several points on each slide.
- Include lots of slides in each talk
  - 1 Lampson = 1 slide per second
  - Impress audience with intensity and difficulty of material
    - They should leave knowing that you did a lot of work and that it was hard, even if they don't understand all of the details.
  - Avoid moving content to "backup slides"
    - You probably won't get a chance to show many of them

Slide Design

- 3 is the golden number (almost!); 3-5 bullets or points per slide
  - Don’t overcrowd
  - Make sure font is legible even in your figures (test it out in a room of similar size)
  - Spell and grammar check!
  - No need for complete sentences, but be consistent in your style and format

Outline Slide or No Outline Slide: To be or not to be

Roadmap

- Background
- Design
- Evaluation
- Conclusion

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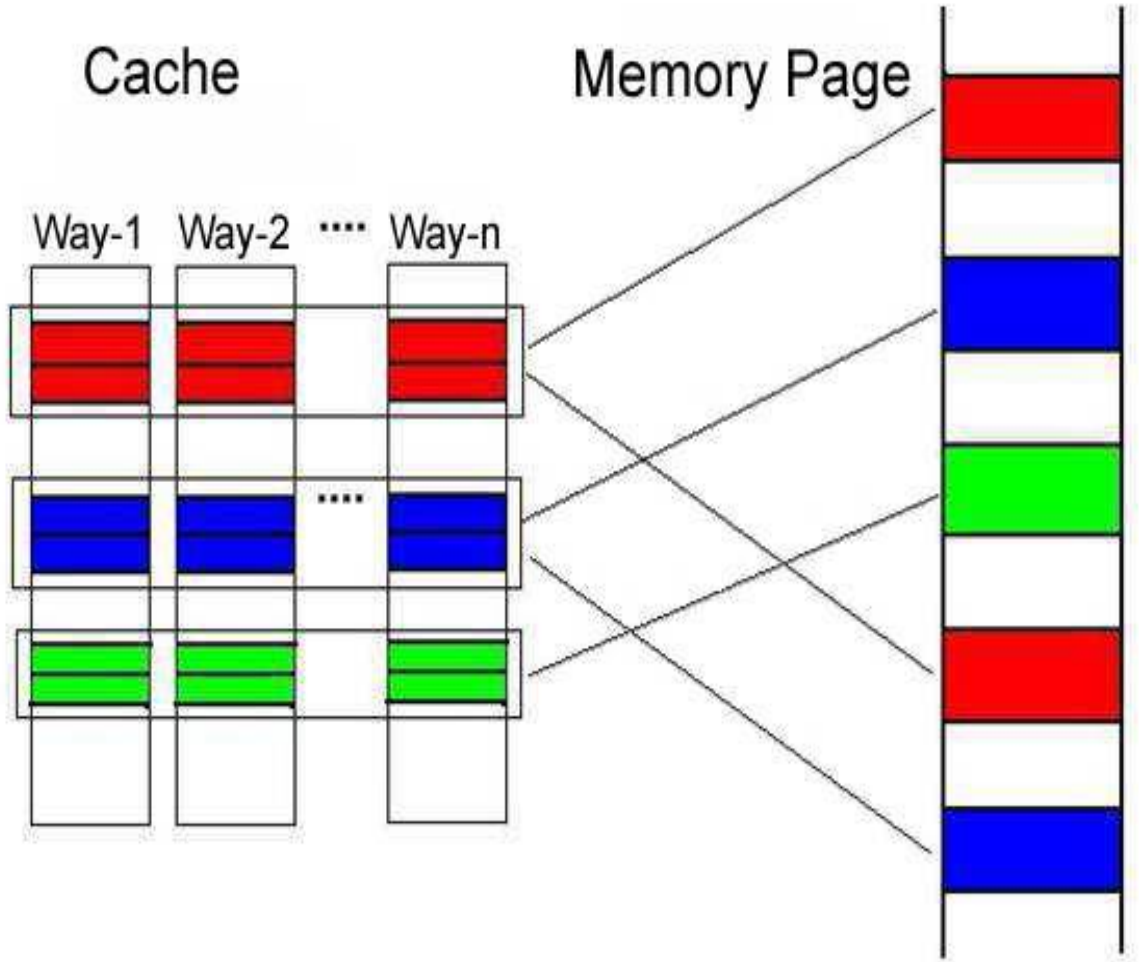
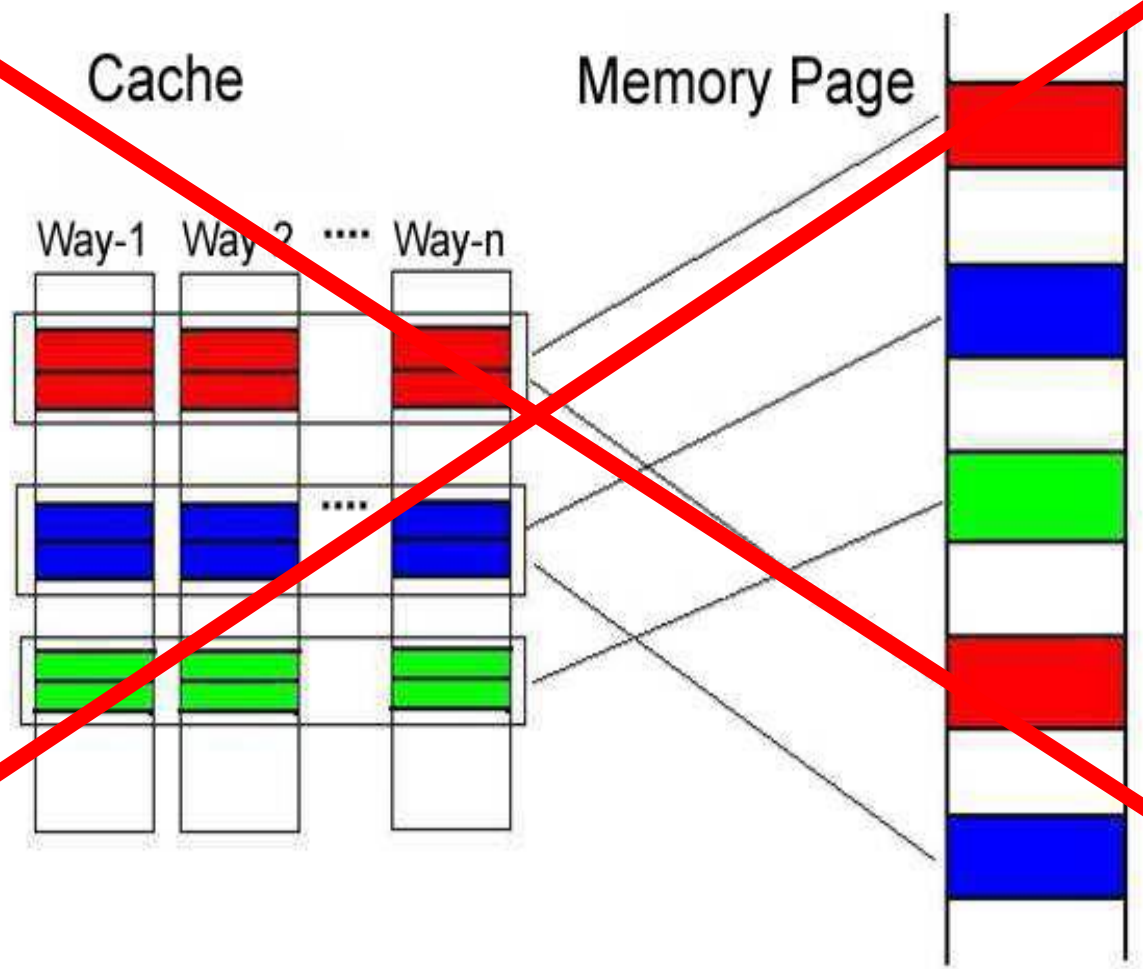
Background:
Brief Introduction of Page Coloring



Background:
Brief Introduction of Page Coloring

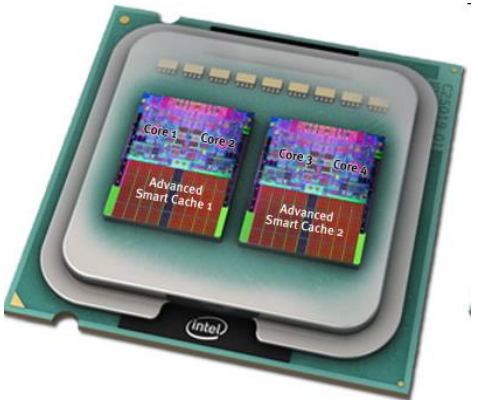


Instead …

The Multi-Core Challenge

- Multi-core chips
  - Dominant on the market
  - Last level cache is commonly shared by sibling cores, however sharing is not well controlled

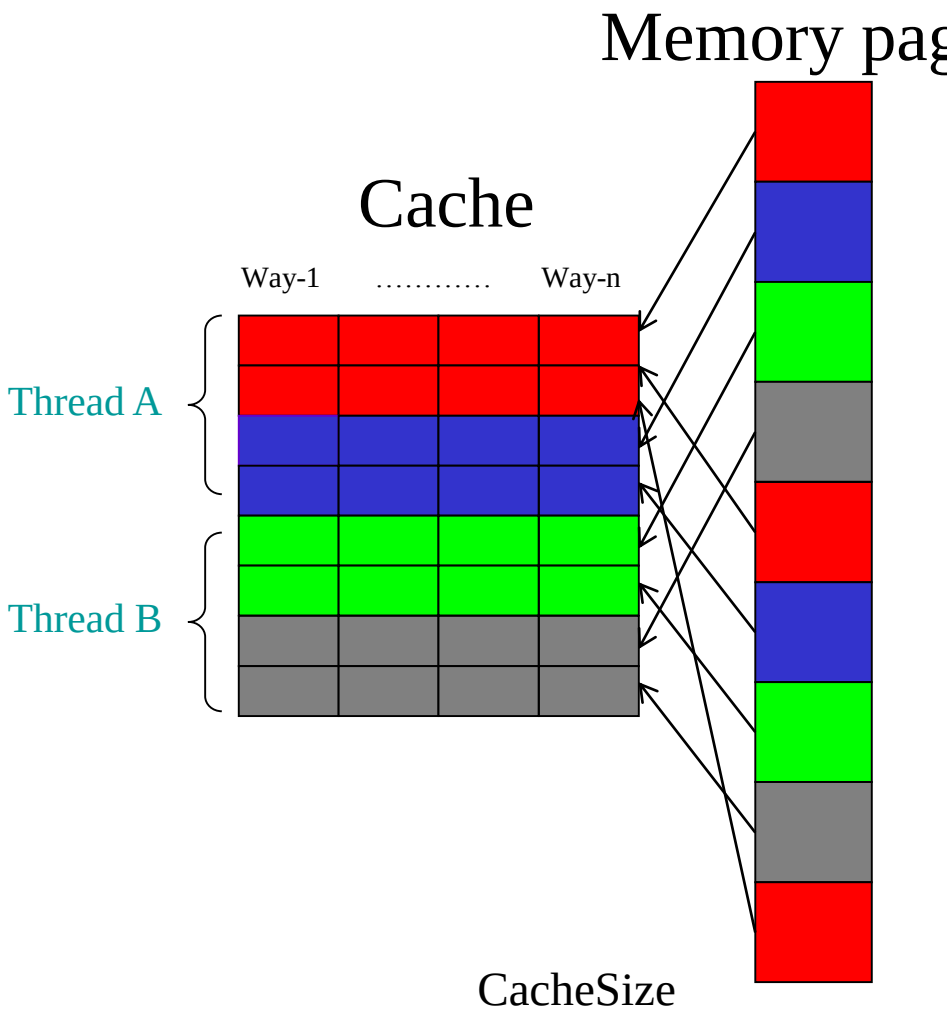
- Challenge: Performance Isolation
  - Poor performance due to conflicts
  - Unpredictable performance
  - Denial of service attacks



Picture courtesy Intel

Possible Software Approach: Page Coloring

- Partition cache at coarse granularity
- Page coloring: advocated by many previous works
  - [Bershad'94, Bugnion'96, Cho '06, Tam '07, Lin '08, Soares '08]
- Challenges:
  - Expensive page re-coloring
    - Re-coloring is needed due to optimization goal or co-runner change
    - Without extra support, re-coloring means memory copying
    - 3 micro-seconds per page copy, >10K pages to copy, possibly happen every time quantum
  - Artificial memory pressure
    - Cache share restriction also restricts memory share



$$\text{Color \#} = \frac{\text{CacheSize}}{\text{PageSize*CacheAssociativity}}$$

Hotness-based Page Coloring

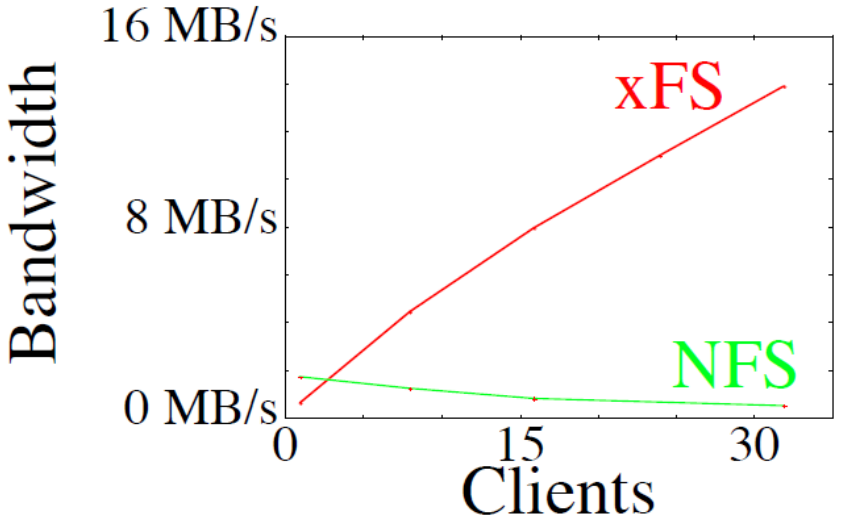
- Basic idea
  - Restrain page coloring to a small group of hot pages
- Challenge:
  - How to efficiently determine hot pages

Roadmap

- Efficient hot page identification
  - locality jumping
- Cache partition policy
  - MRC-based
- Hot page coloring

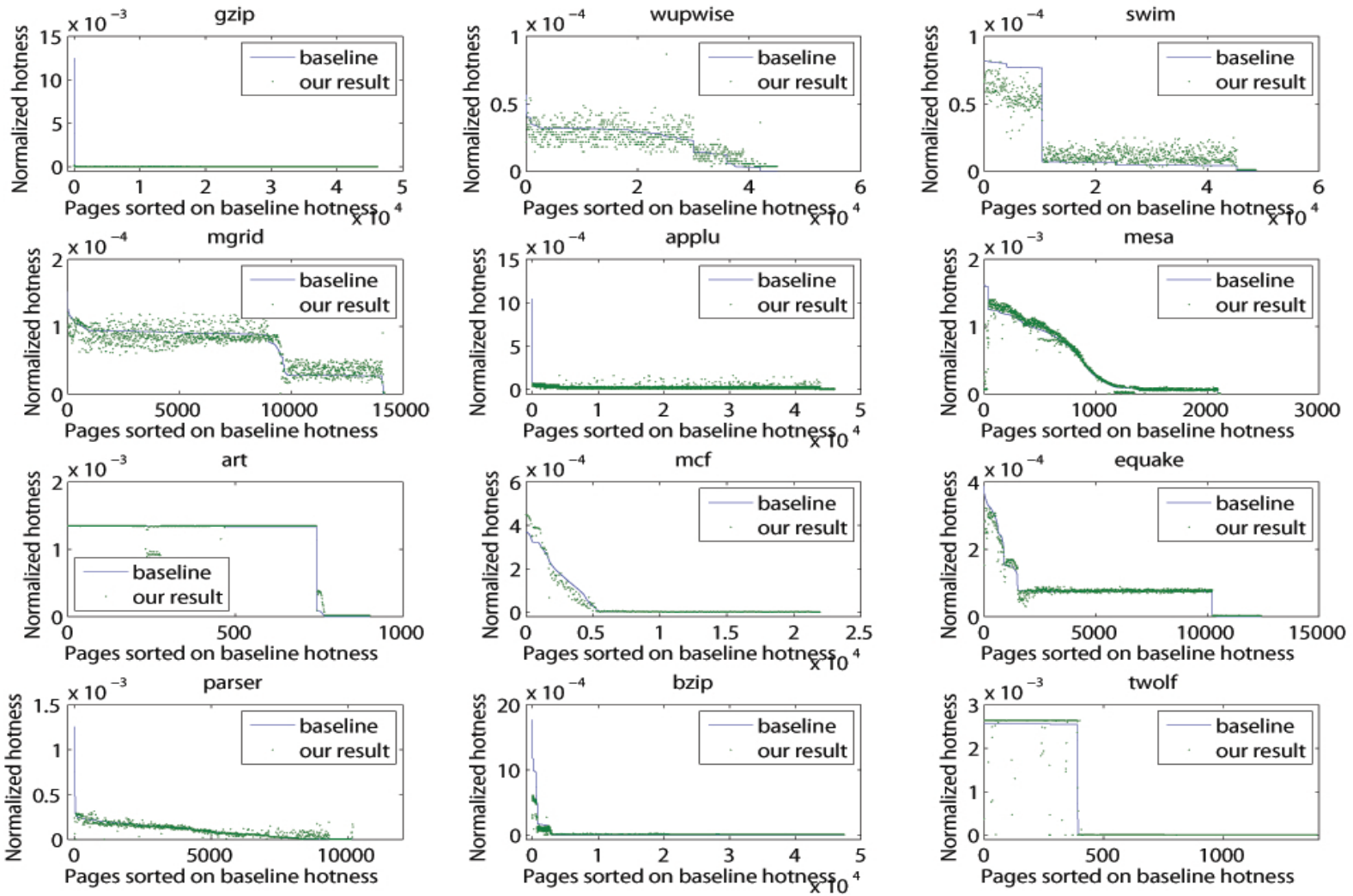
Thou Shalt Not Illustrate

Clients	xFS BW	NFS BW
1	5.71995e+05	1.65997e+06
8	4.425325e+06	1.19731e+06
16	1.095445e+07	7.88792e+05
32	1.38927e+07	4.70548e+05



- Table:
  - Precision?
  - Allow audience to draw their own conclusion
- Pictures:
  - Worth a thousand words (or numbers)?

Accuracy



URCS

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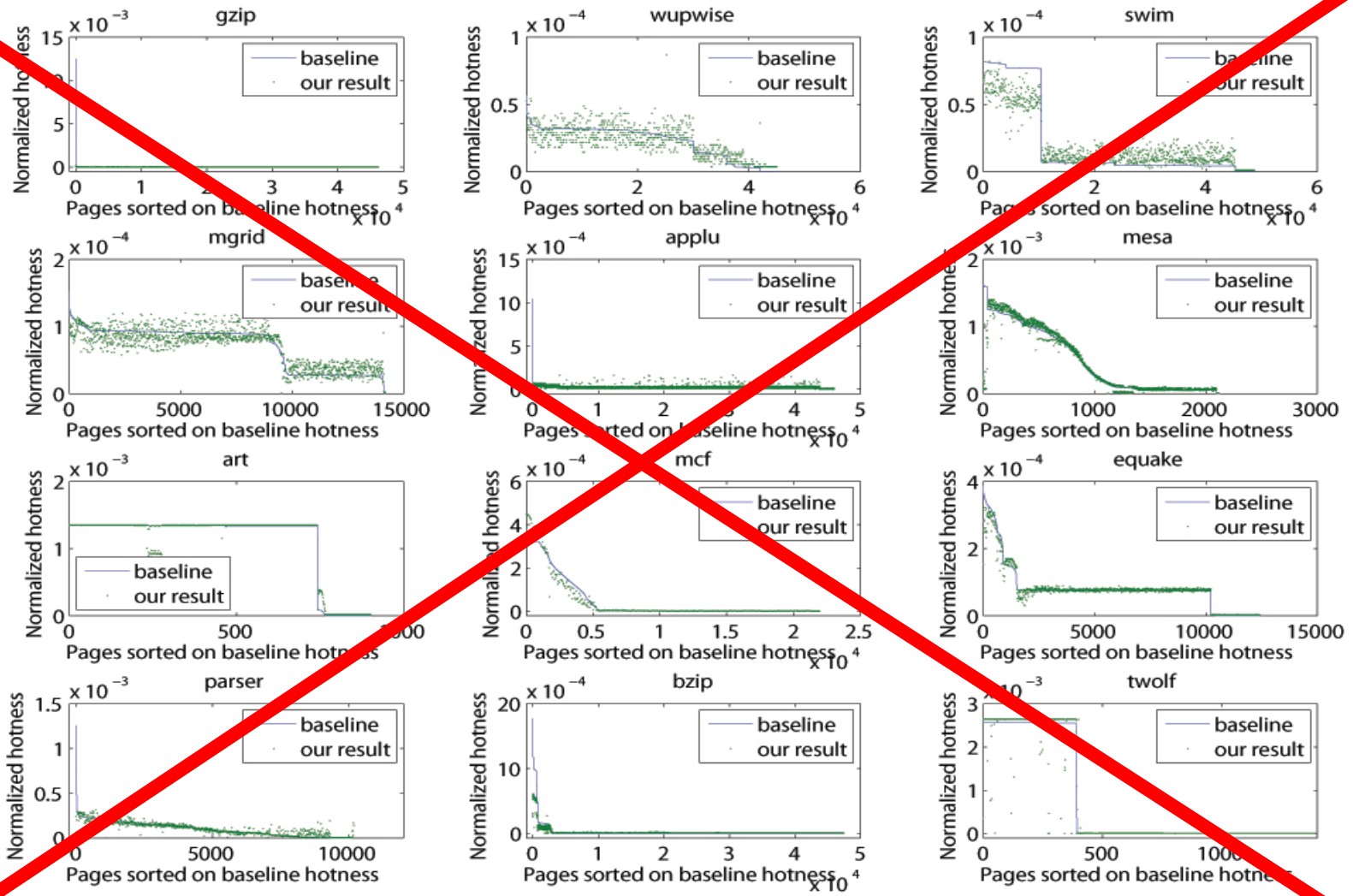
Accuracy


gzip
wupwise
swim
mgrid
applu
mesa
art
mcf
equake
parser
bzip
twolf
baseline
our result
Normalized hotness
Pages sorted on baseline hotness

Instead …

Hot Page Identification Accuracy

- No major accuracy loss due to jumping as measured by two metrics (Jeffrey divergence & rank error rate)
- Result is fairly accurate

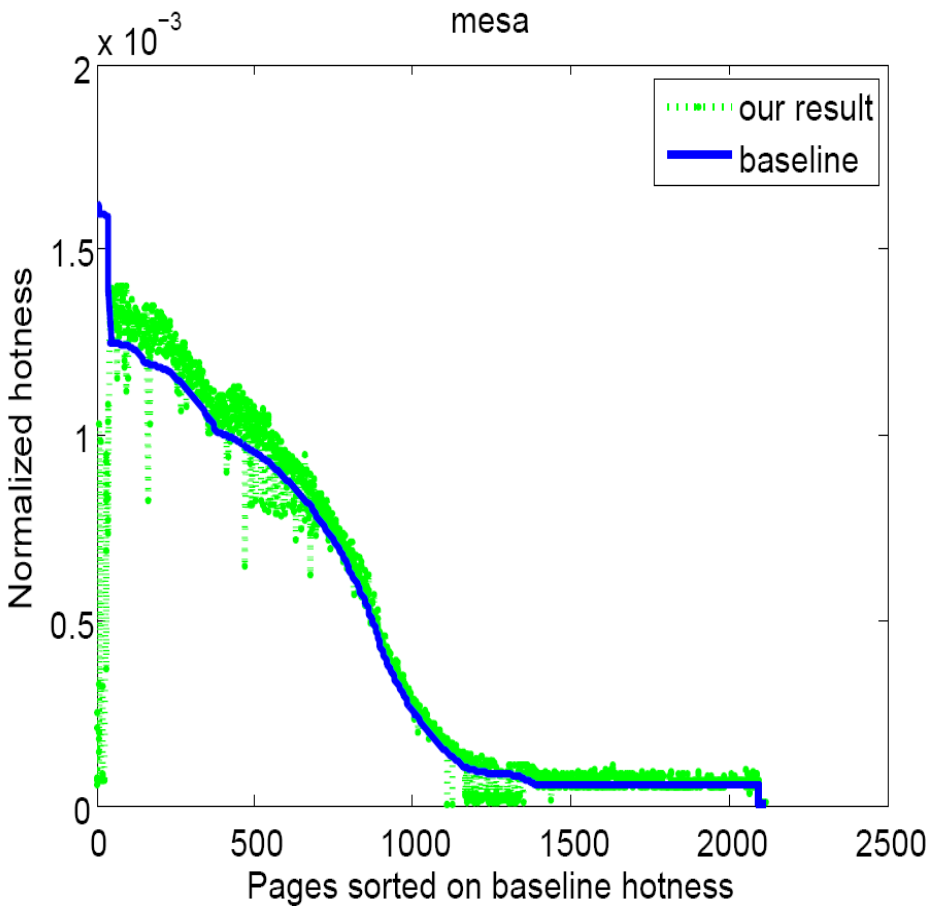


Illustration and Color

- "A picture speaks a 1000 words"
  - A 1000 words don't speak, however
  - The picture may need a little help
- Color for emphasis (when appropriate)
- Animation when appropriate

Re-coloring Procedure

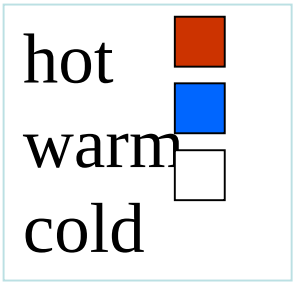
- Quick search for *K*-th hottest page's hotness
  - *Bin[i][j]* indicates # of pages in color *i* with normalized hotness in
  - *[j, j+1]* range

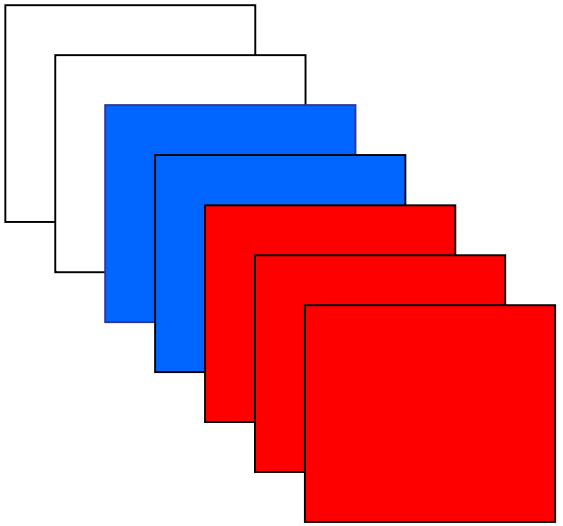
procedure *Recolor*

budget (recoloring budget)
old-colors (thread's color set under old partition)
new-colors (thread's color set under new partition)
if *new-colors* is a subset of *old-colors* **then**
subtract-colors = *old-colors* – *new-colors*.
Find the hot pages in *subtract-colors* within the *budget* limit and reallocate to *new-colors* in a round-robin fashion.
end if
if *old-colors* is a subset of *new-colors* **then**
add-colors = *new-colors* – *old-colors*.
Find the hot pages in *old-colors* within the $\frac{|new\text{-}colors|}{|add\text{-}colors|} * budget$ limit, and then move at most *budget* (*i.e.* $\frac{|add\text{-}colors|}{|new\text{-}colors|}$ proportion) of them to *add-colors*.
end if

Instead …

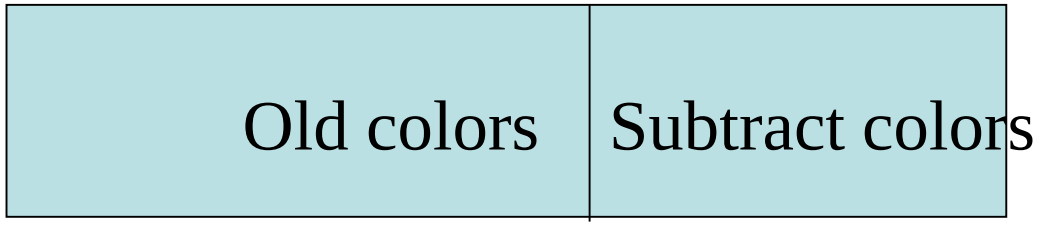
Re-coloring Procedure(I)



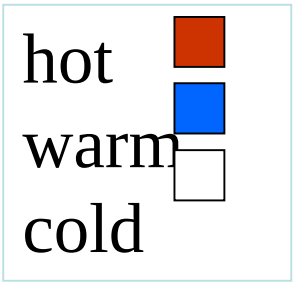


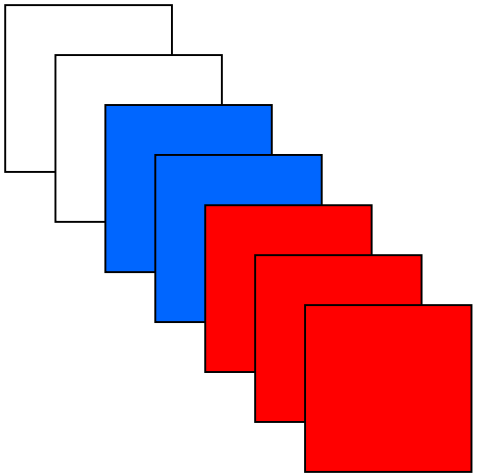
Cache share decrease

Budget = 2 pages



Re-coloring Procedure(II)





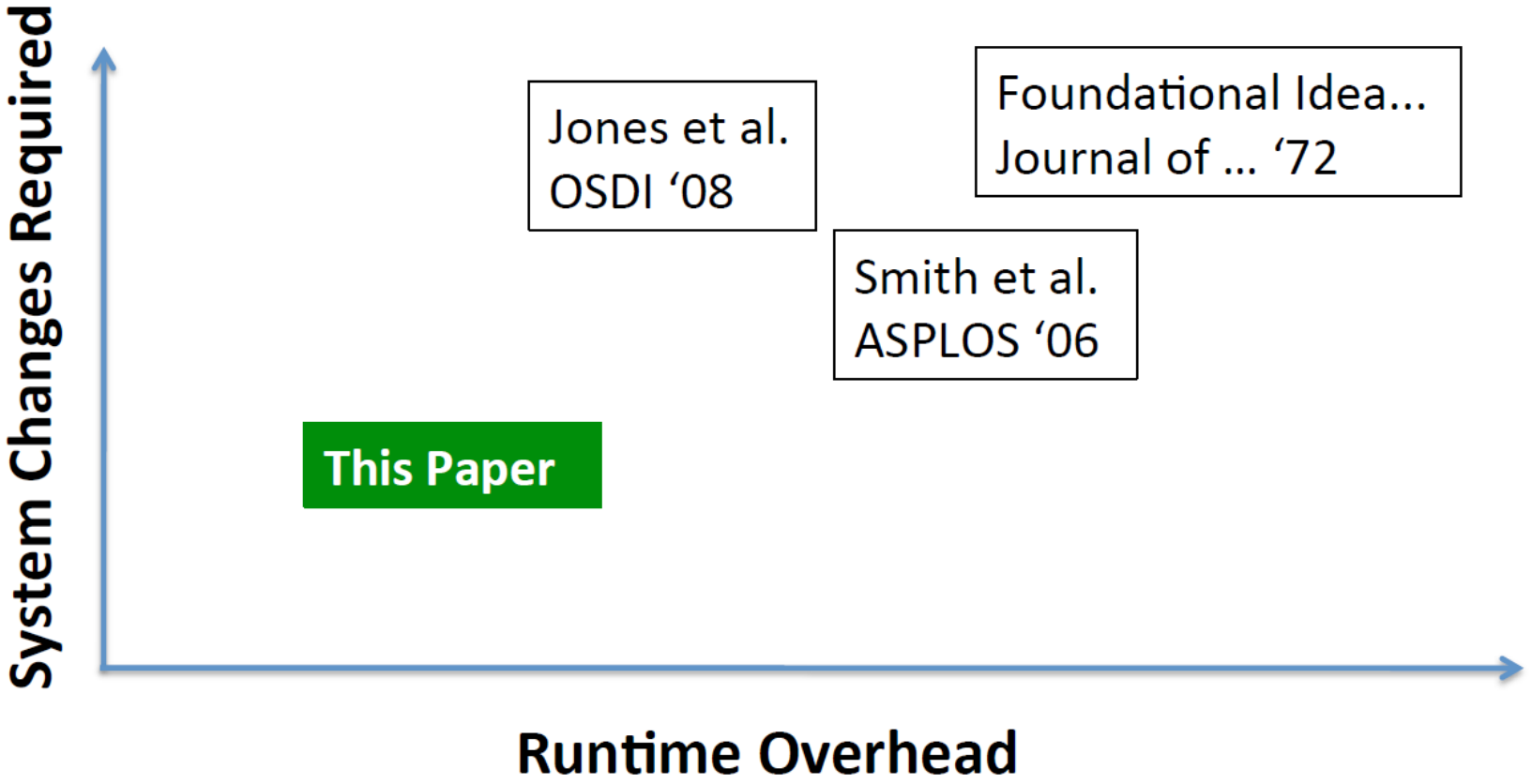
Cache share increase

Budget = 2 pages

Related Work – Version I

- "A reasonable approach to page coloring"
  - ASPLOS'06
- "Another page coloring idea"
  - OSDI'08
- "Yet another page coloring idea"
  - ASPLOS'07

Related Work – Version II



Spatial display of design space highlights your novelty or approach

Conclusions

- A chance to summarize and place your work in a broader context
- Open problems?
- Future work?

Delivery

PRACTICE, PRACTICE, PRACTICE!

Build your confidence; get feedback; form a support group; return the favor

Helpful Hints

- Record yourself and watch the video
- Enroll in a public speaking class
  - Toast masters, community courses
- Memorize first 5 minutes of your talk
  - Helps start out if you are nervous
- Leverage your nervous energy
  - Adrenalin can help you give a good talk

Plan Your Verbal Presentation

- Work on the flow
- Motivate the work
- What are the main points
- Reiterate the main points
- Summarize – tell them what you told them

Body Language

- Eye contact
- Fillers
- Gestures
- Enunciation
- Voice modulation and emphasis
- Speed of delivery
  - There's no prize for learning how to fit 20 words in 10 seconds
- Most of all, project your enthusiasm for what you are presenting!

Questions?

- Anticipate them
- Prepare backup slides
- Have a strategy for aggressive questioning
- Follow up

It Pays To Be Cautious!

- Redundancy/fault tolerance: make copies of your slides on a flash drive
  - Your computer may fail you
- Create versions in multiple formats for just in case
  - E.g., ppt and pdf
- Make sure you check the projection systems prior to your talk or session if at a conference
- Use practice talks to get possible questions
  - Be prepared with backup slides on details

Poster Presentation

- 1-2 minute presentation that addresses
  - What
  - Why
  - How/what's novel
  - Outcome
- Poster content
  - Once again, pictures speak a 1000 words
    - With some help from text
    - Don't overcrowd
    - Make sure the main points above stand out

Posters: Follow-Up Questions

- Be prepared to
  - Discuss approach in more detail
  - Discuss validation in more detail
  - Discuss limitations of your work
  - Discuss related work
  - Outline ongoing and future work

Writing Style

- Clear organization of individual ideas
  - Sections and paragraphs should have a logical flow
    - Define terms before you use them
    - Keep forward references to a minimum
  - Each section represents a high-level topic/organizational unit
  - Each paragraph contains a single idea with supporting details
  - Each sentence expresses a single point/detail
- Pay attention to detail – spelling and grammar

Good Presentation: The Three (actually, Four) MUST HAVES

- Knowledge of audience: know your audience, purpose, and constraints
- Content: know your material ***really*** well
- Design: plan what you want to say and how you will say it (both visual and auditory)
- Delivery: practice, practice, practice! … and use feedback you receive to improve

Useful Resources

- Mark Hill's "Oral Presentation Advice", http://pages.cs.wisc.edu/~markhill/conference-talk.html
- CRA-WP, https://cra.org/cra-wp/grad-cohort-for-women, https://cra.org/cra-wp/grad-cohort-for-urmd/
- http://www.randsinrepose.com/archives/2008/02/03/out_loud.html
- http://www.slideshare.net/selias22/taking-your-slide-deck-to-the-next-level
- Michael Alley: "The Craft of Scientific Presentations", http://www.writing.engr.psu.edu/handbook/presvisuals.html