Designing and Presenting a Science Poster

Computing Sciences Summer Student Program

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Poster Sessions at Major Conferences

- **Sessions for attendees to mingle in an around posters and presenters**

- **Posters usually viewable any time the conference is in session**

- **Often there is a poster session or reception**

- **Often 100s of posters are presented**

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Presentations vs. Papers

Papers

- Single preplanned narrative
- Text & figures
- Remote audience
- Reader can study in their own time
- Few to many pages
- Limited interaction
- Supporting material can be conveniently linked, e.g. references, URLs

Presentations

- Single preplanned narrative
- Speech
- Captive audience
- 15+ minutes
- Multiple "slides"
- Fixed mode of interaction

Presentations vs. Papers vs. Posters

Papers
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Presentations
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Posters
- Discussion
- Multiple narratives
- Browsing audience
- ~5 minutes per discussion
- Single "slide"
- Supporting material can be provided, e.g. paper, tablet device, demo, etc.

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Basic Poster Content

- **Title**
  - Briefly convey the subject matter
  - Attract interest without gimmicks

- **Introduction**
  - Problem Statement (why it matters), avoiding as much jargon as possible

- **Methodology**
  - Not too much detail, graphics work well in many cases

- **Results**
  - What worked, what didn't
  - Brief data analysis

- **Conclusions**
  - Your interpretations (Don't repeat results)
  - Further work

- **Citations**

- **Acknowledgements**

- **Contact information!**

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Visual Communication

- Graphics to help you talk to your work

- Label graphs and charts legibly, and clearly enough that the label stands on its own

- Use different portions of poster to engage at different level of abstraction and separate logical concepts

Things to Avoid

http://sciencefair.math.iit.edu/display/layoutflow/
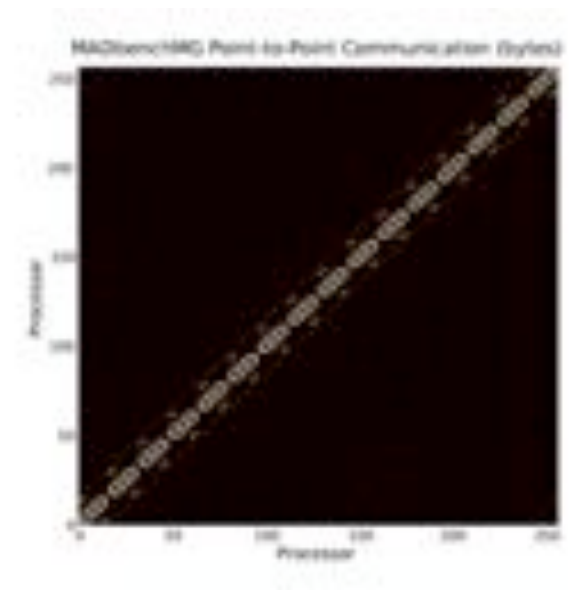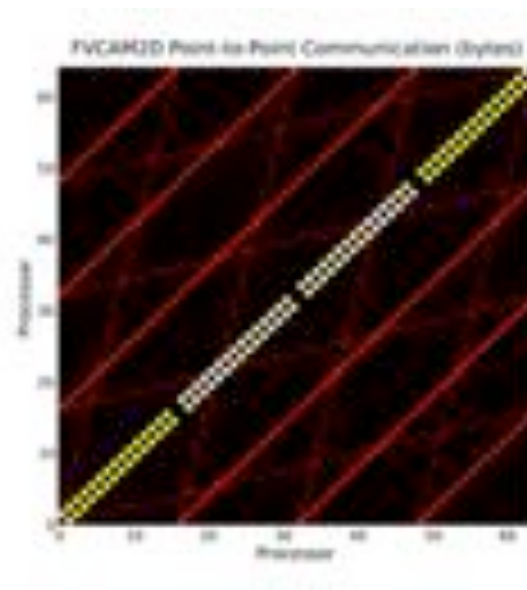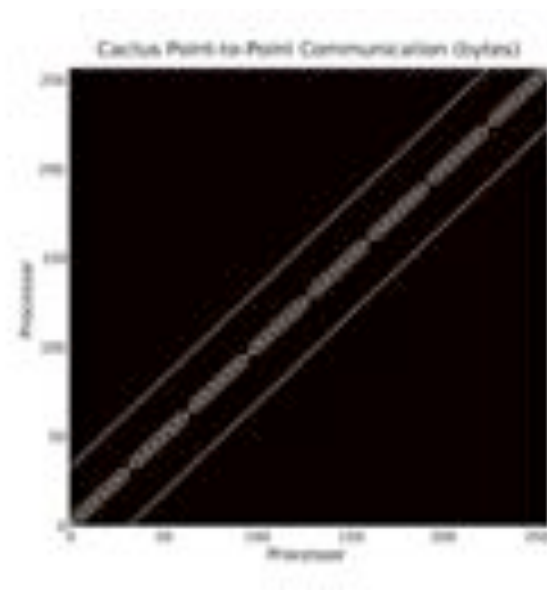
- **Too verbose**
  - Aim for 500-700 words

- **Avoid large blocks of text**
  - Consider using lists

- **Avoid over-crowded or busy layouts**
  - Flow is often confusing, or the eye doesn't know where to look

- **Avoid garish color schemes or awkward font choices**
  - Dark backgrounds can print poorly

http://bonfx.com/bad-typography/

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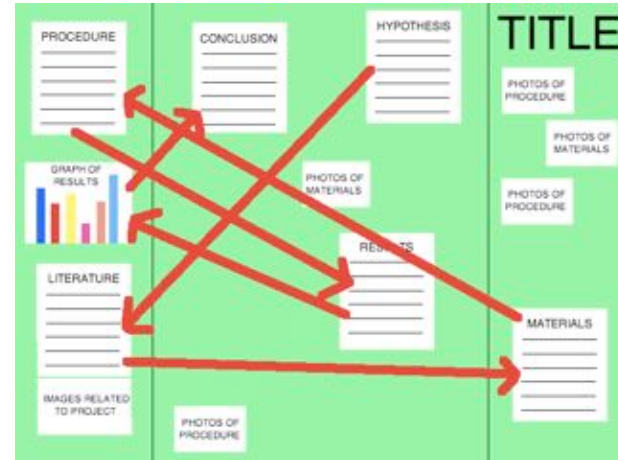
Bad Poster Bingo by Zen Faulkes

Different parts of poster don't line up	Boxes within boxes	Zigzag reading order	More than three typefaces	Long-winded title
Gradient fills in coloured boxes	Big blocks of text	Photographic background	Unlabelled error bars on graphs	Pixelated pictures
More than five colours	Institutional logos bookending title	Free space	ALL CAPITALS	Text with shadows, outlines, or bevels
Abstract	Underlined text	Comic Sans	3-D graphs	Checking tablet or phone during presentation
Tables showing data that could be in a graph	Poster does not fit on poster board	Comic Sans (it's that annoying)	Objects almost touching or overlapping	Tiny, unreadable type

Marketing Your Poster

- Make your poster compelling so it will stand out
  - "Title should be visible from the moon"

- Look like you want people to stop and talk

- Don't stand in front of your poster

- Make room for multiple visitors

- Talk to your visitors as opposed to your poster

- Think about auxiliary materials, e.g QR-codes, handouts

- Perhaps?

Coordinate your outfit with your poster: Keegan, D.A., and S.L. Bannister. 2003. Effect of color coordination of attire with poster presentation on poster popularity. *Canadian Medical Association Journal* 169:1291-1292

http://betterposters.blogspot.com/2012/03/colour-clash.html

Pink Guy with Pink Poster. Nicole Barker.

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Follow Poster Session Instructions

- Note format and size requirements

- Put up and take down your poster in a timely manner

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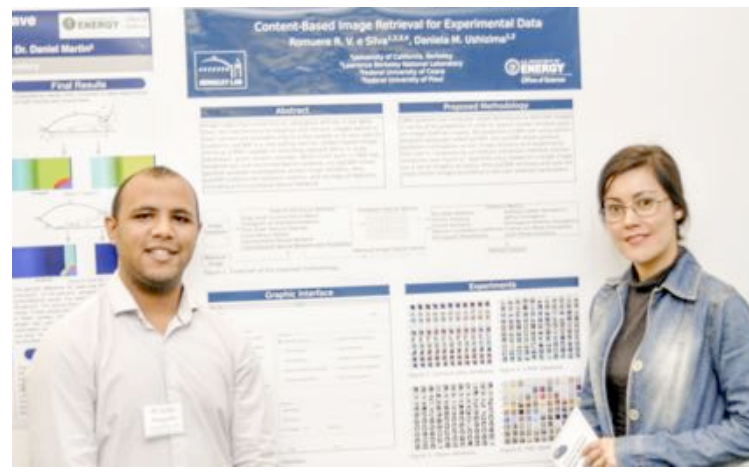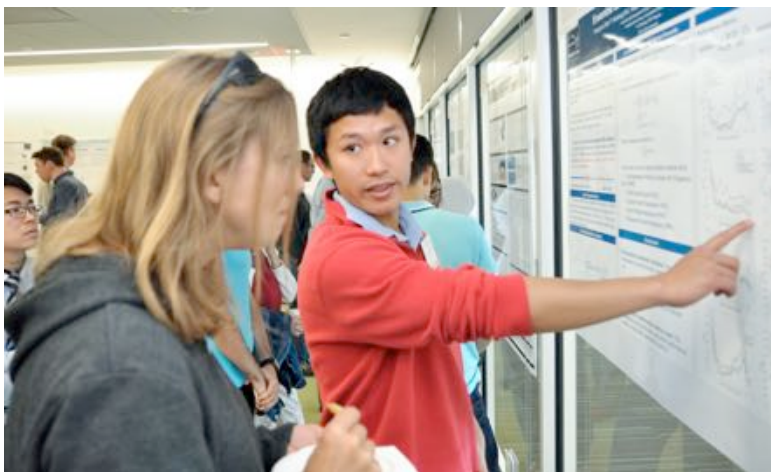LAWRENCE BERKELEY NATIONAL LABORATORY
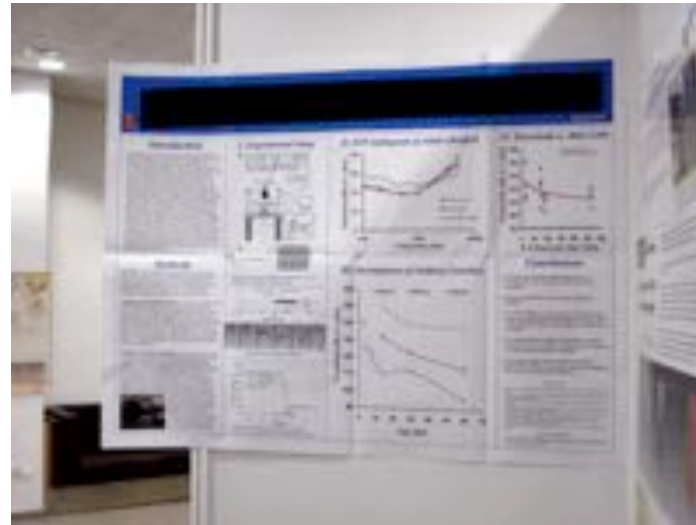
Software

- **Microsoft Powerpoint**
  - Frequent choice, optimized for slides rather than posters
- **Google Slides / Drawings**
  - Free with LBL account
  - Slides is similar to Powerpoint, Drawings is page composition software
- **LaTeX (many templates available)**
  - Favorite of mathematics typesetters
  - Open source
- **Scribus, Inkscape**
  - Page composition software
  - Open source
- **OmniGraffle (Mac and iOS)**
  - Primarily image generation
  - Limited feature version available free
- **PosterGenius**
  - Designed for posters
  - Free trial available

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Resources

- **Colin Purrington, Swarthmore College**
    - http://colinpurrington.com/tips/posterdesign
    - Suggestions for software, templates, and more…

- **Zen Faulkes**
    - http://betterposters.blogspot.com
    - Advice and poster critiques

- **George Hess, Kathryn Tosney, and Leon Liegel, North Carolina State University**
    - http://www.ncsu.edu/project/posters/
    - Suggestions on formats, style, poster elements, etc.

- **Michael Barton, Bioinformatics Zen**
    - http://www.bioinformaticszen.com/post/genotype-from-phenotype/

- **Many YouTube videos…**

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CS Summer Student Program Poster Session

- August 3rd, 10:00-12:00
- Bldg 59, Room 3101
- We expect ~40 posters
- High visibility for lab scientists in CS and elsewhere in the lab

CS Summer Student Program Poster Session

- **A great way to practice poster design and presentation**

Jessica Hatcher from Fort Valley State University in Georgia won a first place award for her research poster "Quantitative Structure Activity Relationships (QSAR) for Biological Effects of Synthetic Cathinones" at the 74th Joint Annual Meeting of The National Institute of Science / Beta Kappa Chi National Scientific Honor Society

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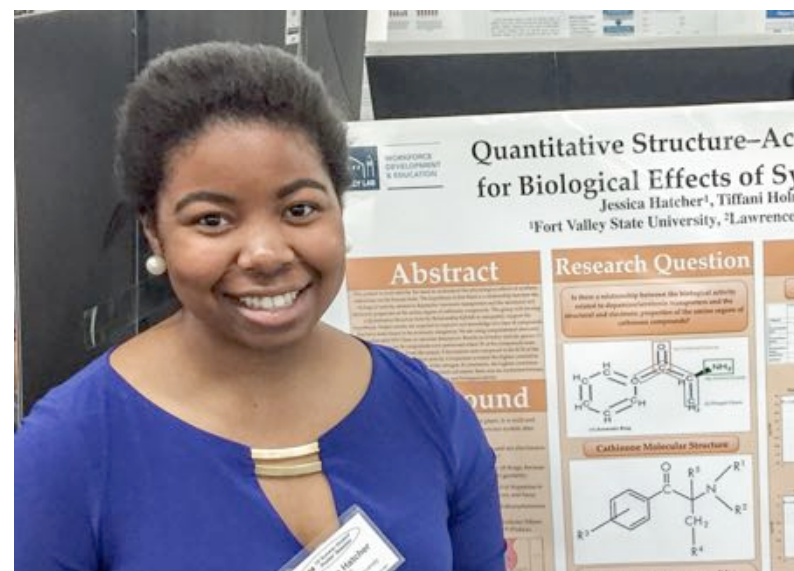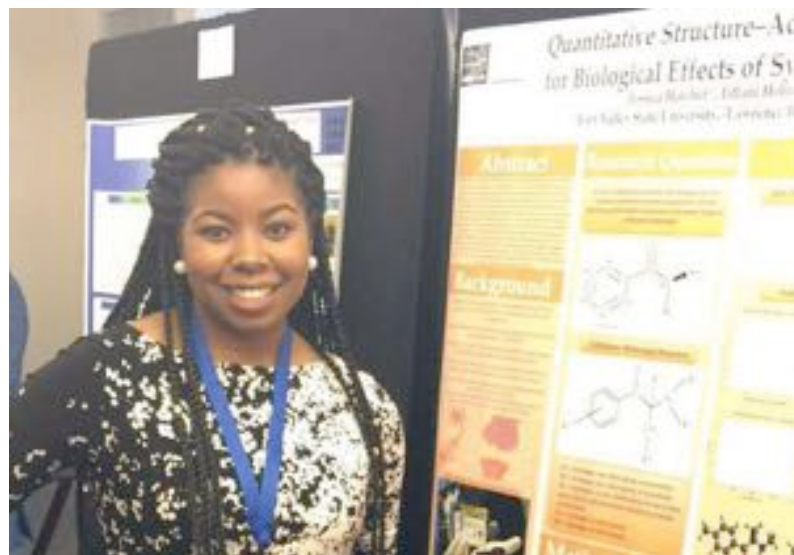
Fabrication

- Print your poster in small form and check it carefully

- Posters will be attached to the wall or on poster boards

- We can accommodate more portrait posters than landscape

- We can print 4' by 3' posters from a high-resolution pdf file

- You will receive email from Osni Marques and Teresa Montero on signing up for the poster session and instructions on how to get your poster printed

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Examples

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WHICH IS MORE IMPORTANT: NUMBER OF PATCHES OR CONNECTIVITY?

Darin Kalisak, PBS Student

Contact: dlkalisa@unity.ncsu.edu

INTRODUCTION AND OBJECTIVES

Metapopulation conservation efforts with limited resources would benefit from a clear understanding of the effects of different conservation strategies, so that the conservationists can decide how to best spend their resources. In particular, in metapopulations with randomly occurring patch extinction and recolonization, it is desirable to know what conservation strategy is more effective: is it better to spend effort to add new patches to the metapopulation, or is it better to spend that effort to facilitate migration between patches?

As an aid to real-life conservation efforts, this model might be useful in weighing various strategies. For example, if the conservation choices for an endangered species are either to buy land to connect existing habitats (increasing connectivity), or to simply work to preserve multiple habitats (increasing number of patches), the model may avoid a solution which is economically preferable but ecologically ineffective.

I developed a simple metapopulation model to investigate this issue. I ran the model using varying numbers of patches, where each patch is considered to be either extinct or occupied, and where every pair of patches is either connected or disconnected for purposes of migration. The whole metapopulation is

THE ISSUE

RESULTS

I tested the model by running simulations which varied over four parameters:

- number of patches (values 4, 5, 6, and 7)
- minimally connected to maximally connected (expressed as the ratio of migration pathways to number of patches, or c/p)
- time-step-extinction probabilities of .2, .4, .6, and .8
- time-step-migration probabilities of .2, .4, .6, and .8

For every combination of these parameters, I ran 100 simulations of 1000 time-steps each, and tracked the number of instances out of those 100 runs that the metapopulation did not go extinct. For each number of patches, I then summed the numbers of surviving metapopulations for each connection ratio to obtain a summary value for each patch/pathway configuration. The results are graphed below. The model showed that increasing the number of patches by only one patch had a far greater effect on metapopulation survival than did increasing the connectivity between patches. A horizontal line intersecting two result curves would, at each intersection, show the ratio of connectivity necessary to achieve the same survival rate for each of the two metapopulations. In every case the metapopulation with the greater number of

- **Too many large text blocks, Some issues about flow (solution stated before problem), Poor color contrast in some sections, Some unlabeled figures, A cut-and-paste from Excel, but**
- **A reasonable overall balance and format, clear titles**

ASSUMPTIONS AND LIMITATIONS

pathways for each patch fairly constant. No effort was made to investigate the effects of less symmetric configurations.

•Starting patch habitation was randomly determined, and so the results may not correspond well to specific species metapopulations with known starting conditions.

•All patches were assumed to be either fully occupied or extinct, and of equal value to the metapopulation.

•All migration pathways were equivalent, regardless of spatial distances or other factors involved.

•The model had a low resolution for differing probabilities of extinction and migration.

•The model amalgamated results from differing extinction and migration probabilities within a number of patches. It is possible that for specific parameter values, this amalgamation will hide results contrary to the overall trend reported here.
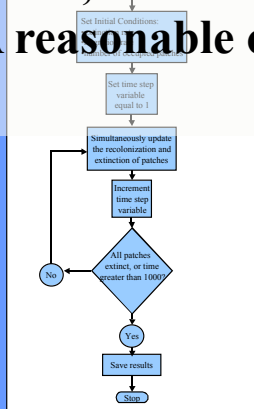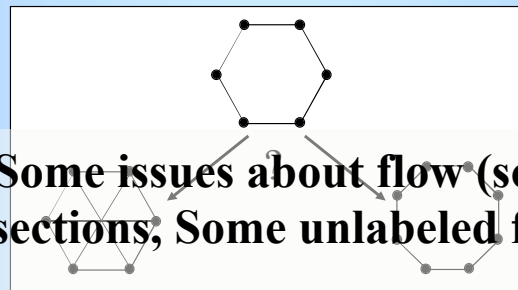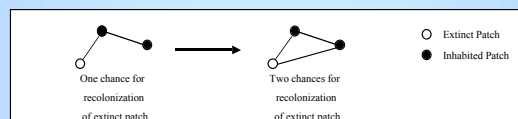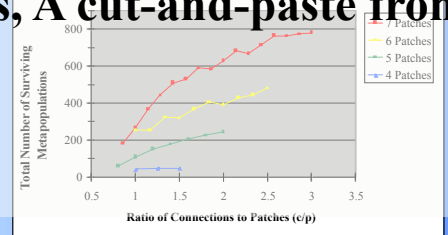
patches may typically go extinct and be recolonized. Is the long-term viability of the metapopulation helped more by adding new patches or by increasing the number of migration pathways between existing patches?

Adding patches increases the overall population of the organism, and makes a total extinction less likely by increasing the sheer number of patches which would have to go extinct.

Adding migration pathways increases the likelihood of recolonization of extinct pathways, by giving extinct patches more sources for immigration.

One chance for recolonization of extinct patch

Two chances for recolonization of extinct patch

○ Extinct Patch
● Inhabited Patch

CONCLUSIONS

The results of this model indicate that, when possible, adding patches to a metapopulation is far preferable to incremental increases in numbers of migration pathways. There are some cases in which substantial gains in numbers of pathways can improve the long term viability of the metapopulation compared to addition of a patch. When the costs of these additional pathways is relatively low, this may be a good strategy, however in most cases the greatest benefit to the metapopulation will come from adding more patches.

It is worth noting that in our results, the curve for each additional patch is steeper than the last. It may be that the low numbers of patches I tested are an important limit on the effects of connectivity. Simulations using larger numbers of patches may show that increased connectivity can have a greater effect on metapopulation survival than is seen here.

G.R. Hess, K. Tosney, and L. Liegel. 2010. Creating Effective Poster Presentations. http://www.ncsu.edu/project/posters

Computing Sciences

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- Too many large text blocks
- Text confused with background
- Randomly sized and colored boxes
- Annoying logos
- Cutesy and hard-to-read title

Algorithmic Probes for Evaluating Computer Architectures

FUTURE TECHNOLOGIES GROUP

Khaled Ibrahim kzibrahim@lbl.gov   Shoaib Kamil skamil@cs.berkeley.edu

Behavioral Modeling Using Apex Map

Apex-Map: Memory Access Probe
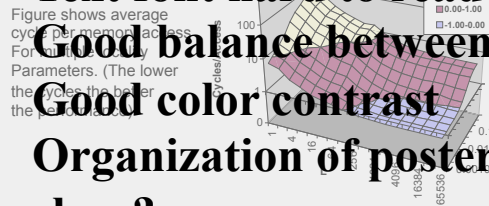Apex-Map generates memory references as stochastic variates based on sampling the following random process:

$$x_i = \frac{M}{L} r^{1/\alpha}$$

where α represents the temporal locality parameter of an application, M represents the memory footprint of this application, and L represents the spatial locality parameter of the application.

Assessing the Performance of an Architecture
Performance curve studies the system interaction with multiple locality parameters.

Figure shows average cycle per memory access. For different locality Parameters. (The lower the cycles the better the performance)

Using Apex Map as an Application Proxy
Other parameters are added to the model to capture complex application, such as computational intensity, register pressure, and concurrency level.

The figures below shows the that Apex-Map can follow the behavior of CUPS application closely.
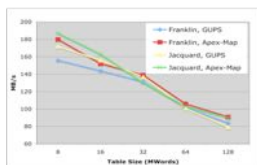
Apex-Map	Stream
Pattern	Random
Temp Locality	1
Spatial Locality	1
Reg. Pressure	1
Comp. Intensity	15
Concurrency	NUPDATE
Access Mode	NESTED

Application Characterization

Application Communication Profiles
Characterize communication by using IPM profiling layer: run the full application unmodified and obtain the communication patterns. This shows the variety of communication signatures of DOE apps.
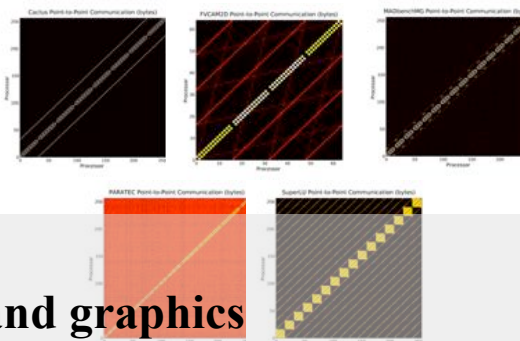
Extract Major Kernels
Based on communication and performance profiles, extract the major computational kernels into probes/reduced benchmarks, which can then be used in architectural evaluation.

Kernel Optimization

StencilProbe: Benchmark & Testbed for Stencil Optimizations
The StencilProbe enables optimization exploration of extracted stencil kernels, while avoiding the large overheads of running entire applications.

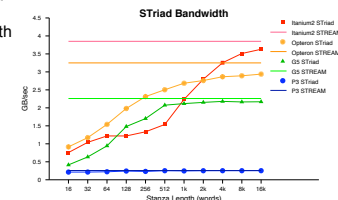Example stencils kernels and their memory access patterns.
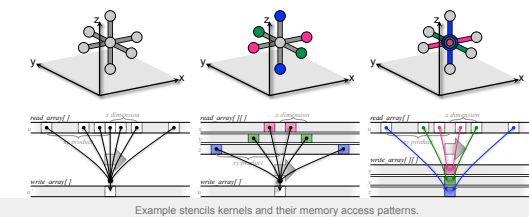
Using extracted kernels from Chombo and Cactus, two applications which heavily use stencils, data shows the StencilProbe accurately mimics application performance.

Discovering Prefetch Behavior using Stanza Triad
Based on the memory access pattern of cache-blocked stencils, the Stanza Triad is a simple version of the STREAM benchmark that uses *stanzas*: unit-stride triads are performed for a set number of locations before jumping in memory.

STriad results show that prefetching engines are sensitive to stanza length and memory bandwidth suffers if stanzas are (and thus stencil cache blocks) are too small.

- **Text font hard to read**
- **Good balance between text and graphics**
- **Good color contrast**
- **Organization of poster reflects organization of project, but is the reading order clear?**

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- **Striking design and good visual appeal (some people might think it too much like an advert)**
- **Good balance between text and graphics**
- **Good color contrast**
- **Issues on left, solutions on right**
- **Color coding ties panels together**