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 and 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
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

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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.
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!
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

- **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://sciencefair.math.iit.edu/display/layoutflow/

http://bonfx.com/bad-typography/
## Bad Poster Bingo by Zen Faulkes

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

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?


http://betterposters.blogspot.com/2012/03/colour-clash.html
Follow Poster Session Instructions

- Note format and size requirements
- Put up and take down your poster in a timely manner
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
Resources

• Colin Purrington, Swarthmore College
  – http://colinpurrington.com/tips/poster-design
  – 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

• Many YouTube videos…
CS Summer Student Program Poster Session

• August 2\textsuperscript{nd}, 10:00-12:00
• Bldg 59, Room 3101
• We expect >50 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.
Fabrication

• 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

• 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
Examples
WHICH IS MORE IMPORTANT: NUMBER OF PATCHES OR CONNECTIVITY?

Darin Kalisak, PBS Student
Contact: dlkalisak@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 conservationist can decide how to best spend their resources. In principle, metapopulations with density-migrating patch dynamics and recolonization, it is desirable to know what conservation strategy is most 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 decision for an endangered species are either to buy land or connect existing habitats (increasing connectivity), or to simply work to preserve multiple habitats (increasing number of patches), the model may avoid solutions which are economically preferable but ecologically unfeasible.

I developed a simple metapopulation model to investigate this issue. I ran the model varying the effects of different conservation strategies, so that the conservationists can decide how to best spend their resources.

The program

-Paste from Excel, but...-

• 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

THE ISSUE

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.

RESULTS

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

- number of patches (values 3, 4, 6, and 7)
- extinction rate (values .2, .4, .6, and .8)
- migration rate (values .2, .4, .6, and .8)
- migration pathways to number of patches, or c/p

For every combination of these parameters, I ran 100 simulations of 1000 time-steps each, and plotted the number of simulations 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 greater effect on metapopulation survival than did increasing the connectance between patches. A horizontal line representing too much money spent, or a different strategy, shows the value of patches in varying numbers.

CONCLUSIONS

The results of this model indicate that, when possible, adding patches to a metapopulation is 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 additional of a patch. When the costs of those 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 reassuring that in our results, the curve for each additional patch is steeper than the last. It may be that the few new patches I tested are on an important part of 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 shown here.
ABSTRACT:
One ignored benefit of space travel is the potential elimination of obesity, a chronic problem for a growing majority in many parts of the world. In theory, when an individual is in a condition of zero gravity, weight is eliminated. Indeed, in space one could conceivably follow ad libitum eating and never gain or lose weight, and the only side effect would be the need to upgrade one’s stretchy pants (exercise pants). But because many diet schemes start as very good theories, only to be found to be not nearly as exciting once one put them to the test, we have used the pigs to test the validity of the theory. When the pigs were taken into space, they lost weight, but when they were returned to Earth, they gained weight back. Therefore, we conclude that the pigs were able to lose weight in space, but not to gain weight back.

INTRODUCTION:
The current obesity epidemic started in the early 1960s with the invention and proliferation of elastane and related stretchy fibers, which released weavers from the rigid constraints of clothes and permitted monthly weight loss without the need to buy new outfits. Indeed, exercise today for hundreds of millions of people involves only the cost of wearing stretchy pants in public, presumably because the constructive force loss is less than the cost of buying new outfits. In addition, the pigs were found to be more willing to eat when in space, and the authors concluded that the pigs were able to lose weight in space, but not to gain weight back.

RESULTS:
Mean weight gain in pigs was 0.0000 ± 0.0000 kg. Some individuals weighed less than zero, some more, but these variations were due to reaction to the duct tape, which caused them to be blinded to the fact that they were being studied. The control cohort, gained about 2.4% (p = 0.0002). Males and females gained a similar amount of weight over the same period of time.

CONCLUSIONS:
Our view that weight and weight gain would be zero in space was confirmed. Although we have not replicated this experiment on larger animals or primates, we are confident that our result would be mirrored in other model organisms. We are currently in the process of obtaining necessary human trial permissions, and should have our preliminary experiment results within 60 years, pending expedited review by local and Federal IRBs.

ACKNOWLEDGEMENTS:
I am grateful to generous support from the National Research Foundation, Black Hole Diet Plans, and the High Fructose Sugar Association. Transport flights were funded by SPACE-EXES, the consortium of owners devoted to interstellar wealthy space-flight startups. I am also grateful for comments on early drafts by Mafana Athletic Club, Corpus Christi, USA. Finally, sincere thanks to The Gyu Foundation for generously donating animal care after the conclusion of the study.

LITERATURE CITED:

copyright colin parrington
http://colinparrington.com/tips/academic/posterdesign.html
Apex-Map: Memory Access Probe

Apex-Map generates memory references as stochastic variables based on sampling the following random process:

\[ s_i \sim \mathcal{E}(\frac{M}{1+L}) \]

where \( s_i \) 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

- 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?

Using Apex Map as an Application Proxy

Other parameters are added to the model to explore complex application, such as computational intensity, register pressure, and concurrency level.

The figures below show that Apex-Map can follow the behavior of CUPS application closely.

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.

StencilProbe: Benchmark & Testbed for Stencil Optimizations

The StencilProbe enables optimization exploration of extracted stencil kernels, while avoiding the large overheads of running entire applications.

StencilProbe: Benchmark & Testbed for Stencil Optimizations

Example stencil kernels and their memory access patterns.
• 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