August 3, 2021

Announcements

August 9 (Mon)	Presentation rough drafts due
August 10 (Tues)	Up-Goer Abstracts during Communications Class
August 17 (Tues)	Final Abstracts/Slides/Posters due (noon)
August 17 (Tues)	Practice during Communications Class
August 19-20 (Th/F)	Research Symposium • ~14 presentations each day) • 5 minute talks/Poster Presentations • You will be give share screen access

Review

- Scientific Writing
- Reference Managers
- Figures for Publication
- Scientific Posters
- Speaking – Scientific Audience

How to write an effective abstract

What is an abstract and why is it important?

- An abstract is a brief summary of a research article, thesis, review, or conference proceeding and is often used to help the reader quickly ascertain the paper's purpose. (Wikipedia: Abstract(summary))

- The first, and possibly only, part of your paper that anyone will read

- Part of the conference/symposium program.

It **is** a publication.

Parts of an abstract

- All the same components as the paper
  - Background
  - Methods
  - Results
  - Conclusions
- All in 150-350 words

  Your abstract for the research symposium should be 300 words or less
- Specific format depends on the journal

Characteristics of a good abstract

- Precise language
- Minimum sufficient background information
- Sufficient methods
- Specific findings
- Supported conclusions

Six sentences to start

(http://www.easterbrook.ca/steve/2010/01/how-to-write-a-scientific-abstract-in-six-easy-steps/)

1. What are we talking about?

   In widgetology, it's long been understood that you have to glomp the widgets before you can squiffle them.

2. What is the problem?

   But there is still no known general method to determine when they've been sufficiently glomped.

3. Why hasn't anyone else answered this problem?

   The literature describes several specialist techniques that measure how wizzled or how whomped the widgets have become during glomping, but all of these involve slowing down the glomping, and thus risking a fracturing of the widgets

4. What is your new idea?

   In this thesis, we introduce a new glomping technique, which we call googa-glomping, that allows direct measurement of whifflization, a superior metric for assessing squiffle-readiness.

5. What did you do?

   We describe a series of experiments on each of the five major types of widget, and show that in each case, googa-glomping runs faster than competing techniques, and produces glomped widgets that are perfect for squiffling.

6. Why should I care?

   We expect this new approach to dramatically reduce the cost of squiffled widgets without any loss of quality, and hence make mass production viable.

Abstract MadLibs!!

This paper presents a _____ method for _____
(synonym for *new*) (sciencey verb)
the _____. Using _____, the
(noun few people have heard of) (something you didn't invent)
_____ was measured to be _____ +/- _____
(property) (number) (number)
_____. Results show _____ agreement with
(units) (sexy adjective)
theoretical predictions and significant improvement over
previous efforts by _____, et al. The work presented
(Loser)
here has profound implications for future studies of
_____ and may one day help solve the problem of
(buzzword)
_____.
(supreme sociological concern)

Keywords: _____, _____, _____
(buzzword) (buzzword) (buzzword)

title: "Abstract Mad Libs" - originally published 1/14/2009

Examples

With your break out group, identify each of the components in each of the three *Science* abstract examples:

- Background
- Methods
- Results
- Conclusions
- Discuss the quality of the abstract

Disruption of the head direction cell network impairs the parahippocampal grid cell signal

Shawn S. Winter, Benjamin J. Clark, Jeffrey S. Taube

(1)Navigation depends on multiple neural systems that encode the moment-to-moment changes in an animal's direction and location in space. (2)These include head direction (HD) cells representing the orientation of the head and grid cells that fire at multiple locations, forming a repeating hexagonal grid pattern. (3)Computational models hypothesize that generation of the grid cell signal relies upon HD information that ascends to the hippocampal network via the anterior thalamic nuclei (ATN). (4)We inactivated or lesioned the ATN and subsequently recorded single units in the entorhinal cortex and parasubiculum. (5)ATN manipulation significantly disrupted grid and HD cell characteristics while sparing theta rhythmicity in these regions. (6)These results indicate that the HD signal via the ATN is necessary for the generation and function of grid cell activity.

Cycles of species replacement emerge from locally induced maternal effects on offspring behavior in a passerine bird

Renée A. Duckworth, Virginia Belloni, Samantha R. Anderson

(1)An important question in ecology is how mechanistic processes occurring among individuals drive large-scale patterns of community formation and change. (2)Here we show that in two species of bluebirds, cycles of replacement of one by the other emerge as an indirect consequence of maternal influence on offspring behavior in response to local resource availability. (3)Sampling across broad temporal and spatial scales, we found that western bluebirds, the more competitive species, bias the birth order of offspring by sex in a way that influences offspring aggression and dispersal, setting the stage for rapid increases in population density that ultimately result in the replacement of their sister species. (4)Our results provide insight into how predictable community dynamics can occur despite the contingency of local behavioral interactions.

Spatially structured photons that travel in free space slower than the speed of light

Daniel Giovannini, Jacquiline Romero, Václav Potoček, Gergely Ferenczi, Fiona Speirits, Stephen M. Barnett, Daniele Faccio, Miles J. Padgett

(1)That the speed of light in free space is constant is a cornerstone of modern physics. (2)However, light beams have finite transverse size, which leads to a modification of their wave vectors resulting in a change to their phase and group velocities. (3)We study the group velocity of single photons by measuring a change in their arrival time that results from changing the beam's transverse spatial structure. (4)Using time-correlated photon pairs, we show a reduction in the group velocity of photons in both a Bessel beam and photons in a focused Gaussian beam. (5)In both cases, the delay is several micrometers over a propagation distance of ~1 meter. (6)Our work highlights that, even in free space, the invariance of the speed of light only applies to plane waves.

Best practices for abstract writing

- Write the abstract last
- Everything in the abstract MUST be in the paper
- Write in concise, complete sentences
- Use past tense
- Jargon should be appropriate for audience
- Don’t include citations (generally)
- Use only common abbreviations and acronyms
- Do not refer to figures or tables in the text

References

- http://www.easterbrook.ca/steve/2010/01/how-to-write-a-scientific-abstract-in-six-easy-steps/

- How to write a good abstract for a scientific paper or conference presentation by Chittaranjan Andrade (Indian J Psychiatry. 2011 Apr-Jun; 53(2): 172–175)

- http://abacus.bates.edu/~ganderso/biology/resources/writing/HTWsections.html

The challenge: Can You Explain a Hard Idea Using Only the Ten Hundred Most Used Words? It's Not Easy!

http://splasho.com/upgoer5/