August 6, 2019

Announcements

August 8, Thursday, noon, Rm 382: Optional Perfect Pitch Contest

August 9, Friday: Draft Poster Due

August 9, Friday, 11:45 am, Rm 382: Optional Student Lunch Panel

August 14, Wednesday, noon: Final Poster Due

August 16, Friday, 3 pm: Abstract Due

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August 9, Friday, noon to 11 pm: South Lake Union Block Party
http://www.slublockparty.com/

Review

- Scientific Writing; Reference Managers
- Figures for Publication
- Scientific Posters
- Speaking – Scientific Audience (Chet Moritz)

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

Parts of an abstract

- All the same components as the paper
  - Background
  - Methods
  - Results
  - Conclusions
- All in 150-350 words
- 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 __________ (synonym for *new*) method for __________ (sciencey verb) the __________________ (noun few people have heard of). Using _________________ (something you didn't invent), the ___________ (property) was measured to be ______ (number) +/- _______ (number) ________ (units). Results show _____________ (sexy adjective) agreement with theoretical predictions and significant improvement over previous efforts by ___________ (Loser), et al. The work presented here has profound implications for future studies of ______________ (buzzword) and may one day help solve the problem of _________________________ (supreme sociological concern).

Keywords: ____________ (buzzword), ____________ (buzzword), ____________ (buzzword)

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

How to write an abstract for a specific journal

- Scope
- Audience
- Format

Examples

With your neighbor(s), 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.

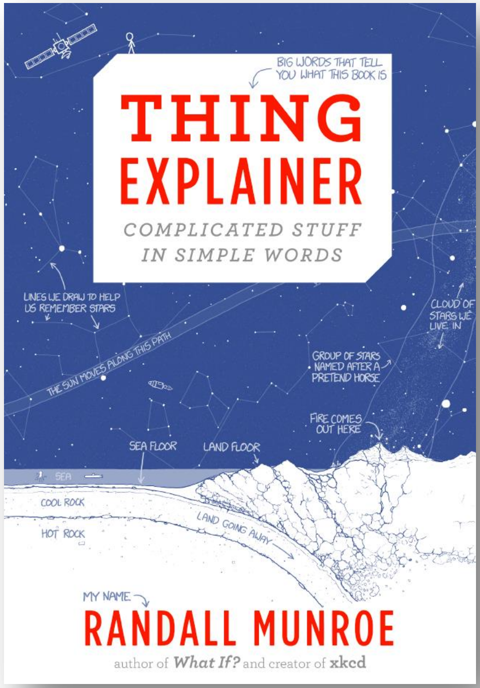
Best practices for abstract writing

- 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

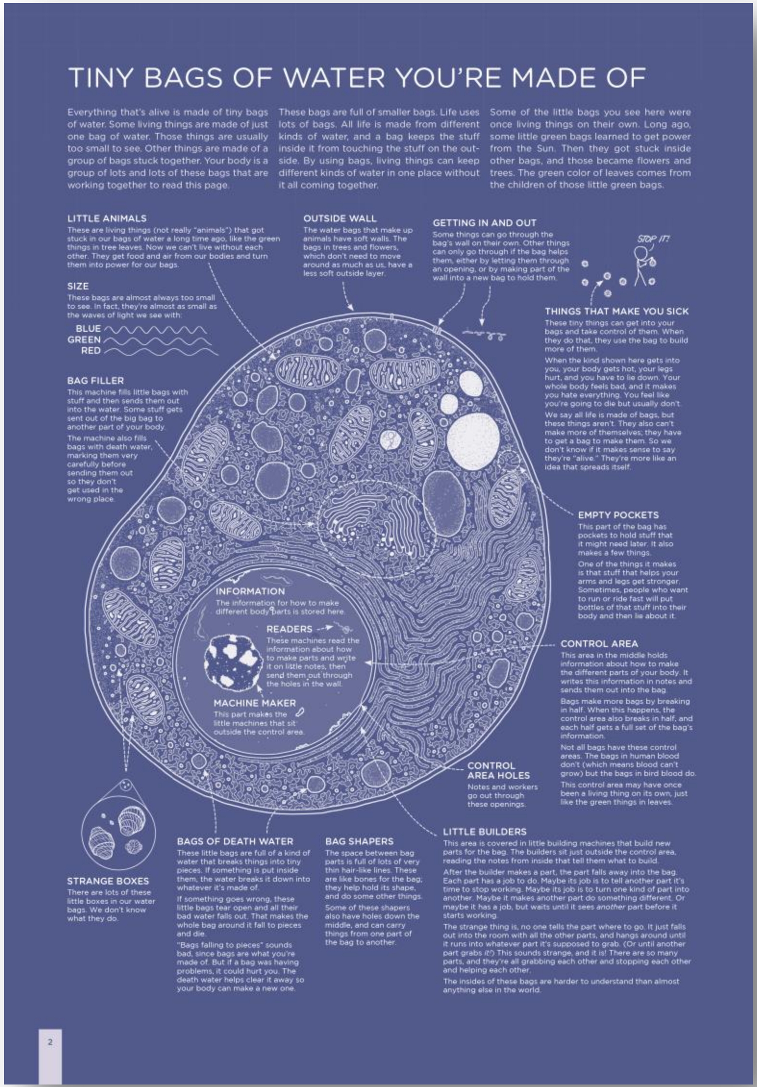
References

- 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

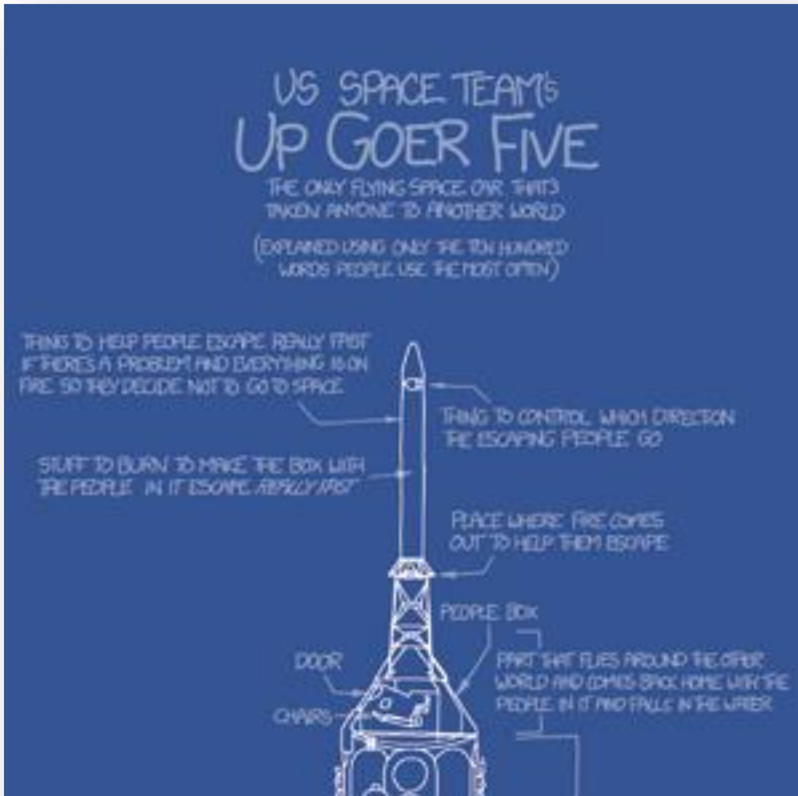
The Thing Explainer

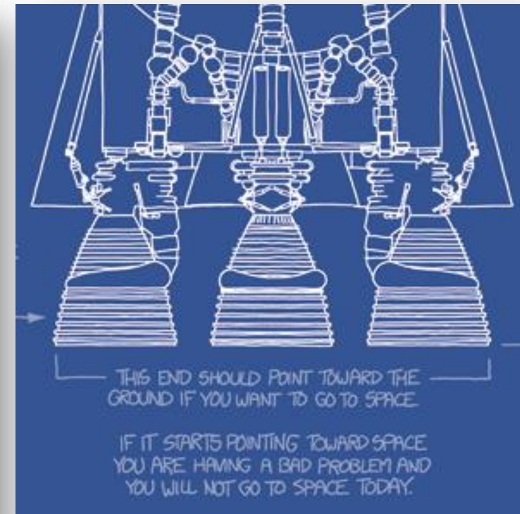


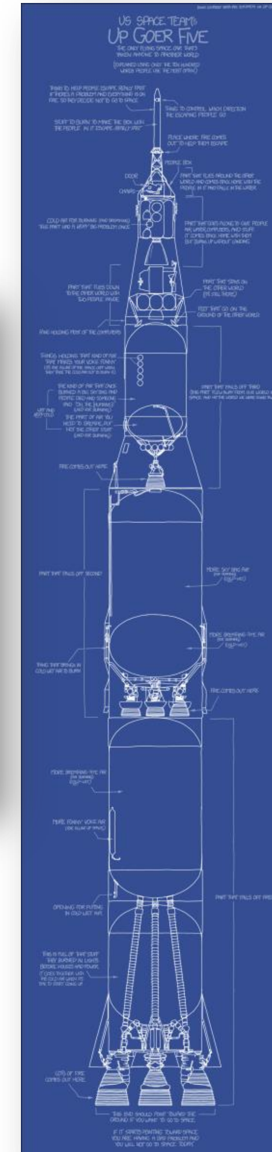
https://xkcd.com/thing-explainer/



Space Travel Simplified







http://xkcd.com/1133/

A Scientist/Engineer Walks into the Room…

Modeling Conduction Velocity After Activity Dependent Electrical Stimulation Alters Myelin Post Spinal Cord Injury

Following an incomplete spinal cord injury (SCI), axons undergo demyelination, and oligodendrocytes begin remyelinating the remaining, intact axons. However, these new sheaths of myelin result in a slower conduction velocity of action potentials partially because they are thinner. Previous research has shown that neuronal activity can increase myelination and improve gait. In this blind, pilot project, we explore whether *in vivo* targeted activity driven spinal stimulation (TADSS) has similar effects. We have seen substantial recovery of forelimb motor performance after cervical SCI with TADSS; this project examines whether faster conduction velocities due to alterations in white matter could serve as a mechanism explaining this phenomenon. We hypothesize that activity dependent stimulation will globally mitigate thinning of descending motor axons found at the epicenter of the injury and caudal to it. Eventually, we will measure other parameters that affect conduction velocity such as the internode length of myelin and more fully test the conduction speed by looking for evoked responses *in vivo*.

Advanced/Specific Vocabulary? Requisite Knowledge?

Modeling Conduction Velocity After Activity Dependent Electrical Stimulation Alters Myelin Post Spinal Cord Injury (Alexis Drake, 2015, abbreviated abstract)

Following an **incomplete spinal cord injury (SCI), axons** undergo **demyelination**, and **oligodendrocytes** begin **remyelinating** the remaining, intact **axons**. However, these new **sheaths** of **myelin** result in a slower **conduction velocity** of **action potentials** partially because they are thinner. Previous research has shown that **neuronal** activity can increase **myelination** and improve **gait**. In this blind, pilot project, we explore whether ***in vivo*** **targeted activity driven spinal stimulation (TADSS)** has similar effects. We have seen substantial recovery of **forelimb motor performance** after **cervical SCI with TADSS**; this project examines whether faster **conduction velocities** due to alterations in **white matter** could serve as a mechanism explaining this phenomenon. We hypothesize that **activity dependent stimulation** will globally **mitigate** thinning of **descending motor axons** found at the **epicenter** of the injury and **caudal** to it. Eventually, we will measure other parameters that affect **conduction velocity** such as the **internode** length of **myelin** and more fully test the **conduction** speed by looking for **evoked responses *in vivo***.

A Journalist, Kid, Your Grandma Walks into the Room…

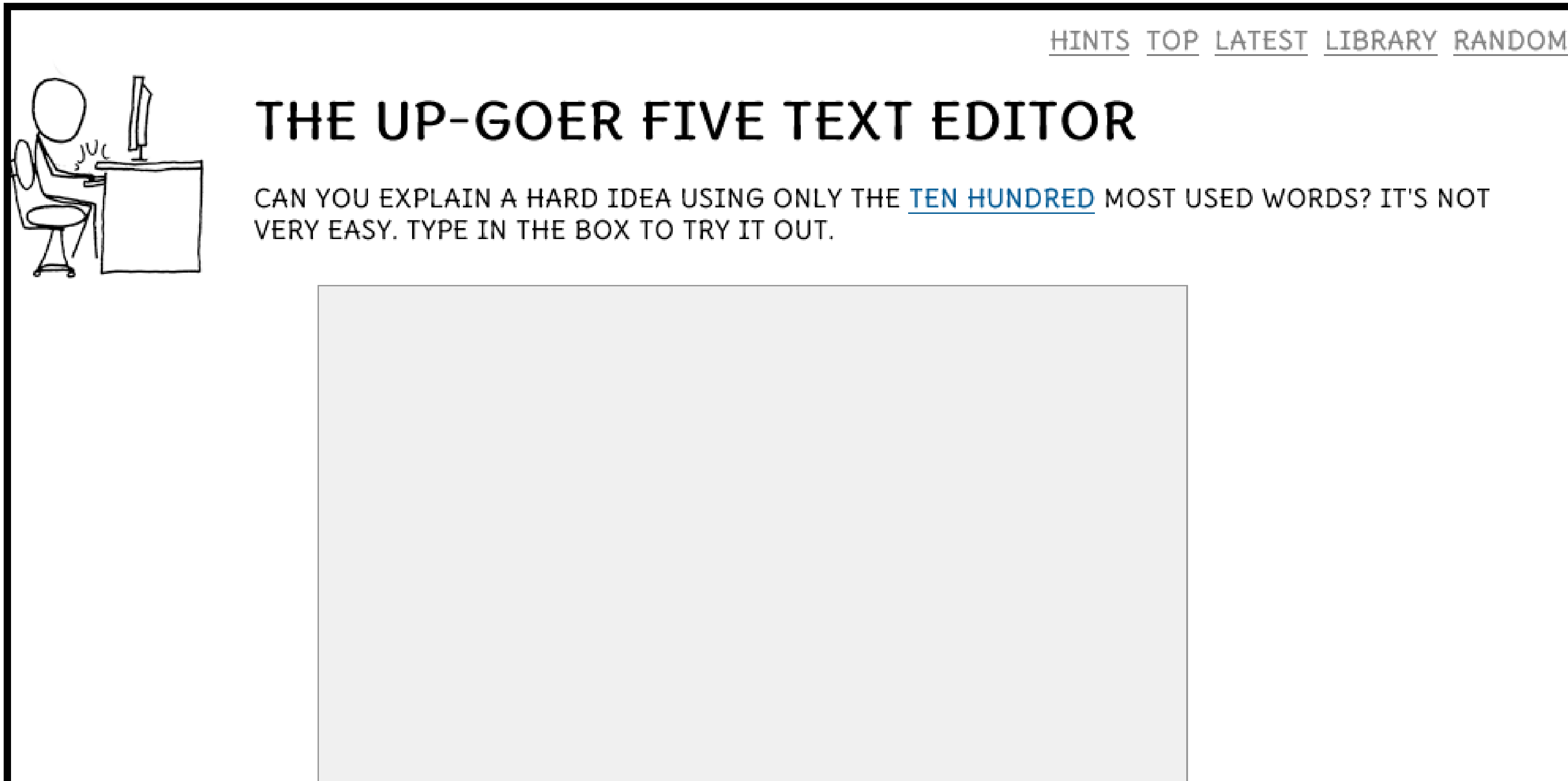
The brain controls our body. It talks through cells in our backs that go all the way to our other body parts and make them move. The brain tells them what to do like cars driving down a fast road.

When someone hurts their back, it's like a car hits another car and causes a back up, blocking the road. They then lose some control over moving their body. Cells in their back try fixing themselves. However, the new cells don't work as well. They are slower. It is like the cars have to go out of their way and use smaller roads, and it takes longer to get places.

In the long run, we are trying to see if shocking the cells in the back when a hurt animal is trying to reach for a piece of food will help them. We hope that the shock will give the cells a thicker covering because a thicker covering is like a faster road.

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

http://splasho.com/upgoer5/



Email your UpGoer Abstracts

Optional: Email to chudler@uw.edu by August 12, 3 pm.

You will present your UpGoer abstract on August 13 during Communications Class.

Your final ("real", non-UpGoer) abstract is due on Friday, August 16, 3 pm. This will be used in the Research Symposium Program.

Maximum abstract length = 250 words