Preparing your manuscript – what are the editors and reviewers looking for?

Bruce C. Wheeler,
Editor in Chief IEEE Transactions on Biomedical Engineering
and
University of Florida

Editorial Process (TBME)
-- Put yourself in my shoes --

- How manuscripts are assigned
  - Associate Editors, Reviewers
- How Reviews are Processed
- Final Decision
  - Revisions – Major/Minor
  - Is it just rewriting?
  - Do new experiments / simulations need to be done?
  - How long will it take?
- Abstracts
- Preferred and non-preferred reviewers

Put Yourself in the Reviewer's Shoes

Reviewers are busy, knowledgeable people

Clarity = Rapid Ability to Understand Your Paper

- Basic Idea
- Format of Presentation
- Claims and Support for those Claims
- Importance
- Novelty

What's your Contribution?

- It's not what you want to say …

  … it's what the readers want to know

- Highly focused statement of the essence of your new intellectual contribution
- Context … abbreviated literature review that rapidly allows the reviewer to know what is new and what has been done and why the new idea is important

Classic Format

Until you're more practiced, stick to classic formats (as Dr. Neuman has presented)

Experimental

- Introduction
- Materials and Methods
- Results
- Discussion & Conclusion

What did you do and did you really do it?

Methods and Results

- Your contribution ordinarily has several specific claims, each of which needs evidence to back it up
- Reviewers will look very narrowly at these claims and the methods/results that back up them up
- Validation – did it work in simulation? In a controlled experiment? In the clinic?

Is it Important?

Introduction / Discussion

- Underscore potential impact of the work

Is it Novel?

Introduction / Discussion

- Underscore the novel nature of your work

Common Problems

Abstracts

- Supposed to be a Summary of the article
- Too often
  - Extensive background material
  - Omission of quantitative results
    - "we report here a study of the relationship of blood pressure and selected features of the PPG waveform"
  - Citations
- Editor may only read the abstract before assigning the paper for review
- Scientific community – most read only your title; most of the rest read only the abstract

I don't care if your instrument worked …

System Design

Common problem – manuscript consists of a description of the hardware and software for a complex operation, with a brief demonstration that it functioned as designed

"I know it worked" -- so what?

Evaluation of design? Design criteria?

How does the reviewer tell whether or not the design was a good one?

It's Not Your Thesis

"Thesis papers" very often have

-- too many references

-- cover too many topics

-- are narratives of the student's intellectual discovery process

You must discipline yourself to extract what is supportive of your basic contribution and omit the rest

MethodsResultsInterpretation

- Continuous blending of experimental method, experimental design, measurements, interpretation
  - It may be the way you experienced the process, but …
  - It's not how the reviewer / reader expects to see the components
- Example complaint common in more theoretical / modeling papers
  - ¾ of the way through the paper there's a paragraph that includes number of subjects, IRB approval, digital sampling rate, and peaks of power spectrum …

Incomplete Data

- You've graduated … you have a new job … the lab apparatus is dismantled …
- The review comes back and says …
  - Good idea, but
    - "… need 10 more subjects for statistical significance"
    - "… figure 6 is good but a control is needed at 100kHz"

Heretical Suggestion

- While you are in middle of your experimentation or modeling …

  Write your paper and fake your data!!

  -- pretend you have all the data you need – when you need a graph, just sketch in the way you think the results will go

- Purpose

  Writing will help you understand what experiments need to be done – before you graduate, leave and can't do them any more

Importance of Your Writing

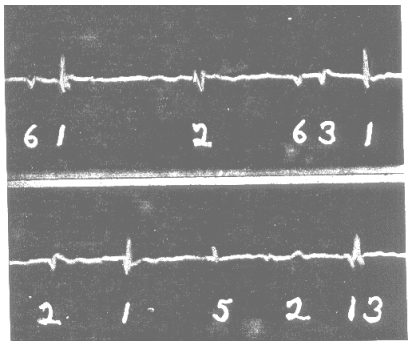
Single best way to evaluate the capabilities of an engineer is her/his writing

- Standard tests (e.g. GRE's) are wildly inaccurate
- Presentations are important but material goes by too quickly
- One-on-one interviews are good but take solid interviewing skills

Writing requires

- discipline, organization, thoroughness
- understanding of the background and consequences
- Planning

Proposals, papers, job applications, marketing, internal reporting



Early Spike Sorting: 100% correct, six units

Prosser, C.L., Action potentials in the nervous system of the crayfish. I. Spontaneous impulses. J. Cell. Comp. Physiol. 4: 185-209, 1934.

Famous Graduate Student Saying

"Six months in the laboratory can save you an afternoon in the library."