Advice for Preparing Long-Form Abstracts, FAQ, and Abstract Submission Instructions

1. Advice for Preparing Long-Form Abstracts

Recommendations:

Please write your long-form abstract for a general engineering/science audience (like an article in *Science* or *Nature*). Reviewers (and judges) could be from any engineering field. They may be professors or professional engineers working in industry.

There are no requirements regarding what to include in the abstract text. However, highly scored abstracts typically contain the following subheadings:

Introduction

Start with a sentence or two describing the importance of your work – essentially a ***hook statement*** – that captures your audiences' attention. Your introduction should compel a wide SHPE audience to see your project as important to society and/or business. Next explain how the big problem (e.g., fuel shortages, early device failure, manufacturing efficiency, cancer, etc.) is influenced by what you are studying (alternative fuels, fatigue analysis, systems engineering, cancer cell biology, etc.). Then state what is not yet understood about the specific aspect of the problem you are studying – essentially a well-informed ***needs statement***.

Lastly (and most importantly), state the research question(s) or hypothesis you are addressing in the study. If you have more than one, enumerate them. Make sure your results actually answer the question as stated. Almost all good research questions can be stated in one of the following forms:

– The research objective is to determine if A and B are (statistically) different.
– The research objective is to determine the relationship between X and Y
– The research objective is to measure parameter P with accuracy A.

Methods

Describe the methods you used to test the research question – essentially your specific ***approach*** to solving the specific problem at hand. As this is a short, long-form abstract you need not include every detail, but you do need to tell the reader a) what kinds of specimens or conditions you studied (perhaps how many), and b) what you measured (stating the measurement technique). If you measured a lot of things only include here the measurements that are necessary to answer your research question/s.

Results

In this section describe the data and any statistical analyses. It is important to be as quantitative as possible, so please report numbers. Often you will present the results numerically as Mean ±

Standard Deviation (or standard error). State the results of your tests (is A different from B? Is X correlated with Y? What is the p-value and what is the accuracy A?). Your statistical tests often involve reporting p values.

Discussion

Start this section by stating the answers to each of your research questions. Then talk about strengths and/or novelty of the study – essentially the knowledgeable or tangible ***benefits*** as an outcome of your study. Your outcomes should also be contextualized within the engineering and scientific literature – essentially contextualizing other ***competing*** studies that are seeking to solve the same specific problem at hand. It's nice to end with a peppy statement regarding how your findings will be immediately useful to others (instead of saying that your findings probably will solve world fuel shortage instead you probably want to say that the work is one important step toward making a better alternative fuel) – essentially a ***closing statement***.

Suggestions for Design-based Abstracts

Some students submit more "design-based" abstracts (i.e., you made something to meet a task). If your work is more design based you may be tempted to have a research question like "The research objective is to design a widget that functions." Such research questions are weak because you will never really know if it's not possible to design such a widget. Instead, consider the following: "The research objective is to determine the effect of widget design characteristic X on performance characteristic Y." By stating your research question this way it is very clear that you have tested the widget (you had to measure characteristic Y) so that you actually have quantitative results to present. In the Discussion section you could then talk about how the observed performance characteristic Y is within the range desired for the applications you have in mind.

2. Frequently Asked Questions

May I submit an abstract based on the research I did in the summer? What about the research I did during the current or past school years?

Yes and Yes. Students may submit abstracts based on work done during research over the summer, during the school year or even during a co-op or internship. There are only two limitations: 1) you may not submit work that has previously been presented at a SHPE national meeting; and 2) you must have permission from your research mentor to submit the work in public (your presentation could influence intellectual property so please ask your mentor). Please tell your mentor that your abstract **will not be published** (see below).

Are abstracts or submitted papers published?

The conference proceedings will include only the titles, authors and institutions for all Finalists. The text of the submitted abstracts and the papers submitted will remain confidential and will not be released or published (the authors maintain copyright on the abstracts and technical papers). The presentations themselves are public.

Am I allowed to have more than one author of an abstract?

Yes. The student submitting the abstract for the Engineering Science Symposia will be the first author of the abstract and will be responsible for presenting the work at the conference. Most likely you will have co-authors (your research advisor, other students who contributed to the work). During abstract submission you can enter the names of the other authors in the box entitled "Other Authors." Please remember that the order in which authors are listed is very important in publications. Please consult your research advisor on the appropriate individuals to include as authors and the order in which to list them.

May I submit more than one abstract?

Yes. There is no limitation to the number of abstracts that a student may submit. However, to allow as many students as possible to participate, at most only one of the abstracts you submit will be invited to be presented at the meeting (the competition organizers will select the highest-scoring abstract from those submitted by a student).

When will I know if I am selected to compete?

The competition committee will review abstracts, select those for competition by the date specified on the Engineering Science Symposia website, and will send an email invitation to compete. If you accept the invitation you must respond and provide a high-resolution (300 dpi) digital photograph to the organizers within 48 hours of the email receipt. The digital photograph must show your face and be professional in nature as it could potentially be published in SHPE social media.

When do I submit my video?

Upon approval of your abstracts, you will receive an email invitation with more information about how to submit your video submissions.

3. Instructions for Abstract Submission

Abstract Format

Select "Yes" to signify that you read and understood the following PDF instructions on submitting an abstract.

Last Name First Name Middle Initial	Your name will be listed in the program as <Last Name>, <First Name> <Middle-Initial>
Email Address	This is the email address we will use to contact you regarding acceptance and video submission instructions.
Gender	Not used for acceptance criteria; used for diversity statistics purposes

Abstract Title (100 characters including spaces)

Please enter in the Abstract Title as you would like it to appear. Titles exceeding 100 characters (including spaces) may be truncated.

Other Authors

If you collaborated with the Barack H. Obama, George W. Bush and William J. Clinton you would enter:

Obama, Barack H.; Bush, George W.; Clinton, William J.

The list of collaborators would then read in the program as follows:
<Last Name>, <First Name> <Middle Initial>.; Obama, Barack H.; Bush George W.; Clinton, William J.

Submission of a 2-Page Maximum PDF Abstract

Please upload your 2-page maximum .pdf abstract (maximum file size 500 kb). Use 12-point font Times New Roman, 1-inch margins, single or double-space. Cite any works using the IEEE convention style. The list of references must be within the 2-page limit.

Additional Information

Please check all appropriate boxes. The information will not be used in selected abstracts for the competition, but will provide demographic information useful to the educational goals of the committee and supporting organizations.