

Preparing a Conference or Journal Publication on Your Research

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Jaclyn Johnson

jenesbit@mtu.edu

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Outline

- Conference and Journal Publications
 - Process
 - Abstract
 - Format / Organization of the Paper
 - Review of Each Section
 - General Comments / Suggestions / Guidelines

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Writing a Paper....

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- Writing a journal paper / conference paper can be a great accomplishment and culmination of hard work in research.
 - Even with a great research discovery, however, lack of proper communication is detrimental
- Writing a journal paper / conference paper takes time
 - Plan ahead, leave time for writing, editing, rewriting, proofreading, etc.
- Know the goal / objective / purpose of your research paper
 - Must be something new / novel - not a reproduction of prior work
 - Literature review is important
 - No plagiarism
- Choosing a journal / conference to publish in
 - Consider which journals / conferences your work would be well-received at based on conventionally presented work; look at goals / objectives of journal
 - Consider your sources of your literature review for suggestions

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Generic Process

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Conference Publication

- Abstract Submission
 - Acceptance
- Draft Submission
 - Draft reviewed by ~3 reviewers, comments returned to you
- Final Submission for Publication
 - Include / respond to comments by reviewers; sometimes a response document is requirement
- Copyright document required

Journal Publication

- Draft Submission
 - Draft reviewed by ~3 reviewers, comments returned to you
- Final Submission for Publication
 - Include / respond to comments by reviewers
 - Include a response document to answer all reviewers comments
- Copyright document

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Abstract

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- Abstract must be submitted for consideration of acceptance to conference
 - Short summary / overview of Paper
 - Problem / Goal of paper
 - Method Used
 - Results / Key Conclusions
 - Concise – typically limited to XX words
 - Quantitative
 - Ex: Kinetics effects are small in comparison to changes in oxygen concentration associated with EGR, which show an increase in ignition delay.
 - Improvement: Kinetics effects are small in comparison to changes in oxygen concentration (**from 21 to 15%**) associated with EGR, which show a **170%** increase in ignition delay.

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Abstract, Continued

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- Should answer questions:
 - What problem was addressed?
 - What result was obtained?
 - How was the study conducted?
 - How was the data evaluated?

Jeter and Donnell 2011

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Format (Contents) of Paper

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- Introduction / Objectives / Motivation
- Apparatus and Procedures / Test Matrix / Test Setup
- Results (Data)
- Analysis & Discussion
- Future Work
- Conclusions
- References
- Acknowledgements

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Section: Introduction / Objectives / Motivation

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- Introduction
 - What is being studied?
- Motivation
 - Why is this study important?
- Literature review
 - What has been done in the past, and their results
 - Brief summary, include references and details, be quantitative
 - Include in-text references / citations
- Goals / Objectives
 - Bulleted lists sometimes help
 - What are the goals of the paper?
 - How will these goals be reached (Objectives?)

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Section: Introduction / Objectives / Motivation

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- Top Down Approach
 - Start with the Big picture and taper down to your paper purpose (a few sentences). Example:
 - Diesel engines are commonly used in internal combustion engines because of their relatively high efficiency, however, current limitations are with emissions and increasingly stringent regulatory standards. Diesel combustion and emissions is largely controlled by fuel spray and charge-gas mixing processes and therefore improving spray and mixing processes can assist in emission reductions. This requires knowledge of fundamental diesel spray parameters, including liquid length, which is the maximum extent the liquid phase fuel penetrates through the combustion chamber. This liquid length is seen to experience fluctuations about a quasi steady value which could have implications in fuel-spray mixing and emissions, as investigated currently. Etc....

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Section: Apparatus and Procedures / Test Matrix / Test Setup

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- Test Setup
 - Schematic / Picture with annotations -- "Picture is worth 1000 words"
 - List components / instrumentation used
 - Include part / model numbers and manufacturer information where appropriate.
- Test Matrix
 - Define testing conditions
 - Parameters swept / held constant

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Section: Apparatus and Procedures / Test Matrix / Test Setup

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- Diagnostics Used
 - Pressure transducers
 - Data Acquisition
 - Cameras / Imaging Diagnostics
- Testing Procedures
 - Methods
 - Repeating tests
- Data / Image Processing Methods
 - Variable Definitions
 - Processing methods

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Section: Results (Data)

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- Partition into smaller sub-sections
 - Should address all goals and objectives of the paper
 - Differentiate with subheadings -> different font styles / sizes / titles
- Discuss, *quantitatively*, your results
 - Explain trends and implications of your results
 - How does it compare to prior research
 - Address any surprising results and if follow-up work is merited.
- Support results with figures and tables where appropriate

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Section: Results (Data) – Figures

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- Include *descriptive caption* for the figure (below the figure); number figures
 - Figure caption explaining the conditions / constraints in data (figure / plot and caption should stand alone)
- Discuss the figure in the surrounding text, always introducing the figure in the text first
- Formatting
 - Usually specific requirements from conference or journal
 - High quality graphics - ~ 300 dpi is typically standard

<http://blogs.mathworks.com/pick/2010/05/28/creating-and-exporting-publication-quality-graphics/>

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Section: Results (Data) – Figures

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- Choose figure type best representing data
 - Data a function of a continuous variable – Line or Scatter Plot
 - Discrete data – Bar Chart
- For a series of figures use the same scale, keep on the same page of a paper (Matlab subplot)
- Font size / style should match that in other parts of the paper
- A figure or plot should make a key conclusion or conclusions about your results

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Plot Check List

- Use the x-axis for the independent variable (the variable changed by the experimenter)
- Use the y-axis for the dependent variable (the variable being measured)
- Plot data with symbols, functions and model results with lines
- Labels on each axis including units
- Appropriate scaling of axes (μm) rather than ($\times 10^{-6}$)
- Clearly labeled data with legend or annotation of data
- Axes limits which result in data filling most of the plot but do not exaggerate the data.
- Axes scales with a normal interval e.g., (... 0, 5, 10, 15, 20, ...)
- Use distinctive lines and symbols for plots with data series (Is it distinctive in B&W?)

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Bar Graph Check List

- Numerical annotations on the bar-length axis
- Labels on each axis including units
- Appropriate scaling of axes (μm) rather than ($\times 10^{-6}$)
- Clearly labeled data with legend or annotation of data
- Axes limits which result in data filling most of the chart but do not exaggerate the data. Length scales which cause the longest bar to extend nearly the length of the plot space.
- Axes scales with a normal interval e.g., (... 0, 5, 10, 15, 20, ...)
- Avoid the use of 3-D bars, they make comparisons more difficult
- If the bars have no natural progression (year, age, etc.), arrange bars in order of length to form a Pareto chart.

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Section: Results (Data) –Tables

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- Include *descriptive caption* for the table (above the table); caption should be numbered
- Cite in text before appearing in document
- Formatting
 - Usually specific requirements from conference or journal
 - Readable font – match the rest of your paper
 - Label and define rows and columns
 - Include units
 - Significant figures
 - Align decimals

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Section: Analysis & Discussion

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- Can sometimes be directly included in your results section
- If separate section, summarize your results, discussing all of the observed trends, how it compares to prior research, what are the causes and implications of the trends.

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Section: Future Work

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- Discussion follow-up / additional work as an add-on to the current work.
 - Additional experimental testing over different conditions
 - Additional processing / data analysis
 - Modeling with experimental results
 - Repeat tests to verify observed trends or to see if some data anomalies are repeatable

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Section: Conclusions / Summary

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- No new material should be introduced in this section
- Quantitative summary
 - Reiterate goals and objectives of the work.
 - Discuss key conclusions and implications - meeting goals and objectives
 - Quantitative – Ignition delay decreased XX% with YY% increase in oxygen concentration; not ignition delay decreased with oxygen concentration increase
 - Discuss observed trends and implications of observed trends

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Section: References

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- Use standard format – usually dictated by journal or conference
- Include all cited work in this reference list, with references included in text typically [1] format
 - Can use Endnote which ensures correct formatting automatically
 - <http://libguides.lib.mtu.edu/endnote>
 - Other details / references on formatting (some examples; not inclusive):
 - <http://owl.english.purdue.edu/owl/section/2/>

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Section: References

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- Use reputable references
 - No Wikipedia, etc.
 - Review Journal publications
 - Review Textbooks
- References for finding resources – Library
 - Librarians
 - MEEM Library Guide:
<http://libguides.lib.mtu.edu/content.php?pid=138653&sid=1186255>
 - SAE Digital Library – Online access
 - <http://services.lib.mtu.edu:4204/advanced/>
 - ILLIAD – Accessing reference material not available in the library or that the university does not subscribe to
 - <https://illiad.lib.mtu.edu/>
- Google Scholar – electronic searches for journal papers

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Section: Acknowledgements

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- Short acknowledgement to different sponsors.

- Research Project Sponsors
 - MTU
 - External Funded; Grant Numbers Where Appropriate
 - DOE / NSF
 - Industry
 - Etc.
- Laboratory Development / Instrumentation Support
- Collaborators that are not co-authors
- Graduate Assistant Support / Fellowships
 - MTU
 - External

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Section: Acknowledgements

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- Example Acknowledgements Section in Journal Publication:

This material is based on work supported by the National Science Foundation under grant number 0619585. The work was supported by funding provided from Chrysler through their graduate fellowship program. Additional support was provided from the Advanced Power Systems Research Center and Sustainable Futures Institute of Michigan Technological University, as well as the NSF IGERT program under grant number 0333401. Acknowledgement is also given to Sandia National Laboratory for their collaboration and support in development of the Michigan Technological University combustion vessel.

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Additional Sections – Varies by Journal / Paper Content

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- Nomenclature
 - Define variables / abbreviations used
- Appendices / Supplementary Material
 - For larger spreadsheets / tables
 - Essential derivations
 - Processing methods or further detailed analysis

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Equations

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- MS Word – Equation Editor
 - Verify formatting in PDF and when printing – sometimes there are compatibility issues with different versions of MS Word
 - Reference in text, number, define variables
 - Use numbering nomenclature as required by journal / conference

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General Comments

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- Organization / flow is important
 - Ease of readability
 - **Proofread, check for grammar**
 - Nancy Barr – 8th Floor ME Dept
 - http://www.me.mtu.edu/people/staff/n_barr.html
- Specific journal / conference likely has specific formatting requirements that you must adhere to
 - Sometimes templates are available
- MS Word
 - Cross referencing is useful for figure and table numbering to be automatically updated for the captions and in the text, even as order is changed.
 - Also useful in updating reference numbering and in-text citations

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General Comments

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- Be quantitative and concise
 - Watch for redundancy
- Grammar is important
 - Don't say 'like' -> use such as
 - Do not use slang; use Proper English
 - Do not use contractions – i.e.
 - Incorrect: A change in injection pressure doesn't influence liquid length
 - Correct: A change in injection pressure does not influence liquid length.
 - Full sentences
 - No run-on sentences

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Summary / Conclusions

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- Preparing a quality publication correctly takes time
 - Write, just to get started -- you can edit / remove / rearrange later
 - Easiest to continue to write throughout the research as opposed to waiting until the end
 - Good advice as you work towards your MS / PhD as well
 - **Start early**; leave time for internal reviews and those with industry sponsors as required
 - Make sure your paper is reviewed both technically for content and also for grammar / readability
- Follow conference / journal formatting requirements.
 - Develop paper including the generic organizational format presented here
- Use figures and tables to enhance / support your discussion in the text
- Review established literature for formatting / contents to assist in developing your paper
- Remember publications are a reflection on your research, and the department and university – make sure your publication is of high quality, experimentally and technically accurate, and correctly cites and credits others work

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References

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- Jeter, S., Donnell, J., Writing Style and Standards in Undergraduate Reports, 2nd Edition, College Publishing, 2011.

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