How to Write a Quality Technical Paper and Where to Publish within IEEE – Part 1

George Plosker
IEEE Client Services Manager
September 2015

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- Four Core areas of activity
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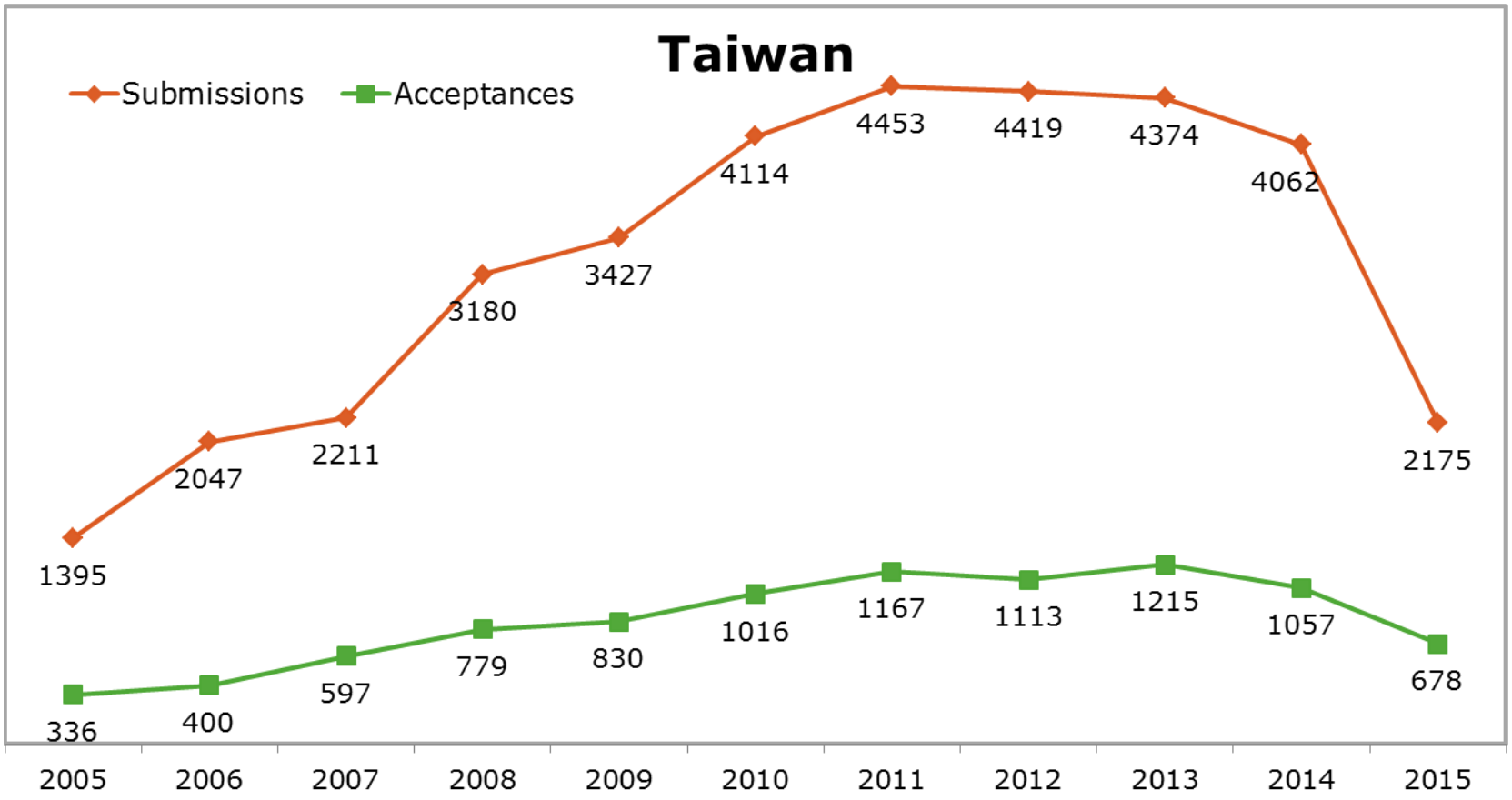

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- **3 of the top 5** journals in Artificial Intelligence
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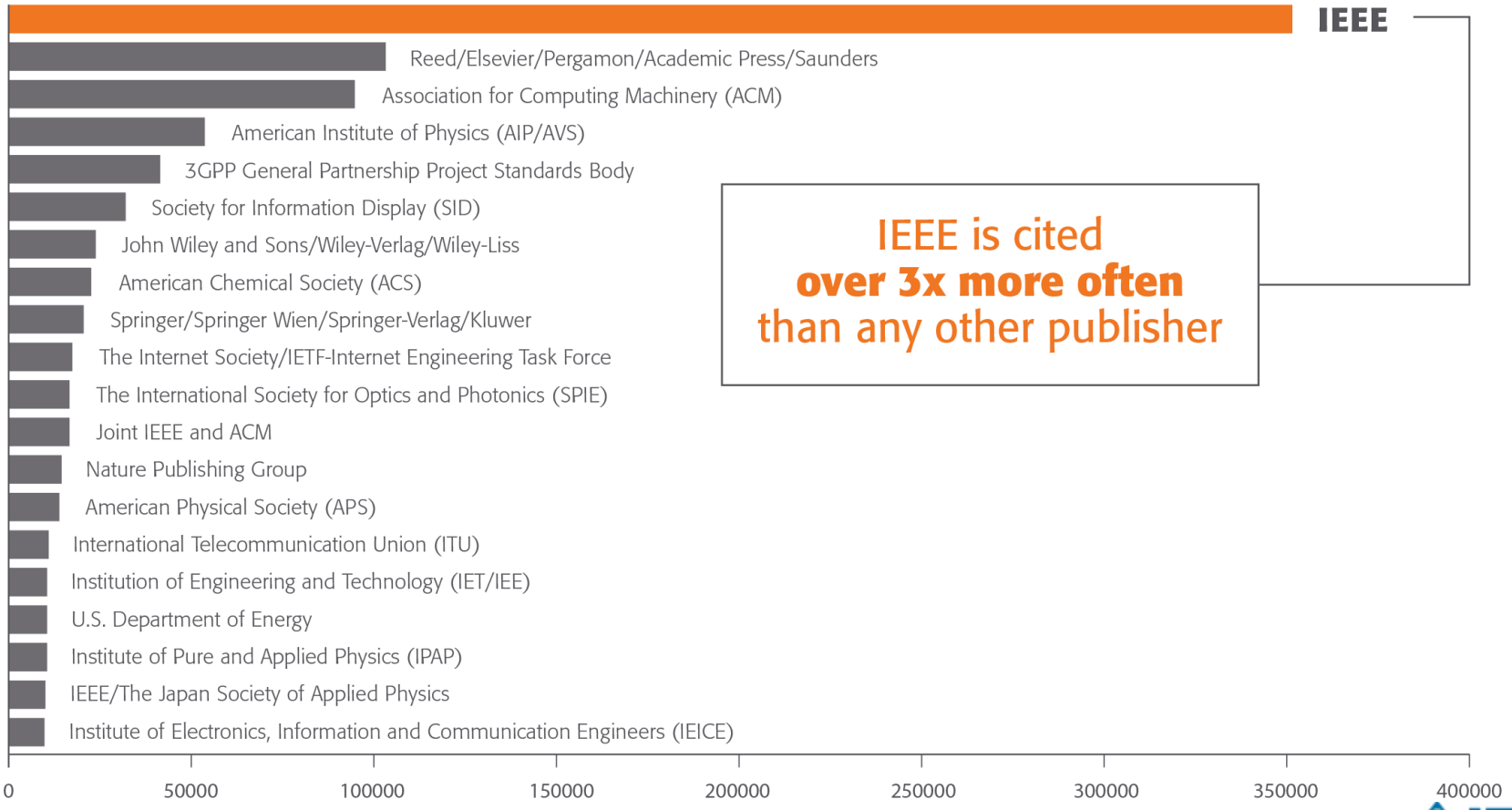

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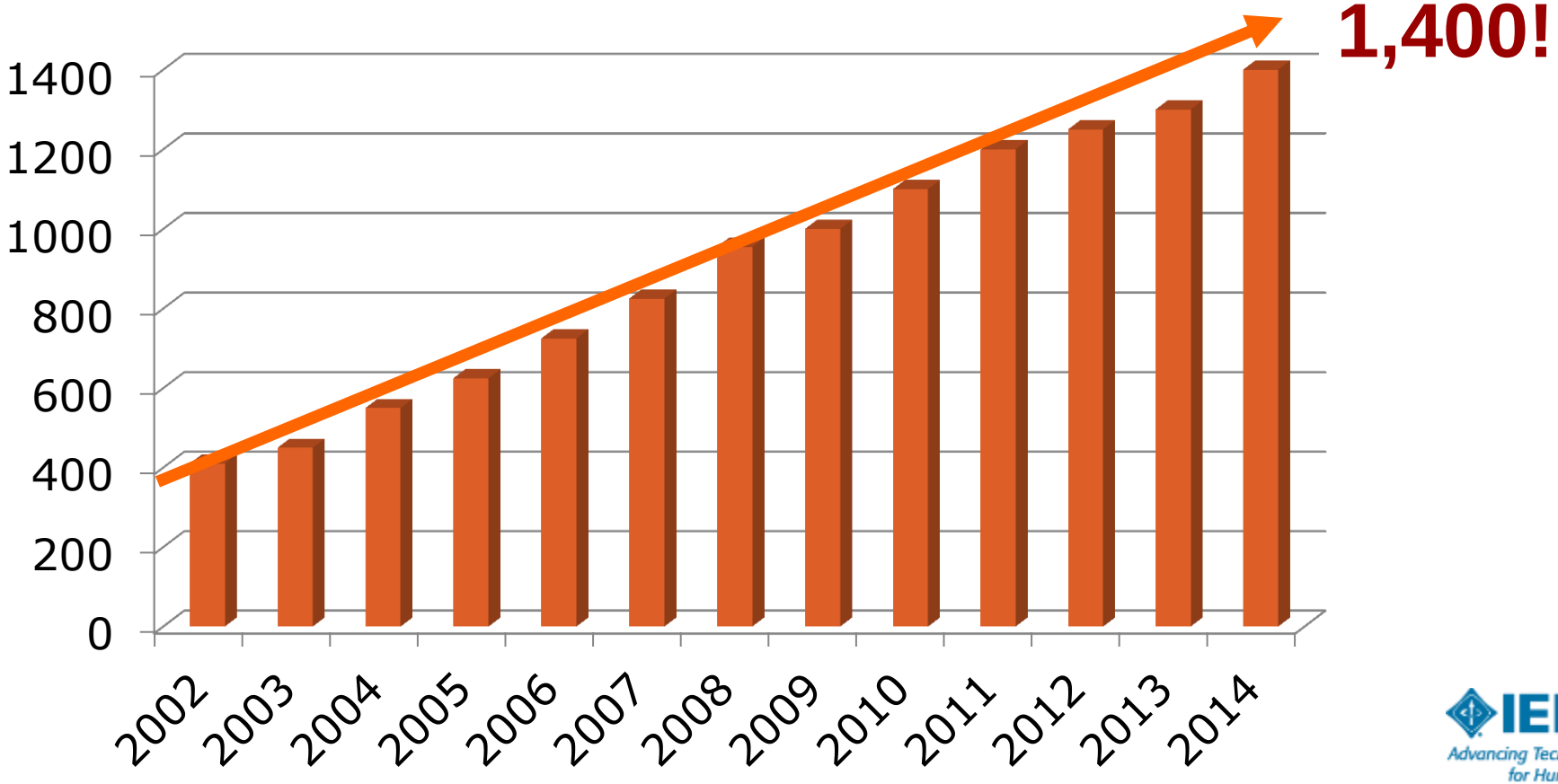

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(Forbes Global 2000 Rankings, June 2014)

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(US News and World Report 2013, (Study based on 2012) Times Higher Education Top Technology Universities)

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- Patent offices and scientific councils
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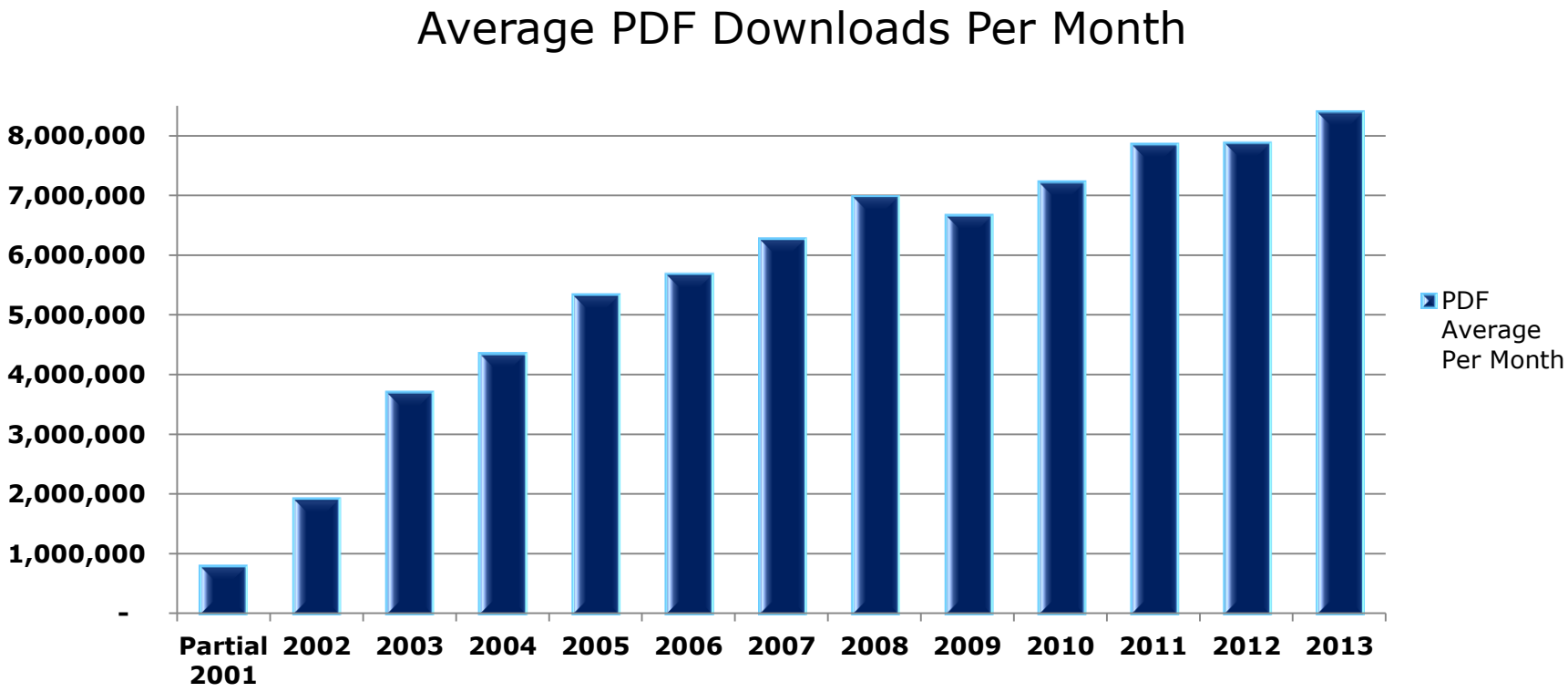

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Today's Author Workshop

Topics Covered

1. Publishing choices
2. Choose an Audience
3. Paper Structure
4. Ethics
5. Where to Publish
6. Open Access
7. Impact Factor
8. Next Steps

Choices

Publish

IEEE journal or IEEE conference?

- A **journal article** is a fully developed presentation of your work and its final findings
  - Original research results presented
  - Clear conclusions are made and supported by the data
- A **conference article** can be written while research is ongoing
  - Can present preliminary results or highlight recent work
  - Gain informal feedback to use in your research
- Conference articles are typically shorter than journal articles, with less detail and fewer references

Publish

IEEE journal or IEEE conference?

	IEEE Journals	IEEE Conferences
PRO	• IEEE journals are cited 3 times more often in patent applications than other leading publisher's journals	• IEEE Conference proceedings are recognized worldwide as the most vital collection of consolidated published articles in EE, computer science, related fields
CON	• A high percentage of articles submitted to any professional publication are rejected	• Per IEEE Policy, if you do not present your article at a conference, it may be suppressed in IEEE *Xplore* and not indexed in other databases

Publish

Finding the right IEEE publication or IEEE conference

IEEE has **170 unique publications** covering a wide range of technical areas

- Review the journal listings
  - Who reads it
  - What they publish
  - What kinds of articles they want

IEEE publishes >**1,300** leading-edge **conference proceedings** every year

- Review the conference calendar
  - Find a good match for your research subject matter
  - Ensure you are available to present

Audience

Audience

Basic Questions

1. Are you writing this paper for the sake of writing a paper?

2. Or do you want to make a difference in your technical community?

Audience

Scientific research publishing

- Who writes scientific papers?
  - Whoever solves a new and important problem in their field
  - Engineers, scientists, educators and researchers from:
    - Corporations
    - Academia
    - Government
  - Students typically write and present conference papers before submitting journal articles

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Audience

What IEEE editors and reviewers are looking for

- Content that is appropriate, in scope and level, for the journal
- Clearly written original material that addresses a new and important problem
- Valid methods and rationale
- Conclusions that make sense
- Illustrations, tables and graphs that support the text
- References that are current and relevant to the subject

Audience

Why IEEE editors and reviewers reject papers

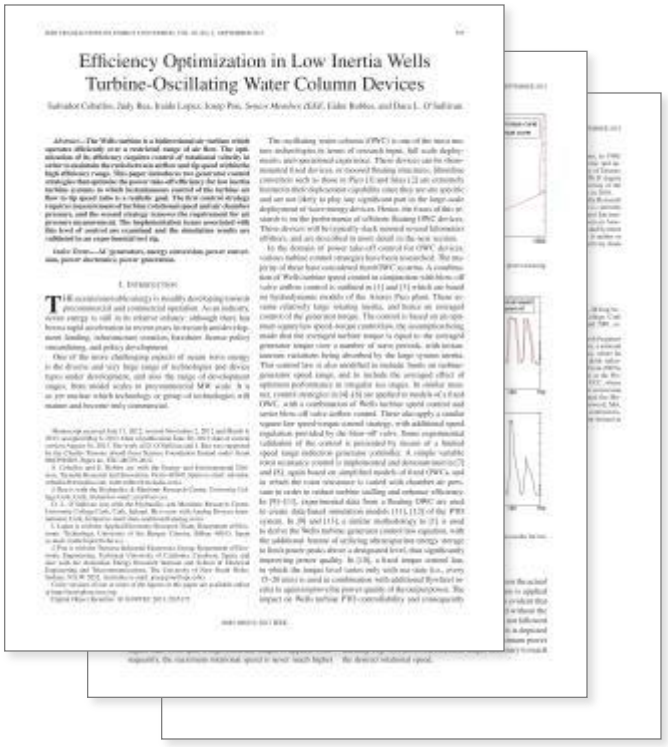
- The content is not a good fit for the publication
- There are serious scientific flaws:
  - Inconclusive results or incorrect interpretation
  - Fraudulent research
- It is poorly written
- It does not address a big enough problem or advance the scientific field
- The work was previously published
- The quality is not good enough for the journal
- Reviewers have misunderstood the article

Structure

Paper Structure

Elements of a manuscript

- Title
- Abstract
- Keywords
- Introduction
- Methodology
- Results/Discussions/Findings
- Conclusion
- References



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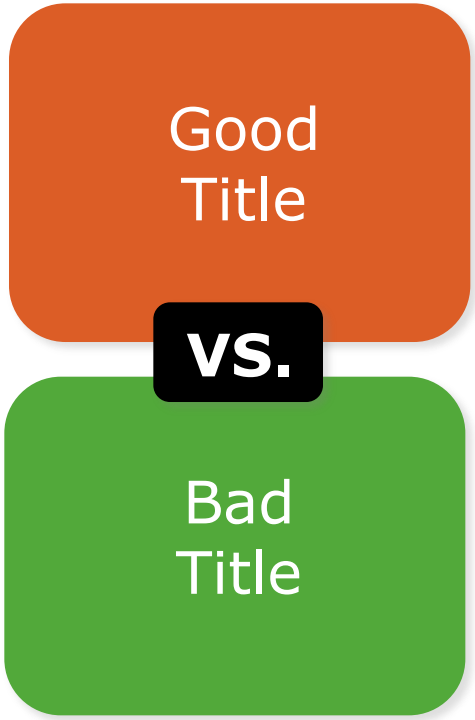
Paper Structure

Title

An effective title should…

- Answer the reader's question: *"Is this article relevant to me?"*
- Grab the reader's attention
- Describe the content of a paper using the fewest possible words
  - Is crisp, concise
  - Uses keywords
  - Avoids jargon



Paper Structure

Good vs. Bad Title

A Human Expert-based Approach to Electrical Peak Demand Management

vs

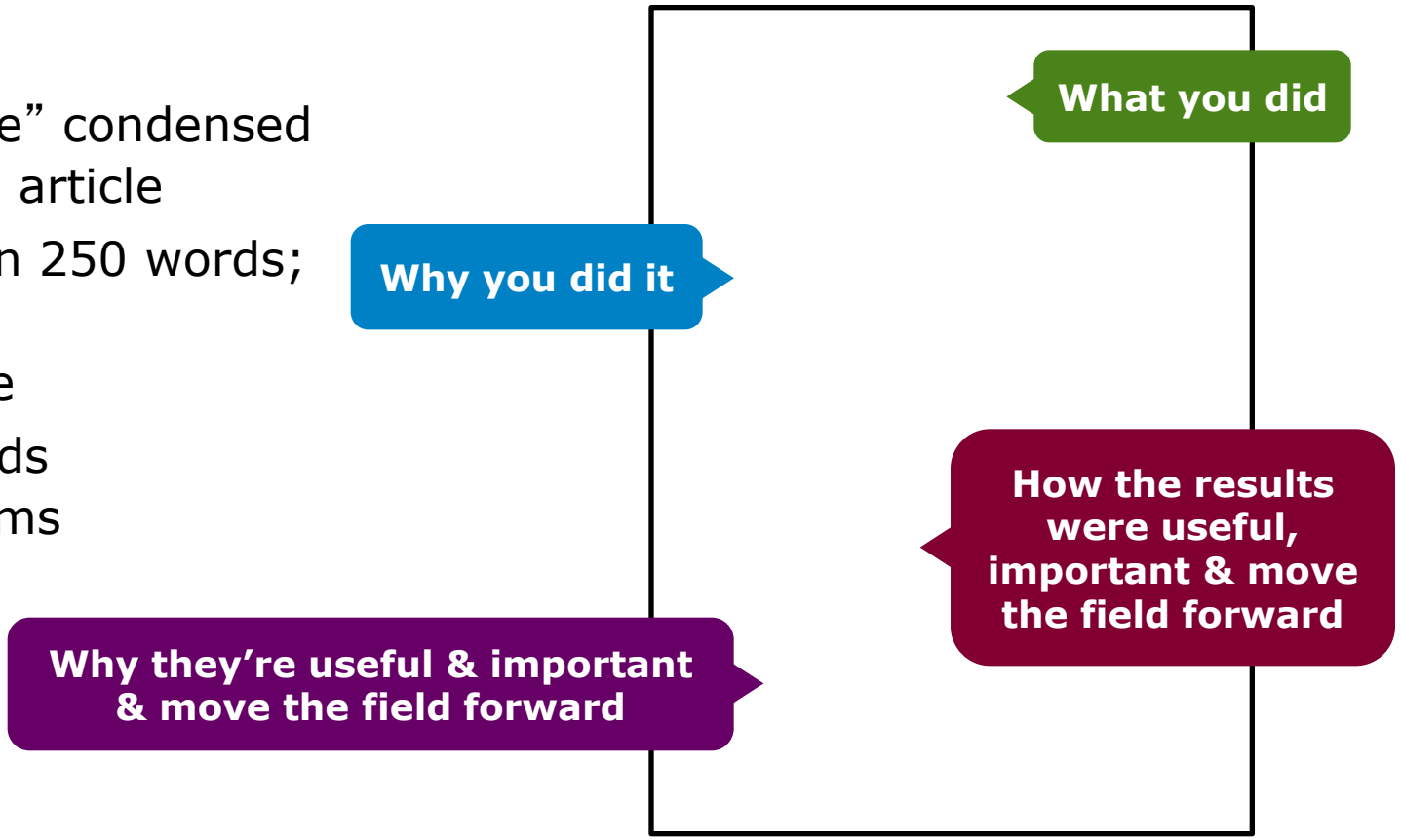
A better approach of managing environmental and energy sustainability via a study of different methods of electric load forecasting

Paper Structure

Abstract

A “stand alone” condensed version of the article

- No more than 250 words; written in the past tense
- Uses keywords and index terms



Paper Structure

Good vs. Bad Abstract

The objective of this paper was to propose a human expert-based approach to electrical peak demand management. The proposed approach helped to allocate demand curtailments (MW) among distribution substations (DS) or feeders in an electric utility service area based on requirements of the central load dispatch center. Demand curtailment allocation was quantified taking into account demand response (DR) potential and load curtailment priority of each DS, which can be determined using DS loading level, capacity of each DS, customer types (residential/commercial) and load categories (deployable, interruptible or critical). Analytic Hierarchy Process (AHP) was used to model a complex decision-making process according to both expert inputs and objective parameters. Simulation case studies were conducted to demonstrate how the proposed approach can be implemented to perform DR using real-world data from an electric utility. Simulation results demonstrated that the proposed approach is capable of achieving realistic demand curtailment allocations among different DSs to meet the peak load reduction requirements at the utility level.

Vs

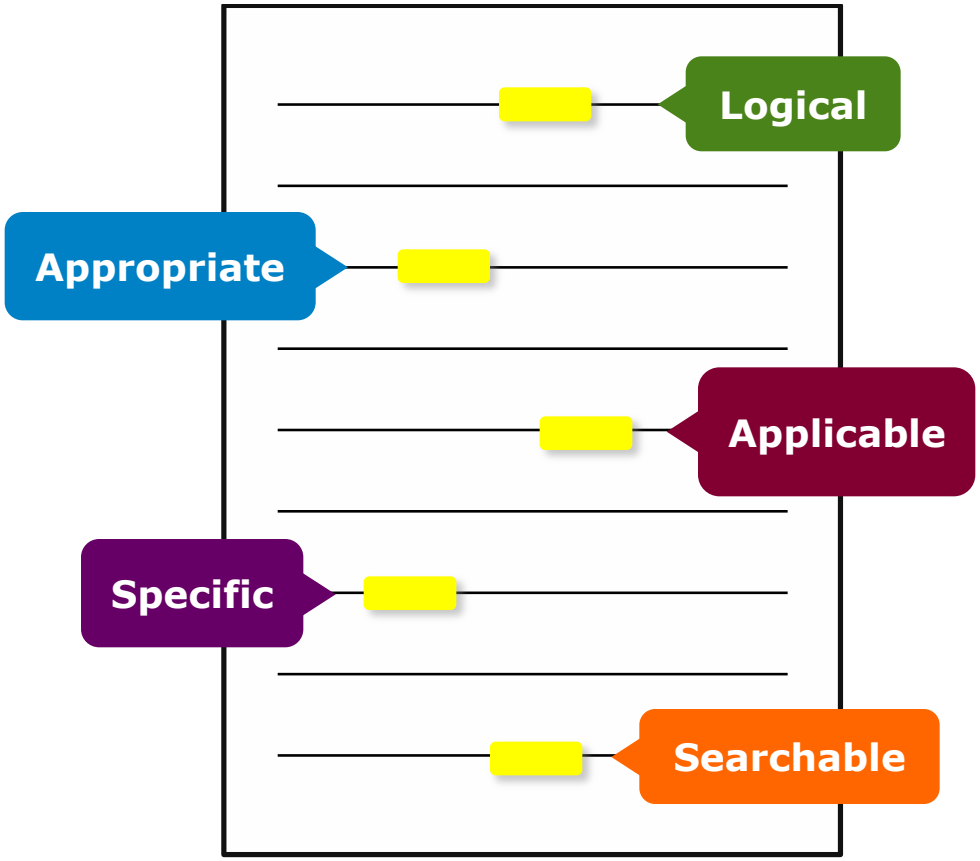
This paper presents and assesses a framework for an engineering capstone design program. **We explain** how student preparation, project selection, and instructor mentorship are the three key elements that must be addressed before the capstone experience is ready for the students. **Next, we describe** a way to administer and execute the capstone design experience including design workshops and lead engineers. **We describe the importance** in assessing the capstone design experience and report recent assessment results of our framework. **We comment** specifically on what students thought were the most important aspects of their experience in engineering capstone design and provide quantitative insight into what parts of the framework are most important.

First person, present tense
No actual results, only describes the organization of the paper

Paper Structure

Keywords

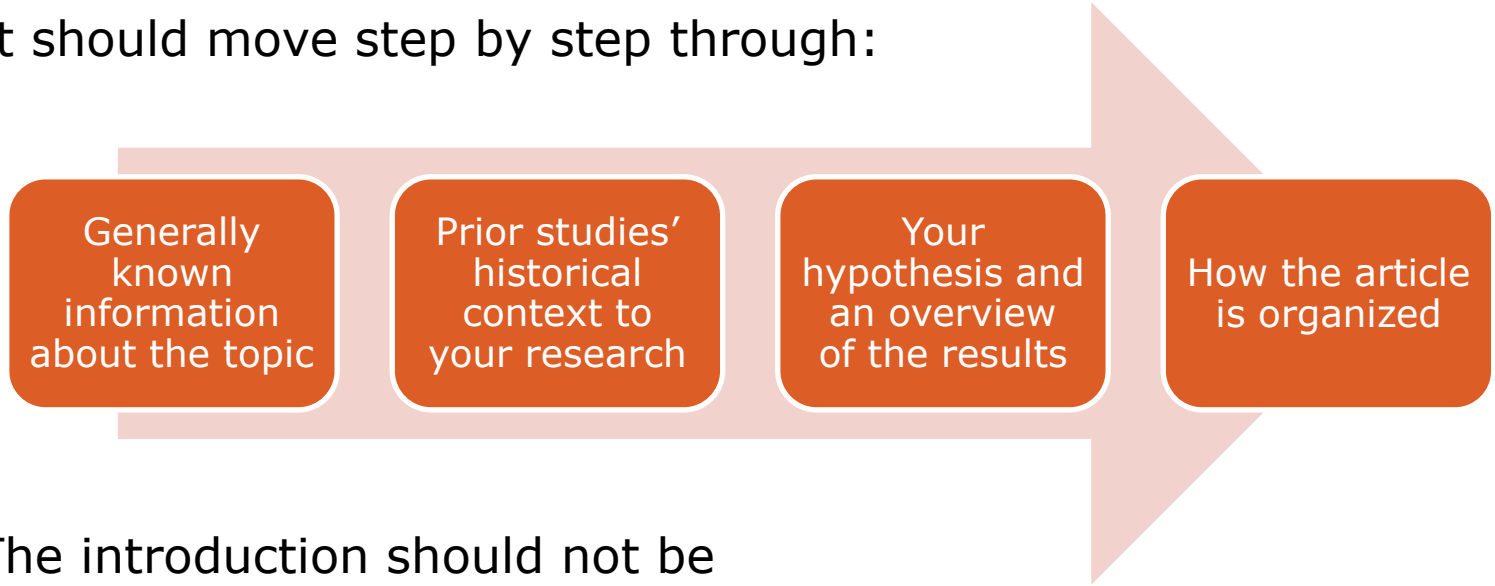
Use in the Title and Abstract for enhanced Search Engine Optimization



Paper Structure

Introduction

- A description of the problem you researched
- It should move step by step through:



- The introduction should not be
  - Too broad or vague
  - More then 2 pages
  - Written in the present tense

Paper Structure

Methodology

- Problem formulation and the processes used to solve the problem, prove or disprove the hypothesis
- Use illustrations to clarify ideas, support conclusions:

Tables
Present representative data or when exact values are important to show

Graphs
Show relationships between data points or trends in data

Figures
Quickly show ideas/conclusions that would require detailed explanations

Paper Structure

Results/discussion

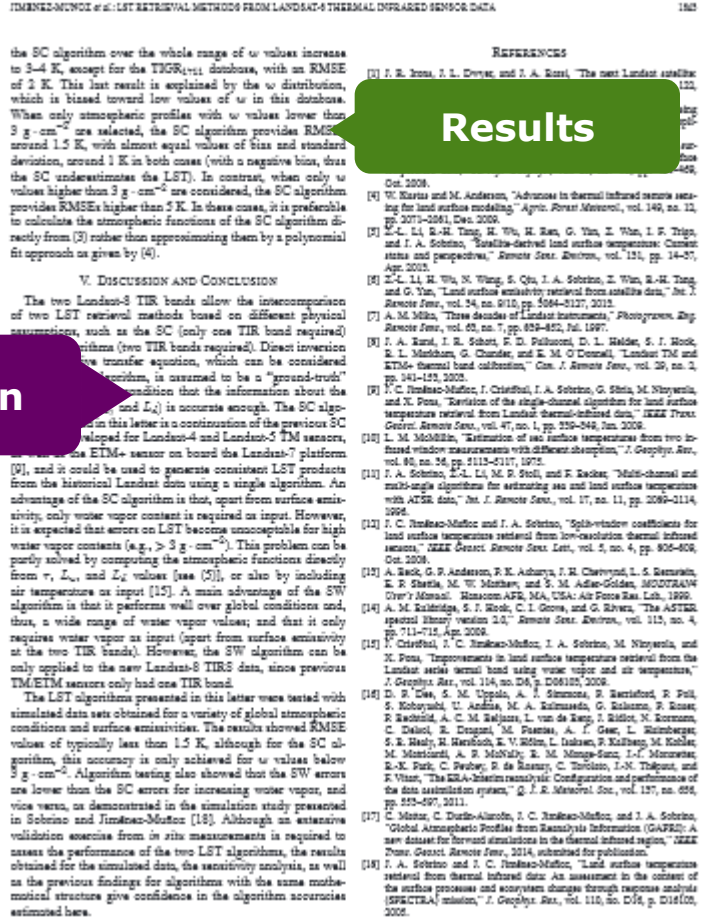
Demonstrate that you solved the problem or made significant advances

Results: Summarized Data

- Should be clear and concise
- Use figures or tables with narrative to illustrate findings

Discussion: Interprets the Results

- Why your research offers a new solution
- Acknowledge any limitations



Paper Structure

Conclusion

- Explain what the research has achieved
  - As it relates to the problem stated in the Introduction
  - Revisit the key points in each section
  - Include a summary of the main findings, important conclusions and implications for the field
- Provide benefits and shortcomings of:
  - The solution presented
  - Your research and methodology
- Suggest future areas for research

Paper Structure

References

- Support and validate the hypothesis your research proves, disproves or resolves
- There is no limit to the number of references
  - But use only those that directly support our work
- Ensure proper author attribution
  - Author name, *article title*, publication name, publisher, year published, volume, chapter and page number
  - IEEE journals generally follow a citation numbering system

Properly cited material

1536 IEEE TRANSACTIONS ON SMART GRID, VOL. 5, NO. 4, JULY 2014

We then have

$$(P_t^{b+}+P_t^{s-})^2-(P_t^{g,+}-P_t^{s-})^2+4P_t^{s+}P_t^{s-} < (\hat{P}_t^{g,+}-\hat{P}_t^{s-})^2+4\hat{P}_t^{s+}\hat{P}_t^{s-} -(\hat{P}_t^{g,+}+\hat{P}_t^{s-})^2. \quad (32)$$

Since $P_t^{b+}-P_t^{b-}=\hat{P}_t^{g,+}-\hat{P}_t^{g,-}$, we then have $P_t^{g,+}<P_t^{b+}$, and $P_t^{g,-}<P_t^{b-}$. Because the operational cost is an increasing function of $\{P_t^{g,+},P_t^{g,-}\}$, we obtain that

$$c_{o/a}(P_t^{g,+},P_t^{g,-})<c_{o/a}(\hat{P}_t^{g,+},\hat{P}_t^{g,-}). \quad (33)$$

Therefore the optimal pair $\{P_t^{g,+},P_t^{g,-}\}$ must satisfy that $P_t^{g,+}P_t^{g,-}=0$, i.e., only one of $P_t^{g,+},P_t^{g,-}$ can be non-zero. ■

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Dr. Nehorai served as Editor-in-Chief of IEEE TRANSACTIONS ON SIGNAL PROCESSING from 2000 to 2002. From 2003 to 2005 he was the Vice President of the IEEE Signal Processing Society (SPS), the Chair of the Publications Board, and a member of the Executive Committee of this Society. He was the founding Editor of the special columns on Leadership Reflections in *IEEE Signal Processing Magazine* from 2003 to 2006. He has been a Fellow of the IEEE since 1994, the Royal Statistical Society since 1996, and the AAAS since 2012.

Ethics

Ethics

Types of misconduct

Conflict of Interest

- A financial or other relationship with the publication at odds with the unbiased presentation of data or analysis

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Author Attribution

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Author involvement/ contributions

- Include any and all who have made a substantial intellectual contribution to the work
- Do not include minor contributors

Ethics

Ethical publishing

Plagiarism

- Avoid plagiarism
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  - Paraphrase reused text properly, and include citation
  - Credit any reused ideas
  - Familiarize yourself with IEEE Policies

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Ethics

Ethical publishing

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  - Is not under review for another refereed publication
  - Cites previous work
  - Indicates how it differs from the previously published work
  - Authors MUST also **inform the editor** when submitting any previously published work

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BIG DATA

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RENEWABLE ENERGY

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