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Eszter Lukács
IEEE Client Services Manager
Europe

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1790
ANALYTICS

Analysis of Patent Referencing to IEEE Papers, Conferences, and Standards 1997-2014

Report prepared for:

Institute of Electrical and Electronic Engineers
445 Hoes Lane
Piscataway, NJ 08855, USA

Report prepared by:

1790 Analytics LLC
130 Haddon Avenue
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May 14, 2015

A study of the top 40 patenting organizations ranks IEEE #1 again

- Over three times more citations than any other publisher
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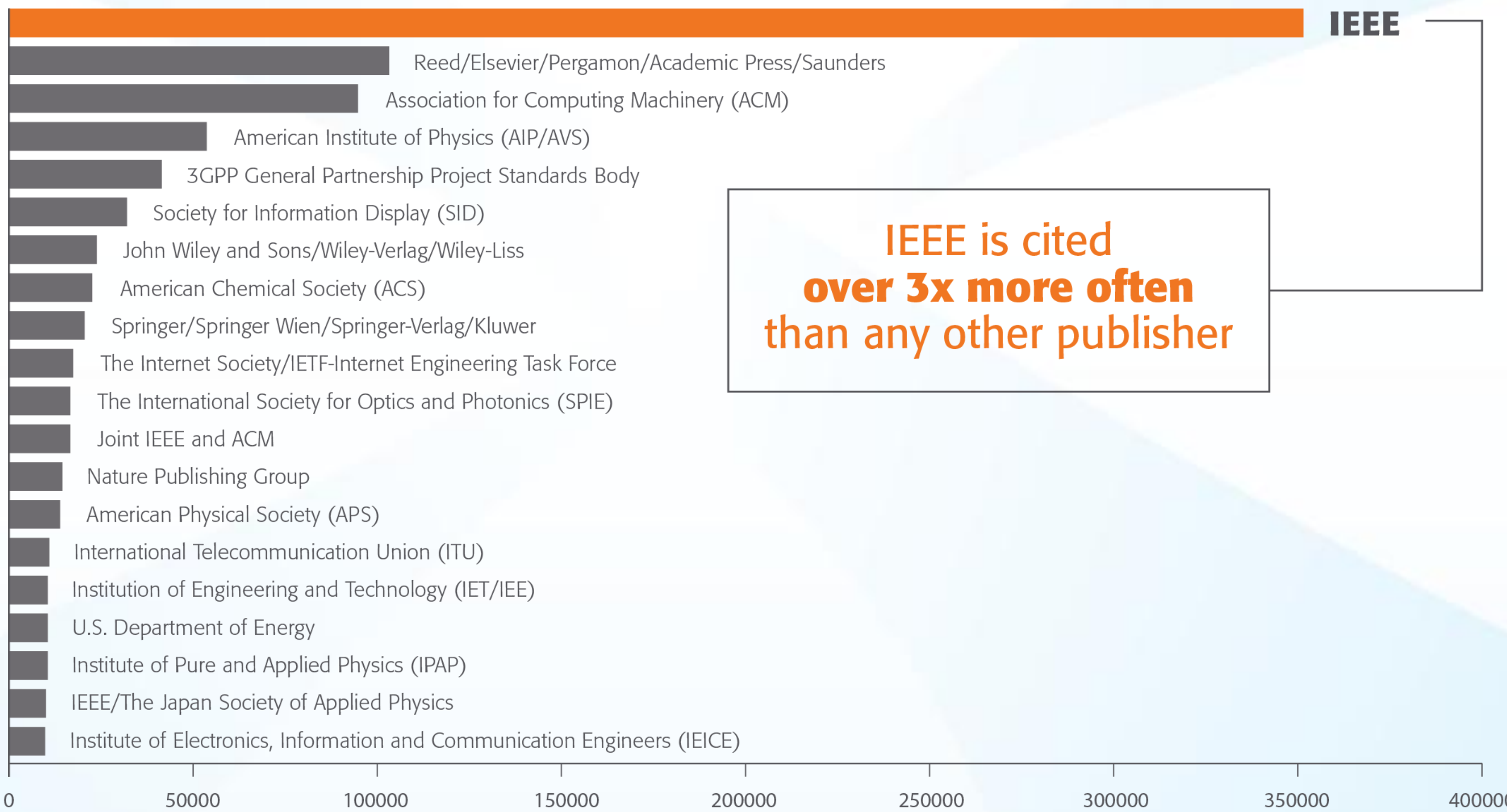

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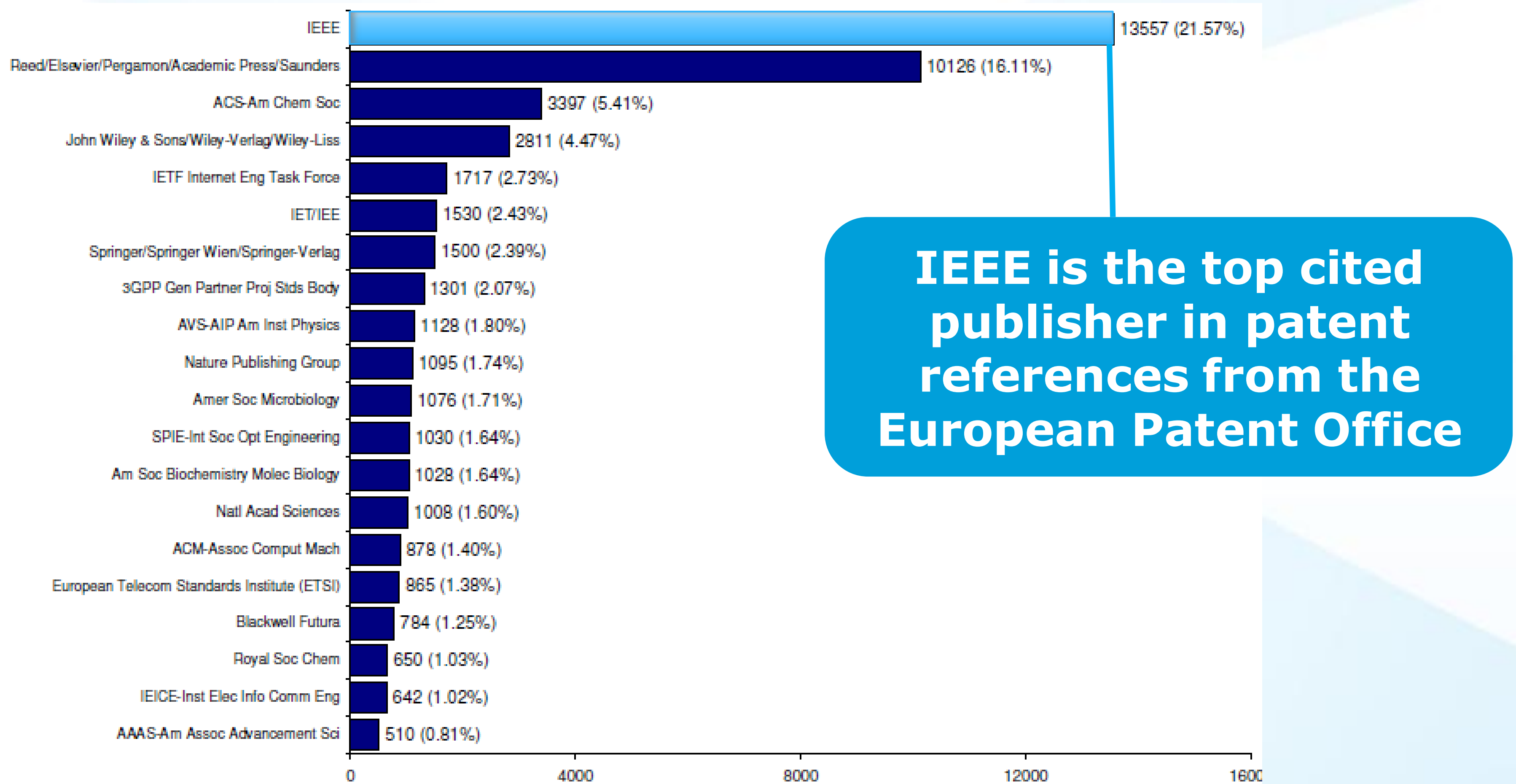

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Examples of New IEEE Conferences in 2014

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- **Humanitarian Technology** Conference, (IHTC), 2014 IEEE Canada International
- Aerospace Electronics and Remote Sensing Technology (ICARES), 2014 IEEE International Conference on
- Antenna Measurements & Applications (CAMA), 2014 IEEE Conference on
- Consumer Electronics, Taiwan (ICCE-TW), 2014 IEEE International Conference on
- Energy Conversion (CENCON), 2014 IEEE Conference on
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1979
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1979
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Utilization of the seven Ishikawa tools (old tools) in the six sigma strategy
Mach, P.; Guaqueta, J.
Electronics Technology: Concurrent Engineering in Electronic Packaging, 2001. 24th International Spring Seminar on
Year: 2001
Pages: 51 - 55, DOI: 10.1109/ISSE.2001.931009
IEEE Conference Publications
Abstract
html
(336 Kb)
Maximum efficiency of an induction machine operating in a wide range of speed and torque - part 2 (calculation, simulation and measurement results)
Vorel, P.; Hutak, P.; Prochazka, P.
Industrial Electronics (ISIE), 2010 IEEE International Symposium on
Year: 2010
Pages: 1359 - 1363, DOI: 10.1109/ISIE.2010.5637178
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Abstract
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Testing of dynamic quality of AD modules with standard interfaces and

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Year: 2001

Pages: 51 - 55, DOI: 10.1109/ISSE.2001.931009

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Abstract | html | (336 Kb)

Testing of dynamic quality of AD modules with standard interfaces and problems connected with it

Haasz, V.; Roztocil, J.

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  - Gain informal feedback to use in your research
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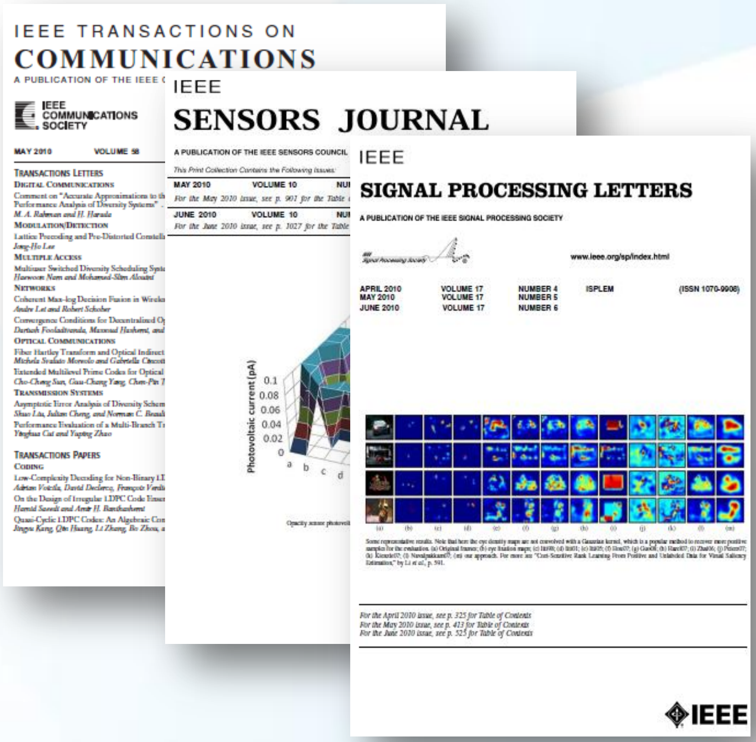

Magazines

- Magazines are characterized by regular and continuing issues with significant technical content in addition to general news and regular columns
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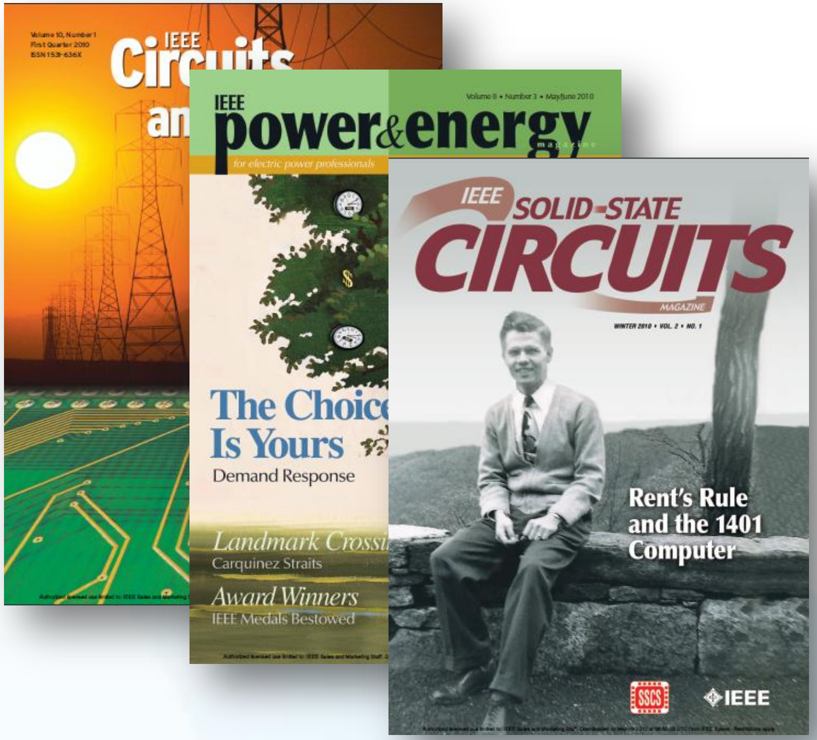
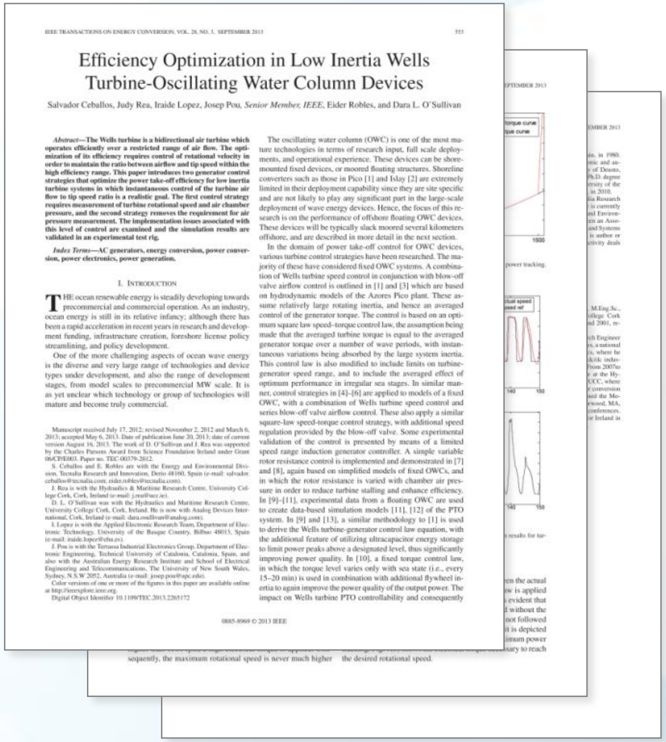


Structure

Paper Structure

Elements of a manuscript

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



IEEE TRANSACTIONS ON ENERGY CONVERSION, VOL. 28, NO. 3, SEPTEMBER 2013 553

Efficiency Optimization in Low Inertia Wells Turbine-Oscillating Water Column Devices

Salvador Ceballos, Judy Rea, Iraide Lopez, Josep Pou, *Senior Member, IEEE*, Eider Robles, and Dara L. O'Sullivan

***Abstract*—The Wells turbine is a bidirectional air turbine which operates efficiently over a restricted range of air flow. The optimization of its efficiency requires control of rotational velocity in order to maintain the ratio between airflow and tip speed within the high efficiency range. This paper introduces two generator control strategies that optimize the power take-off efficiency for low inertia turbine systems in which instantaneous control of the turbine air flow to tip speed ratio is a realistic goal. The first control strategy requires measurement of turbine rotational speed and air chamber pressure, and the second strategy removes the requirement for air pressure measurement. The implementation issues associated with this level of control are examined and the simulation results are validated in an experimental test rig.**

***Index Terms*—AC generators, energy conversion, power conversion, power electronics, power generation.**

I. Introduction

THE ocean renewable energy is steadily developing towards precommercial and commercial operation. As an industry, ocean energy is still in its relative infancy; although there has been a rapid acceleration in recent years in research and development funding, infrastructure creation, foreshore license policy streamlining, and policy development.

One of the more challenging aspects of ocean wave energy is the diverse and very large range of technologies and device types under development, and also the range of development stages, from model scales to precommercial MW scale. It is as yet unclear which technology or group of technologies will mature and become truly commercial.

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Color versions of one or more of the figures in this paper are available online at http://ieeexplore.ieee.org.

Digital Object Identifier 10.1109/TEC.2013.2265172

The oscillating water column (OWC) is one of the most mature technologies in terms of research input, full scale deployments, and operational experience. These devices can be shore-mounted fixed devices, or moored floating structures. Shoreline converters such as those in Pico [1] and Islay [2] are extremely limited in their deployment capability since they are site specific and are not likely to play any significant part in the large-scale deployment of wave energy devices. Hence, the focus of this research is on the performance of offshore floating OWC devices. These devices will be typically slack moored several kilometers offshore, and are described in more detail in the next section.

In the domain of power take-off control for OWC devices, various turbine control strategies have been researched. The majority of these have considered fixed OWC systems. A combination of Wells turbine speed control in conjunction with blow-off valve airflow control is outlined in [1] and [3] which are based on hydrodynamic models of the Azores Pico plant. These assume relatively large rotating inertia, and hence an averaged control of the generator torque. The control is based on an optimum square law speed-torque control law, the assumption being made that the averaged turbine torque is equal to the averaged generator torque over a number of wave periods, with instantaneous variations being absorbed by the large system inertia. This control law is also modified to include limits on turbine-generator speed range, and to include the averaged effect of optimum performance in irregular sea stages. In similar manner, control strategies in [4]–[6] are applied to models of a fixed OWC, with a combination of Wells turbine speed control and series blow-off valve airflow control. These also apply a similar square-law speed-torque control strategy, with additional speed regulation provided by the blow-off valve. Some experimental validation of the control is presented by means of a limited speed range induction generator controller. A simple variable rotor resistance control is implemented and demonstrated in [7] and [8], again based on simplified models of fixed OWCs, and in which the rotor resistance is varied with chamber air pressure in order to reduce turbine stalling and enhance efficiency. In [9]–[11], experimental data from a floating OWC are used to create data-based simulation models [11], [12] of the PTO system. In [9] and [13], a similar methodology to [1] is used to derive the Wells turbine-generator control law equation, with the additional feature of utilizing ultracapacitor energy storage to limit power peaks above a designated level, thus significantly improving power quality. In [10], a fixed torque control law, in which the torque level varies only with sea state (i.e., every 15–20 min) is used in combination with additional flywheel inertia to again improve the power quality of the output power. The impact on Wells turbine PTO controllability and consequently

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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

Good Title

VS.

Bad Title

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

Good vs. Better Title

An Investigation into the Effects of Residential Air-Conditioning Maintenance in Reducing the Demand for Electrical Energy

vs

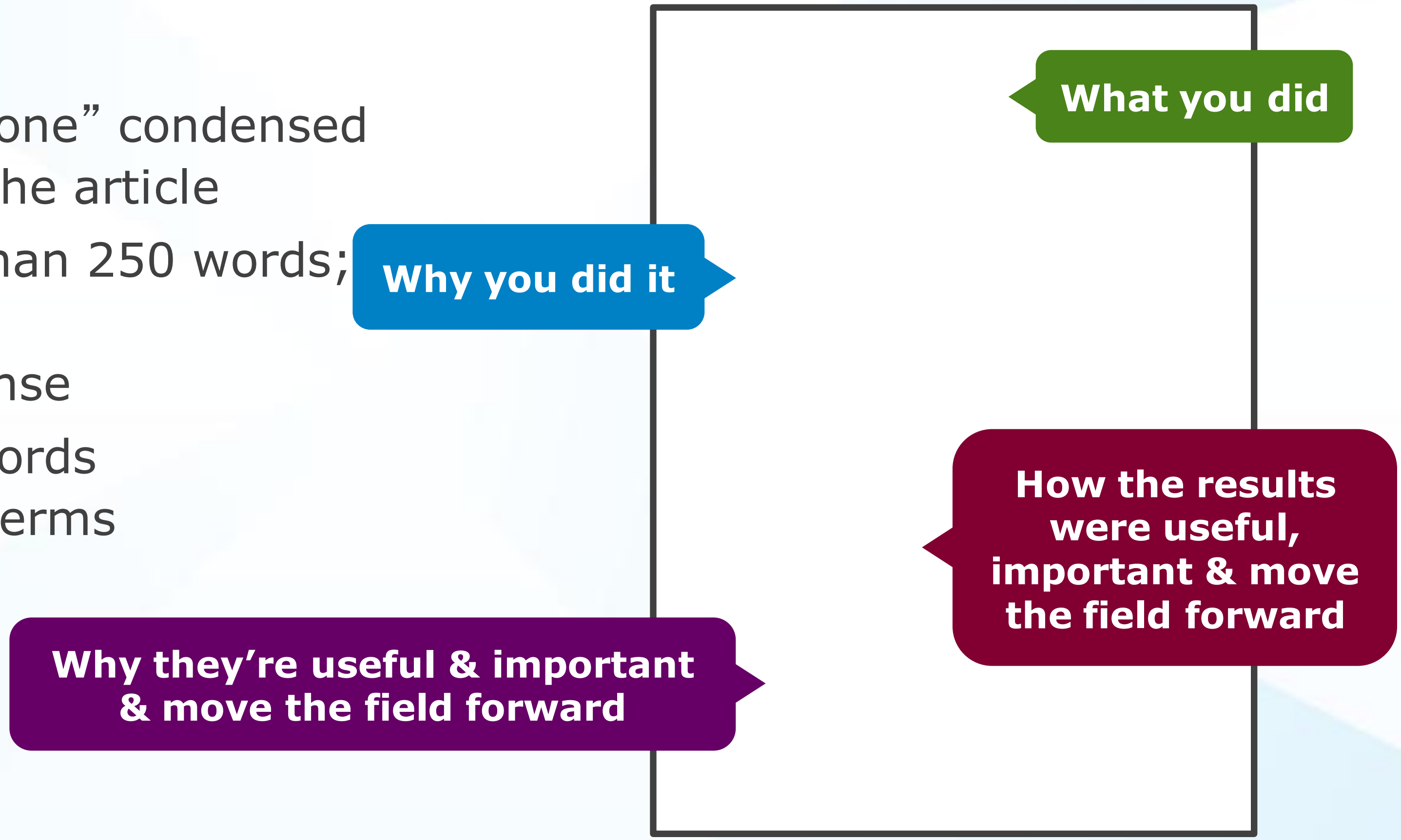
"Role of Air-Conditioning Maintenance on Electric Power Demand"

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

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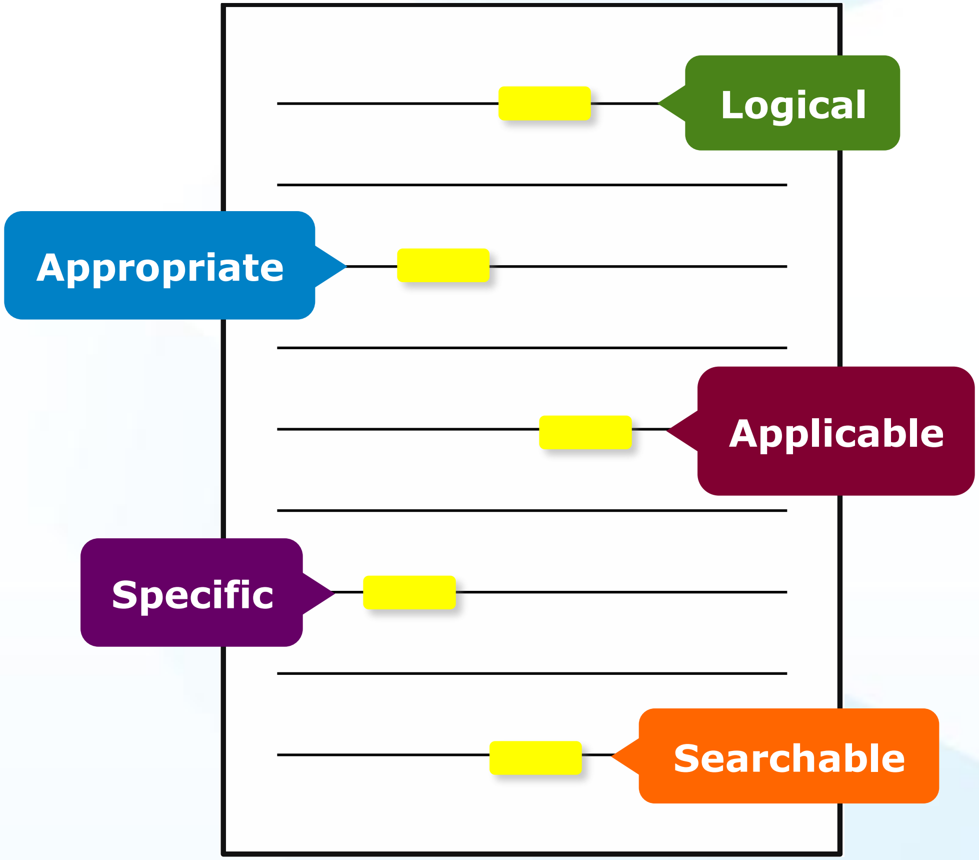
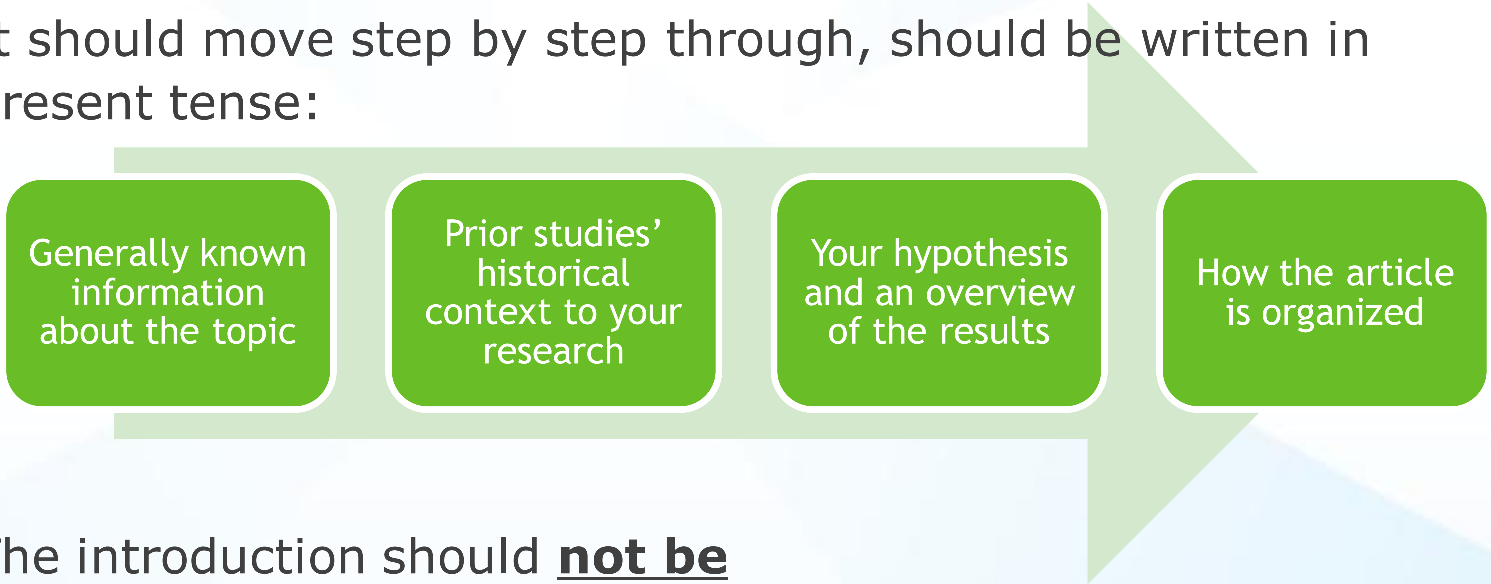
Keywords

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, should be written in present tense:



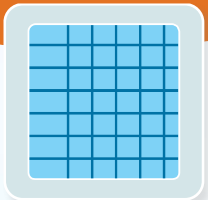
- The introduction should **not be**
  - Too broad or vague
  - More then 2 pages

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



Figures
Quickly show ideas/conclusions that would require detailed explanations

Graphs
Show relationships between data points or trends in data

Paper Structure

Results/discussion

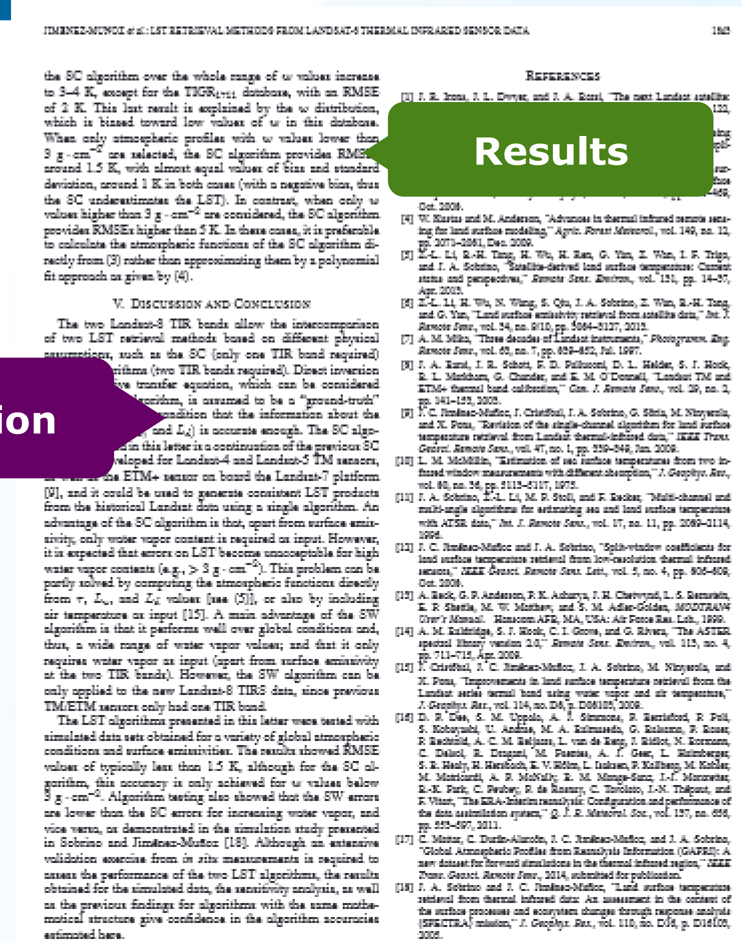
Demonstrate that you solved the problem or made significant advances

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



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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
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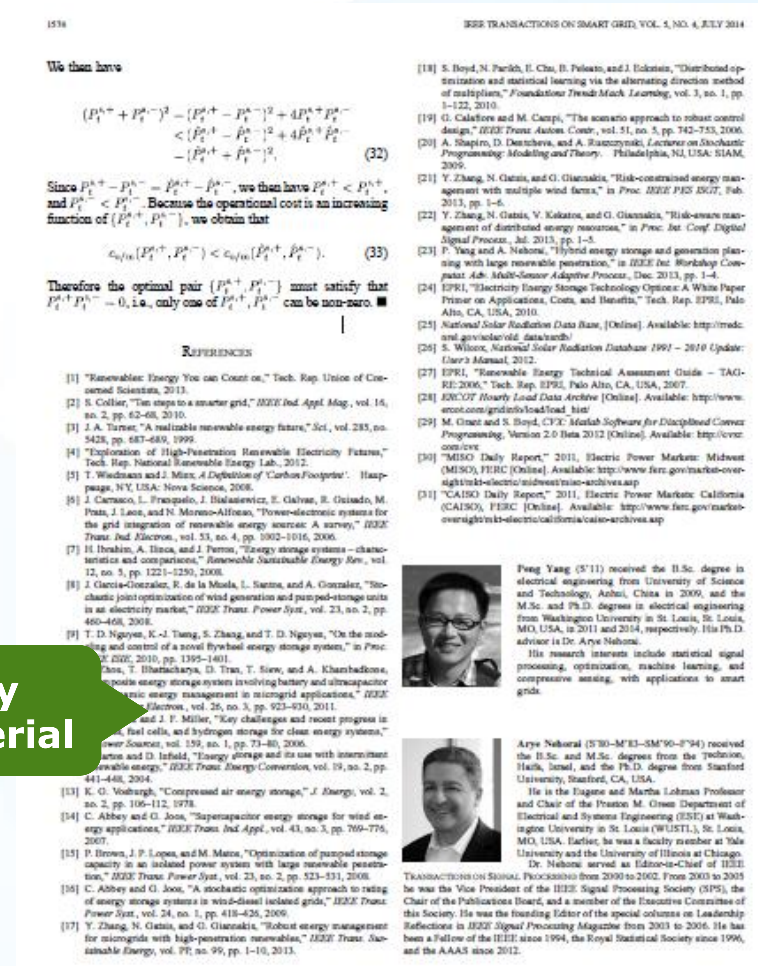

We then have

$$(P_t^{h,+} + P_t^{a,-})^2 = (P_t^{a,+} - P_t^{a,-})^2 + 4P_t^{a,+}P_t^{a,-} < (\hat{P}_t^{a,+} - \hat{P}_t^{a,-})^2 + 4\hat{P}_t^{a,+}\hat{P}_t^{a,-} = (\hat{P}_t^{a,+} + \hat{P}_t^{a,-})^2. \quad (32)$$

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

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

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

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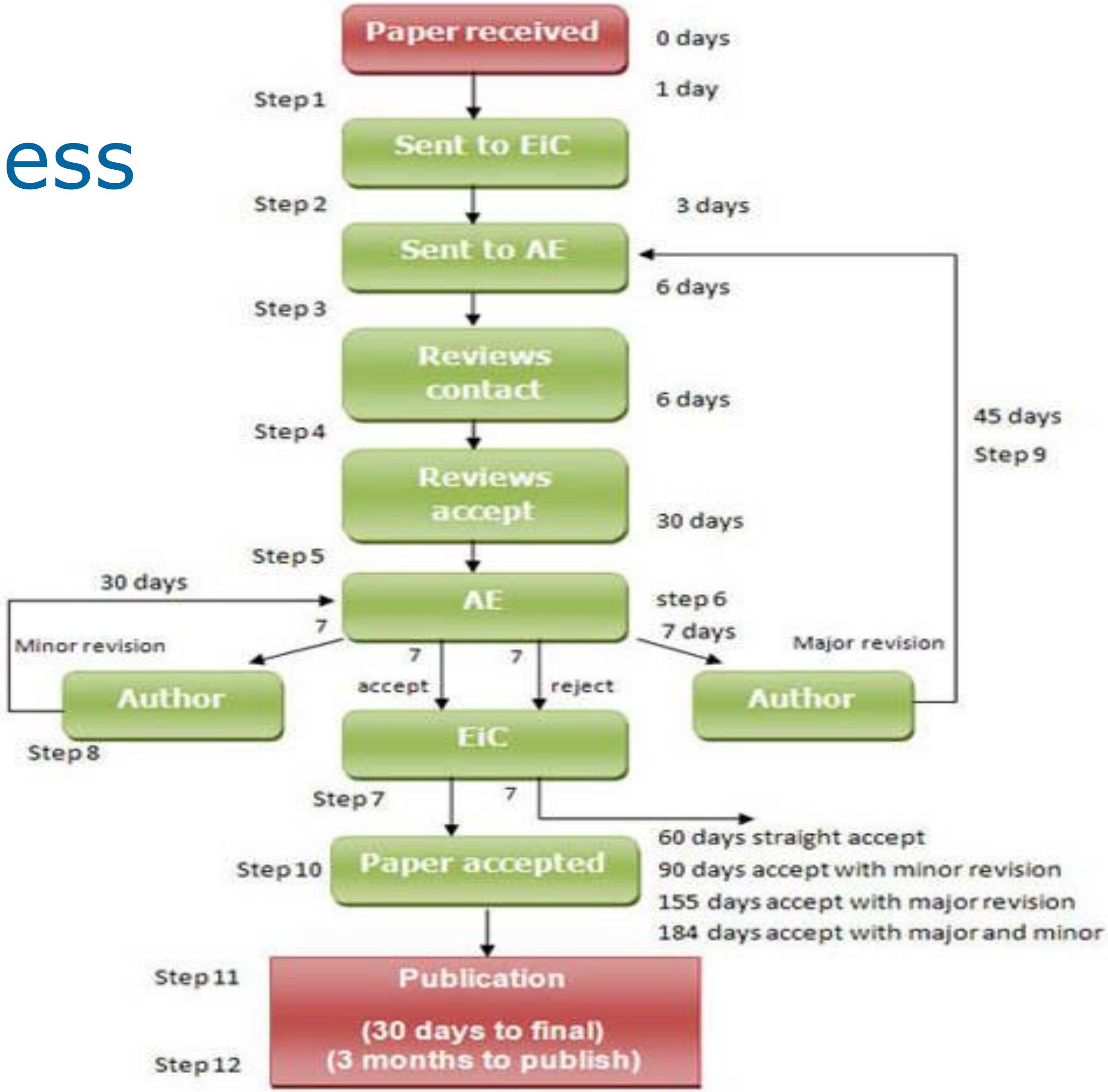

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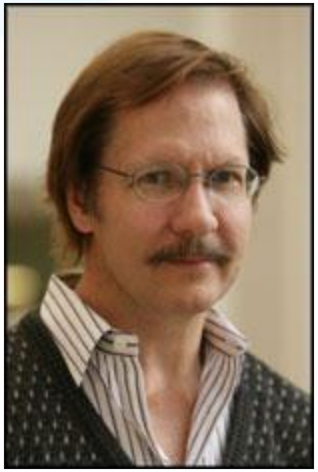

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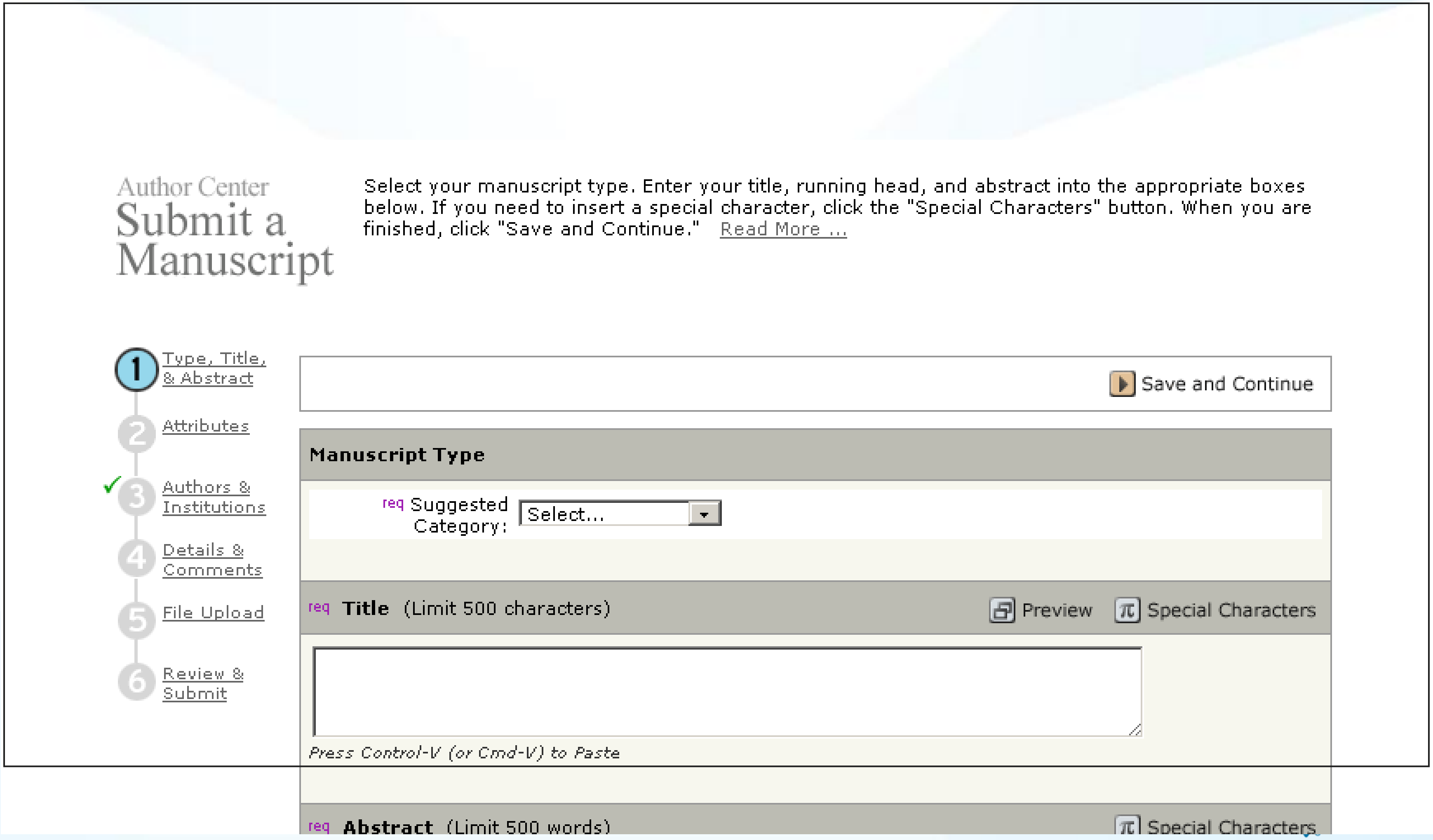

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