Session 2: Title, Abstract and Introduction

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BEFORE PUTTING PEN ON PAPER...



Before starting, ask these questions:

Is my work publishable?

- 1. Have I done **something new** and interesting?
- 2. Is there anything challenging in my work?
- 3. Is my work related to a current hot topic?
- 4. Have I provided solutions to difficult problems?

If yes to one of those, then you can start writing. If not, do some rethinking

Consider submitting manuscript to lower impact factor journal?



Always Have in Mind on the Task of Reviewers

Reviewers have to respond to questionnaires:

- Content: sufficient new material?
- Topic: within the scope of the journal?
- Presentation: concise and well organized
- Methods/experiments: can they be replicated?
- *Results: Adequate to support the hypothesis?
- Discussion: relevant, concise, well documented?



- Conclusions: Supported by the data presented?
- Language: Acceptable?
- Figures and tables: adequate and well designed? information duplicated? Are they too many?
- ❖ References: Are the cited references (in the text) included in the references list? Relevant, up-to-date?



Decide on Type of Manuscript

- Original Research Paper
- Review Paper
- Letter/Short Communication



Structure of Scientific Paper: IMRAD

- IMRAD (Introduction, Methods, Results, and Discussion)
- Introduction: What did you/others do? Why did you do it?
- Methods: How did you do it?
- Results: What did you find?
- And
- Discussion: What does it all mean?

Of course, an article begins with the Title, Abstract and Keywords



Choosing the "Correct" Target Journal

- Easiest way: Study the articles you have consulted (cited) in your manuscript.
 - Probably most of them are concentrated in one or two journals.
 - Read very recent publications in each targeted journal; determine hot topics and the types of articles that are accepted.



Journal Selection

- "Ambition" versus "Reality"
 - If your research results are not very competitive, go for journals with lower Impact Factor.

- Multiple/concurrent submissions
 - Don't gamble by (unethical)
 - Only submit once and wait for the response of the editor and the reviewers.



Review Speed Consideration

- Very important, but quite subjective.
- It depends on reviewers response and Editorial Team efficiency
- Elsevier provides a good tool to find various information about the targeted journal, including <u>Review Speed</u>

http://journalfinder.elsevier.com/



Study the Guide for Authors.

- After selecting the journal, go to the web page and download the Guide for Authors. Print and read it!
- It contain editorial guidelines, submission procedures, fees, copyright and ethical issues.
- Try to apply: text layout, references citation, nomenclature, figures and tables, etc.
- All editors hate poorly prepared manuscripts that does not adhere to its Guide to Authors. It shows no respect.



Storyline

- The paper must have a clear storyline.
 - It should have one or two central issues that you want to address.
 - Do not "cloud" the paper with too many issues until readers become confused.
 - The selected issues become the theme/direction of the paper
 - Build the storyline around the issue.
- The hypothesis, objective must be well articulated.
- There must be a take home message



THE TITLE



Title of the Article

- Extremely important.
- Looks trivial, but not so.
- It is a "summary" and "essence" of your paper in no more than 12 words
- Should be "encompassing" as well as "descriptive".



What Makes a Good Title

- Condenses the paper's content in a few words
- Captures the readers' attention: show your specialty and strength
- Differentiates the paper from other papers of the same subject area



Formulating a Title: Basic Tips

- Use simple and concise statements
- Utilize Thesaurus to get more options for words (be careful to fully understand how the alternative word is used in what context!)
- List down key (important) words that is central to the paper
 - USE WORD COUNT.



Title: What to avoid

- Redundancies.
 - Example:
 - "On the design of..."
 - Can be simplified to: "Design of..."
 - Example:
 - "...building and constructing of a simplified..."
 - Can be rephrased as: "...development of a simplified...:
- Acronyms (depends on journal).
- Avoid words such as "novel", "new", "original" unless they really are.
- Be modest: Use "improved", instead



Title: Good Examples

- An Improved Particle Swarm Optimization (PSO)-Based MPPT for PV with Reduced Steady-State Oscillation (show your strength, specialty)
- Simple, fast and accurate two-diode model for photovoltaic modules". (show your strength)
- Solar charging of electric vehicle using solar photovoltaic: A critical review (show your specialty)
- Analysis, Design and Implementation of Multiple Parallel Ozone Chambers for High Flow Rate (show your specialty)



Title: Poor Examples

- Design of Particle Swarm Optimization (PSO)-Based MPPT (nothing special)
- Two-diode model for photovoltaic modules (too general).
- Design and Implementation of Multiple Parallel
 Ozone Chambers



Keywords

- Crucial when search is done for articles from databases
- Carefully choose words that represent the theme of the paper
- Not too general, e.g. physics, science, engineering, power
- Not too specific such that your paper cannot be discriminated during search



ABSTRACT



What is an Abstract?

- In approximately 150–250 words, you need to summarize your contribution, idea, findings/results, and describe implications of the findings.
- A powerful representation of your article.
 - Its a microcosm of the full article.
 - Correctly written, it can contain a complete description of your research.
- It gives the "first impression"
 - It decides whether the article pertains to the readers interests and needs.
 - The entry point to get into the review system



Abstract Features

- Single paragraph
- Self-contained (independent)
- Without abbreviations, footnotes, or references.
- Should not contain mathematical equations, diagram or tabular material.
- Three or four different keywords or phrases, as this will help readers to find it.
- Reads well and is grammatically correct.



Important Elements of Abstract

- 1. State the *primary objective* of the paper.
- 2. Highlight the merits (or *contribution*).
- 3. Give a conceptual idea on the method
- 4. Describe the research design and procedures/processes employed (is it simulation, experimental, survey etc.)
- 5. Give the *main outcomes or results*, and the *conclusions* that might be drawn.
- 6. Include any *implications* for further research or application/practice, if any.



Abstract Example No. 1

"This paper proposes an improved maximum power point tracking (MPPT) method for Photovoltaic (PV) system using a modified particle swarm optimization (PSO) algorithm. The main advantage of the method is the simplicity and speed of the algorithm such that it can be computed rapidly using a low cost microcontroller. The speed of convergence is achieved by forcing the PSO into a non-random mode, thus avoiding the need to deal with the uncertainty of random numbers. To test the effectiveness of the proposed method, MATLAB simulations are carried out under very challenging conditions, namely step changes in irradiance, step changes in load and partial shading of PV array. In addition, an experimental rig that comprises of a buck-boost converter fed by a custom-designed solar array simulator is set-up to emulate the simulation. The superiority of the proposed method over the conventional Hill Climbing (HC) is confirmed by a 30% increase in the convergence speed and a 50% decrease in the steady state oscillations. It is envisaged that the method can be very useful in the design of a practical high performance, low cost inverter with MPPT." (180 words)

ADOPTED FROM:

K. Ishaque, **Z. Salam**, M. Amjad, and S. Mekhilef, "An Improved Particle Swarm Optimization (PSO)-Based MPPT for PV With Reduced Steady-State Oscillation", *IEEE Transactions on Power Electronics*, vol. 27, pp. 3627-3638, 2012.



Good Abstract? Let's check

1. State the *primary objective* or hypothesis of the paper clearly.

"This paper proposes an improved maximum power point tracking (MPPT) method for Photovoltaic (PV) system using a modified particle swarm optimization (PSO) algorithm."

2. Highlight the **merits** (or contribution) of the paper in the strongest possible words.

The main advantage of the method is the simplicity and speed of the algorithm such that it can be computed rapidly using a low cost microcontroller.



3. Give a conceptual idea (method) on how the contribution is achieved.

The speed of convergence is achieved by forcing the PSO into a non-random mode, thus avoiding the need to deal with the uncertainty of random numbers.

4. Describe briefly the research design and **procedure** employed

To test the effectiveness of the proposed method, MATLAB simulations are carried out under very challenging conditions, namely step changes in irradiance, step changes in load and partial shading of PV array. In addition, an experimental rig that comprises of a buck-boost converter fed by a custom-designed solar array simulator is set-up to emulate the simulation.



5. Give the *main outcomes or results*, and the *conclusions* that might be drawn from these data and results.

The superiority of the proposed method over the conventional Hill Climbing (HC) is confirmed by a 30% increase in the convergence speed and a 50% decrease in the steady state oscillations.

6. Include any implications for further research or application/practice, if any.

It is envisaged that the method can be very useful in the design of a practical high performance, low cost inverter with MPPT.



Example No. 2

This paper proposes an improved modelling approach for the twodiode model of photovoltaic (PV) module. The main contribution of this work is the simplification of the current equation, in which only four parameters are required—compared to six or more in the previously developed two-diode models. This is achieved by equating the values of the series and parallel resistances, and subsequently computing them using fast iterative method. To validate the accuracy of the proposed model, six PV modules of different types (multi-crystalline, mono-crystalline and thin-film) from various manufacturers are tested. The performance of the model is evaluated against the popular single diode models. It is found that the proposed model is superior when subjected to irradiance and temperature variations. In particular the model matches very accurately for all important points of the I-V, i.e. by less than 1%. The modelling method is useful for PV power converter designers and circuit simulator developers who require simple, fast yet accurate model for the PV module.

Objective

Merit

Idea

Procedures

Results

Implications

ADOPTED FROM:

Kashif Ishaque, **Zainal Salam**, Hamed Taheri, "Simple, fast and accurate two-diode model for photovoltaic modules", *Solar Energy Materials & Solar Cells*, 95 (2011) 586–594.



Make sure to do proof reading!

A complaint from an editor:

"This paper fell well below my threshold. I refuse to spend time trying to understand what the author is trying to say.

Besides, I really want to send a message that they can't submit garbage to us and expect us to fix it.

My rule of thumb is that if there are more than 6 grammatical errors in the abstract, then I don't waste my time reading the rest."



Common Mistakes in Abstracts

- Writing "historical" information
- The use of generic words: high, low, small, big.
- Storyline in Abstract not sequential
- Not proof read



Example of Poor Abstract

Large and small scale PV power systems have been commercialized in many countries. One of the important approach for system design is to use simulators to predict the output of PV systems under varying environmental conditions. This paper proposes a MATLAB Simulink simulator for photovoltaic (PV) system using two-diode model. This model has better accuracy at low irradiance level, thus allowing for a more accurate prediction of PV system performance. To reduce computational time, values of R_p and R_s are estimated by an efficient iteration method. Furthermore, all the inputs to the simulator are information available on standard PV module datasheet. The results are found to be very accurate for five PV modules of different types (multi-crystalline, mono-crystalline, and thin-film) from various manufacturers.



What's wrong?

Large and small scale PV power systems have been commercialized in many countries. One of the important approach for system design is to use simulators to predict the output of PV systems under varying environmental conditions. This paper proposes a MATLAB Simulink simulator for photovoltaic (PV) system using two-diode model. This model has better accuracy at low irradiance level, thus allowing for a more accurate prediction of PV system performance. To reduce computational time, values of $R_{\rm p}$ and $R_{\rm s}$ are estimated by an efficient iteration method. Furthermore, all the inputs to the simulator are information available on standard PV module datasheet. The results are found to be very accurate for five PV modules of different types (multi-crystalline, mono-crystalline, and thin-film) from various manufacturers.



Writing a Structured Abstract



Choose the exact word to describe the objective

- Propose a method
- Evaluate
- Design
- Assess
- Establish
- Predict
- Determine
- Develop
- Examine
- Constructs
- Investigate

- Navigate
- Provide (something)
- Improve the understanding
- Review (normally for review papers)
- Compare, critically compare
- Comprehensively summarize

Write the primary objective.

proposes a method (technique, solution)...

improves the technique...

is carried out to gain a better understanding of ...

is performed to objectively measure and assess ...

examines the relationship between ...

compares the two ways of treating ...

critically examines the ways in which ...

evaluates a new method of measuring ...

is carried out to provide the systematic account of ...

Is written to understand the views and experiences of ...

reviews the details the available information on ...

This paper (work)



The Idea

- 1) The idea (concept theory, model, hypothesis, solution) is based on...
- 2) The proposed approach utilized (uses, exploits, operates)...
- 3) The problem is solved by employing...
- 4) A concept known as ABCD is applied to reduce...



The Idea

- 5) By introducing two new parameters to the model, the effect of xx is...
- 6) By applying the concept known as XYZ the problem is transformed from multi-objectives to a single one.
- 7) Unlike previous approach—which did not consider.... the proposed method takes into account...



Contribution

- 1) The main (prime) advantages (contribution) of the proposed methods are...
- 2) There are several improvements that result from the introduction of..
- 3) One of the important benefits of the proposed work is...
- 4) The approach has several notable merits, namely...



Contribution

- 5) Unlike the normal approach, this method improves the..
- 6) The proposed method overcomes the problems associated with...
- 7) There are two distinct differences between this work and the previous...
- 8) Despite the difficulties imposed by the authorities, the proposed method is able to...
- 9) Although the proposed approach faces numerous challenges, it successfully...



Procedures

- 1) The idea is proven in three ways: analytically, simulation and experimental prototype.
- 2) A comprehensive verification using MATLAB is carried out to determine...
- 3) The performance of the proposed method is evaluated using the standard procedures...
- 4) The viability of the concept is assessed based on...
- 5) The errors are quantified using a special equipment...



Procedures

- 5) To validate the hypothesis, the standard statistical analysis is...
- 6) The tests are carried out using ...
- 7) The software codes are benchmarked against the...
- 8) Verification using numerical method is chosen because...
- 9) To ensure that the results are acceptable to the practitioner in this field, a strict procedures are applied, namely...



Results

- 1) From the experimental (simulation) work, it was found (discovered) that...
- 2) The result indicates (shows, reveals, confirms) that...
- 3) There is a xx% increase in the value of...
- 4) Despite the xx% increased in cost in, the data show that the efficiency is improved by yy%.



Results

- 5) The promising part of the method is the improvement shown in the...
- 6) The xx% error between he simulation and results from the hardware prototype suggests that...
- 7) The superiority of the proposed method over the conventional approach is confirmed by a xx % increase in the computational speed



Implications

- 1) It is envisaged (expected) that this work will benefit a large number of professionals...
- 2) The method proposed in this paper is predicted to be the main driver...
- 3) The conclusion of the study suggests that the of research in this area could be directed toward...



Implications

4) The work can be considered significant due to the fact that..

- 5) Looking into the future, this work will lead to...
- 6) The results published in this paper opens up several important possibilities...



Example: Structure the Skeleton

- This paper proposes... (objective)
- The solution is based on... (idea)
- The approach has several notable merits, namely... (contribution)
- A comprehensive verification using MATLAB is carried out to determine... (procedures)
- From the simulation work, it was found found that...(results)
- The result confirms that the method... (results)
- The method proposed in this paper can be used... (implication)



Write it Out!

This paper proposes an improved method to reduce the high voltage spikes during switch turn-off for a buck dc-dc converter. The solution is based on the idea that the slower gate signal can improve the turn-off at transient. The approach has several notable merits, namely low cost, reduced components and higher safety. A comprehensive verification using MATLAB is carried out to determine the effectiveness of the concept. From the simulation work, it was found that the spikes was reduced by 75% for switching frequency between 500-800 kHz. The result confirms that the method is superior to the alternative snubber network, which exhibits 50% reduction for the same frequency range. The method proposed in this paper can be used for all types of dc-dc converter because it can be readily retrofitted to the existing system.



IF YOU KNOW HOW TO STRUCTURE THE ABSTRACT, ITS EASY, ISN'T IT?

DO SOME PRACTICE!



THE INTRODUCTION



Aims of the Introduction Section

- To define the problem/issue
- To connect the issue to previous relevant research
- To identify the research gap, inadequacies of previous research
- To state your solution/objective/ hypothesis/idea
- To justify the significance/importance of your work



What are Issues to be Considered??

- What is the problem to be solved?
- Are there any existing solutions?
 - Which is the best among the existing solution?
 - What is its main limitation?
- What is your idea to overcome the limitation?
- How is your solution better than the rest?

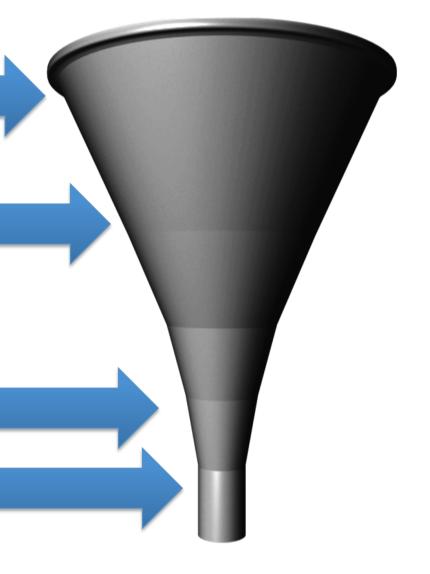


The Logical Funnel

Provide an Overview

Discuss
Focused Literature

- ➤ Identify the GAP
- Propose the solution





Example of Introduction

ADOPTED FROM

Muhammad Amjad, **Zainal Salam**, "Analysis, Design and Implementation of Multiple Parallel Ozone Chambers for High Flow Rate", *IEEE Transactions Industrial Electronics*, Vol. 61, No. 2, Feb 2014, pp. 753-765.



Overview

"Ozone is a powerful oxidizing agent that has been increasingly used in industrial, pharmaceutical and agriculture applications [1]-[3]. Unlike other oxidizing chemicals such as chlorine, it leaves no harmful residue to the environment."

General statements: motivational in nature, easy to understand.

General reference are cited

The most viable method to generate ozone by using the dielectric barrier discharge (DBD) that is powered by resonant converter [4]."

Becoming more specific; not easily to be understood.

Trying to link to the "focused" literature.



Focused Literature

"Among the resonant inverters, the full-bridge [5], push-pull [6], and class E resonant circuits [7] are widely employed. In majority of the cases [5]-[10], high frequency transformer is utilized to boost the voltage to a sufficiently high level to initiate ozone formation."

This is the "focused" literature.

Giving the reader information of the related previous work.

The theme of the paper is slowly being established.



Looking for "the Gap"

"Despite the simplicity of resonant inverter, its transformer exhibits several disadvantages: 1) decreased efficiency, 2) high voltage spikes and (3) introduction of electromagnetic

interference [8]."

See how the inadequacy of the previous work is exposed?

Use "CONTRAST"

cohesive
phrase for "smooth"
transition to expose the gap

Despite the fact... On the contrary... On the other hand... However,... Conversely... Having said that... But then... Alternatively,... Another possibility would be... In comparison...

Even though...



Proposing your idea!

Once the "gap" or "inadequacy" is established, propose your solution to the issue. This will be the main contribution of your paper

"In view of these shortcomings, an improved transformer-less resonant inverter is proposed in this paper."

These "linking phrases" may help

Based on these findings...
In light of these conclusions...
From the above discussions, it is clear that...
Regardless of the points made by...



Reinforcing your idea...

Giving a couple of merits of your proposed idea would make your argument more convincing.

"The key benefits of the proposed resonant inverter topology are simplicity and lower cost.

Another advantage of the proposed technique"

Alternatively you can try the "reversed psychology" approach

"Interestingly, to date no researcher has exploited the characteristic the resonant topology". This may be probably due to impression that..."



Now tell a bit of detail on how your idea will work

The idea is based on the of current sharing of two switches. Unlike other approaches thus far—which rely on voltage division, the resonant current is forced to flow into the power switches."

Just reveal a bit, perhaps the main principles that may catch the interest of reader.

Something like a summary of the idea



Paper outline

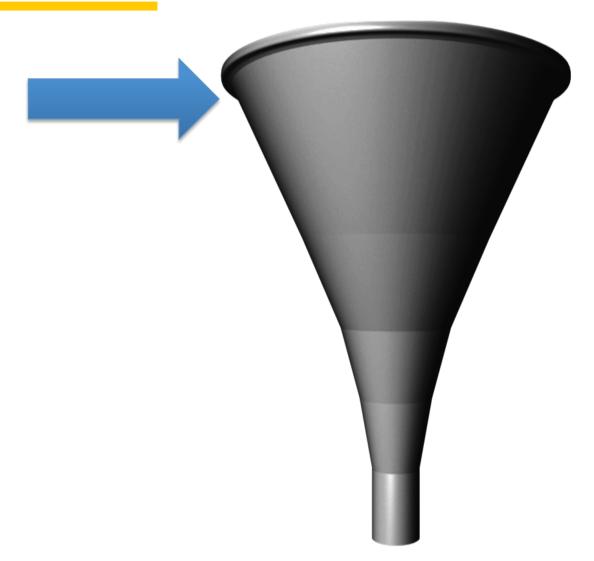
"The remaining of the paper is organized as follows. In section II, the ozone chamber parameter determination is explained. In section III, the complete ozone generation system is presented. Finally, the conclusions and future recommendation are given section IV."

Not necessarily... but its nice to put in, if you have extra pages.



Style in Writing Overviewl

Provide an Overview





Examples of Recommended Phrases (1)

1) During the past twenty years, much more information has become available on ...

- 2) A considerable amount of literature has been published on the issue. These studies ...
- 3) In recent years, there has been an increasing amount of literature on ...



Examples (2)

- 4) The first serious discussions and analyses of the issue emerged during the early 1980s with
- 5) Historically, research investigating the factors associated with this issue has focused on ...
- 6) What we know about the issue is largely based upon empirical studies that investigate how ...



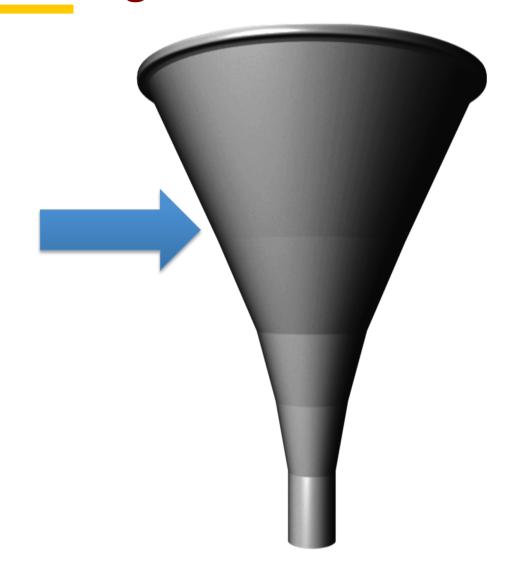
Examples (3)

- 7) For many years, this phenomenon was surprisingly neglected by ...
- 8) There is a large volume of published studies describing the role of ...
- 9) Over the past decade, most research in the issue has emphasized the use of ...



Writing Focus Literature

Discuss Focused Literature





Highlighting similar findings (1)

- 1) Similarly, Author in [1] found that ...
- 2) Authors in [1] added that the ...
- 3) The idea is supported by study in [1], which reveal that ...



Highlighting similar findings (2)

- 4) Author in [1] also provided and found similar results to those obtained in [2]...
- 5) In addition to work of Author A, Author B conclusively agree to...
- 6) The findings is in agreement with the findings of past studies by Author A, which ...



Highlighting similar findings (3)

- 7) The above findings is consistent with the study by Author...
- 8) Similar methodology is used by [1], which concluded that ...
- 9) Finding by Author A also points towards the results work in [4].



Highlighting Contradictions (1)

- 1) Author in [1] found certain differences, suggesting that ...
- 2) In contrast, the study by [1] indicated that...
- 3) The above findings contradict the study by [1]...
- 4) However, a number of studies show that significant differences do exist, albeit findings are somewhat contradictory.

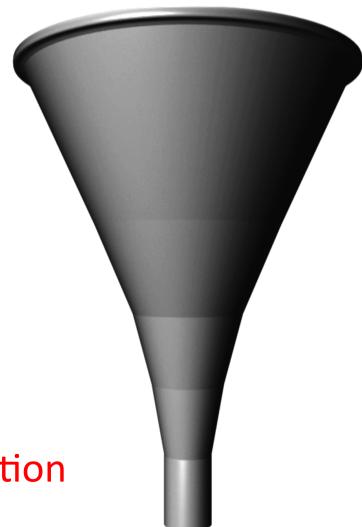


Highlighting Contradictions (2)

- 5) Interestingly, this is in contrary to a study conducted by [1], which concluded tha...
- 6) Despite the extensive evidence provided by [2], there appears to be a wide difference...
- 7) These results were contradicted by the experiments in [1] which were considered as the de-facto procedures in this field..
- 8) However, it was later shown by Author A that the results did not conform to the...



The GAP



- ➤ Identify the GAP
- ➤ Propose the solution



Examples of Contrast Cohesive Phrases (1)

- 1) From the overview, it can deduced that there is little published data on...
- 2) Despite the numerous work carried out on the same subject, no previous study (work, research, investigation) has thoroughly investigate... Hence this work..
- 3) As highlighted in [1], the application of X has not been systematically (methodologically, scientifically) investigated... There is a need for...



Contrast Cohesive Phrases (2)

- 4) Even though there has been quantitative analysis of..., no detailed investigation of ...
- 5) In contrast to popular assumptions, the data about the efficacy... it appears that...
- 6) On the contrary, few studies have investigated X in any systematic way ...



Contrast Cohesive phrases (3)

- 7) Up to now (so far, until recently), little (scant, limited) attention has been paid to ...
- 8) On the other hand, a search of the literature revealed that limited studies have focused on ...
- 9) Since the impact of X on Y is understudied, there is a need to...



Contrast Cohesive phrases (4)

10) Despite these shortcomings, there have been no studies which compares ... Hence this work...

- 11) Up to now, there are very limited studies that investigated the association between ...
- 12) Only recently, large-scale studies are performed to investigate the prevalence of However, it appears that they are inadequate to characterize...



Contrast Cohesive phrases (5)

- 13) Although studies have recognized X as the source of the problems, research has yet to systematically investigate the effect of ...
- 14) Since the publication of X forty years ago, there has only been a limited amount of original research into the history of ...



Contrast Cohesive Phrases for Review Paper (1)

- 1) So far, there has been very few work that review the....
- 2) In addition, no paper has comprehensively review...
- 3) Surprisingly, the review of the subject has not been thoroughly carried out...
- 4) Despite the large proliferation of literature on this subject, there appears to be an absence of...



Contrast Cohesive Phrases for Review Paper (1)

- 5) Although these exist a number of review paper in this field, they are not comprehensive...
- 6) The review undertaken by [1] is rather superficial, and it is unclear to what extent ... A more critical evalution is required to assess...
- 7) In contrast to the previous review paper, there is much less information about effects of ...



Contrast Cohesive Phrases for Review Paper (2)

- 8) Despite the importance of the subject, there appears to be a lack of a comprehensive review of...
- 9) Although there exists several excellent review papers on the subject, the focus is not on...
- 10) Due to the importance of the work, and the lack of a critical evaluation on the state-of-the art technologies, it is commendable for a comprehensive...

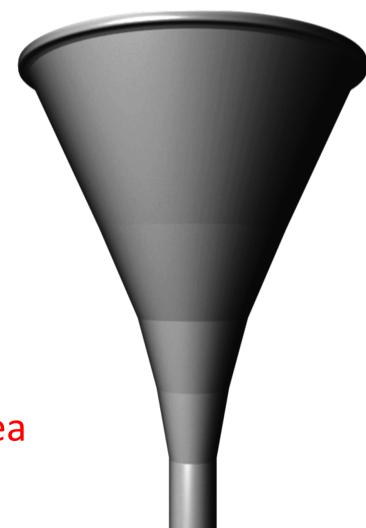


Contrast Cohesive Phrases for Review Paper (3)

- 11) The last review on this subject was carried out twenty years ago. Since then, there has been tremendous development... Therefore, it is high time for an update...
- 12) Since there is a lack of a systematic review of the subject for the last ten years, it is crucial to carry out...
- 13) Since the information on the subject is scattered in various journals, conference proceedings and patents, it is convenient to gather them in a single document. Hence this review.



Strengthen your Idea!



- Reinforce your idea
- ➤ Outline of paper



Re-enforcing your Idea (1)

- 1) This work is very important (crucial, significant, vital), considering the fact that...
- 2) Since there is an absence of experimental validation, this work will pave the way for...
- 3) The findings of this study will help ...
- 4) The contribution of this study is obvious; the resulting outcomes can be capitalized as guidelines to ...



Re-enforcing your Idea (2)

- 5) The current study contributes to our knowledge by addressing four important issues. First, ...
- 4) The current study contributes to the expansion of the knowledge in this field by addressing four important issues. First, ...



Bottom line:

You need to write the Introduction in such a way that the reviewer is convinced that the paper is good, exciting, important and he could not refuse to read the paper further.

If you achieve that goal, your Introduction is Excellent!





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