

## **VES Institute of Technology**

## **Department of Computer Engineering**

Workshop on

# Fostering Innovation & Research

Guidelines 15/07/2021 Dr. Sharmila Sengupta



## Roadmap for Research

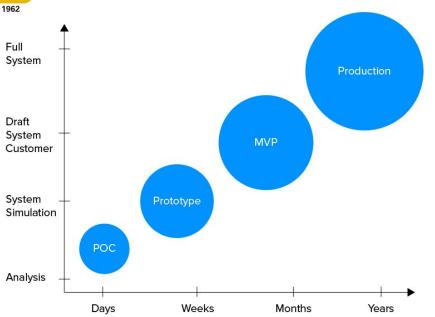








## POC/prototype





Ref: Testing an idea



## Research problems

#### **Machine Learning and Artificial Intelligence**

- Natural language understanding
- Intelligent control systems

#### **Cloud Computing**

- Large-scale natural language modeling and translation
- Cloud-based mining and learning algorithms

#### Cybersecurity

- Wireless Sensor Network Security
- Privacy-Preserving Data Mining

#### **Databases and Data Mining**

- Text/image clustering and categorization
- Biological/medical data mining

#### **Multimedia Systems and Apps**

- Automatic target recognition, surveillance
- Tracking human behaviour

#### Biomedical Informatics/ Imaging and Visualization

- Disease analysis
- Automation of forensic DNA analysis
- Detection and visualization of images pre and post surgery

#### **Assistive Technologies and Learning with Disabilities**

- Rehabilitation Assistants
- Multimodal forms of representation for virtual learning environments

#### Semantic, Social and Sensor Webs

- Computer assisted document interpretation tools
- Information extraction from semi-structured documents

#### Wireless Networking and Security

- Music telepresence
- Cognitive radio and dynamic spectrum access
- Secure protocol and secure processors authentication
- Telemedicine



## Solving issues related to SDGs

Accessibility

**Data and Statistics** 

Inequality

Mental Health and Development

Poverty

**Natural Disasters** 

**Urban Development** 

Women and Girls

Disability-inclusive humanitarian action

















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### Guidelines: Selection of research problem

- How are you contributing?
- Knowledge discovery, invention, integration, application, gap identification

Plan: Identify and Define the Topic of Interest and focus on a more narrow area

- Review Relevant Literature (Print Material, Article, Books, Organizational Reports, Government publications and telephone directories)
- Survey ( Discuss/Interact with People Around You)
- Identify the Research gap (Missing or Less Focussed Link)

Step 1 -	Selection of interested area
Step 2 -	Literature survey
Step 3 -	Narrow down the area
Step 4-	Generate new idea
Step 5-	Developing ideas through discussion and finalize the topic/title
Step 6 -	Make objectives/Significance & motivation
Step 7 -	Statement of research problem

Write proposal



## Guidelines: Innovative practices

Relevance- Need for this research?

Will this research add to the state of knowledge? (*Publications!*)

What is the expected outcome? (*Product! Patents! Industrial application!*)

Quality- Planning, Scientific merit and Interdisciplinarity

How are you doing the research? (*Methodology!*)

- **Feasibility** Can you achieve the goals with your team and in time Can you achieve the goals with the requested resources? (*budget*)
  - Should have a phenomenal societal and economic impact and contribute to the expansion of scientific knowledge



## Identify your stakeholders

#### Government

- Regional, local
- Policy makers

#### Education

- Research institutions
- Higher education organisations

#### Industry

- Waste management
- Energy
- Urban planning and design

#### Civil society

- NGO
- General public

A good research problem should have the following characteristics:

- 1.It should address a **gap** in knowledge.
- 2.It should be significant enough to **contribute** to the existing body of research
  - 3.It should lead to **further research**
  - 4.It should be of interest to the researcher and suit his/her skills, time, and resources

    5. The approach towards solving the problem
  - 5. The approach towards solving the problem should be **ethical**



### To be followed by

- Prof. Priya R L (Technical paper writing)
- Prof. Lifna C S (Selection of conference/ journal)

Thank you for your patient listening



## **VES Institute of Technology**

## **Department of Computer Engineering**

Workshop on

**Fostering Innovation & Research** 

Writing a Quality Research Paper – by Mrs. Priya R. L

(15<sup>th</sup> March 2021)



## A Quality Paper Starts with Quality Plan





## **Need to write a Research / Technical Paper**



#### Ideally it is

- To communicate and share the new discoveries in Engineering or technology to improve the quality of life and for providing better human care.
- Make contributions to society

#### More often is

- to be advance in the field
- to get the research funding/grants
- to get the tenure
- to improve the scientific impact of institute / individual
- recognition by peers





## Is it a Skill to write Technical Papers?

- Many papers are badly written
- Good writing is a skill you can learn
- It's a skill that is worth learning:



- Your ideas will have more impact
- You will have better ideas





## Global View of Publication in Science & Engg.

Approximately 35,000 journals published regularly

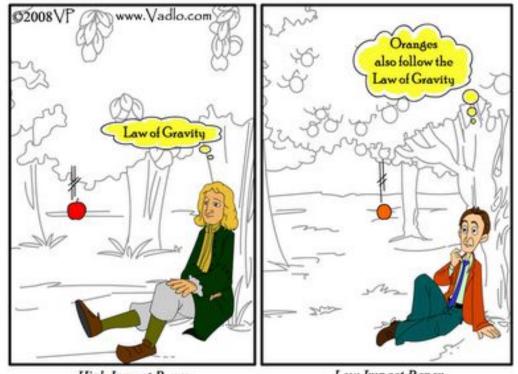
22,000 of them are SCI, Web of Science, UGC or Scopus abstracted

Total number of papers published annually exceeds 2.5 million

Over 50% are never cited by any one



#### Publishing in High Impact Journals-It's the idea which matters



High Impact Paper

Low Impact Paper



## From Good Research to Good Writing..

- Quality is state of mind
- Good science lead to great findings, and
- Great findings need to be reported in the best possible way to the world



## Paper writing is teaching...

It is useful to think that you are teaching your reader your idea

- What you did?
- Why it's important?
- How it works?

Well-written papers contribute more than just their described results

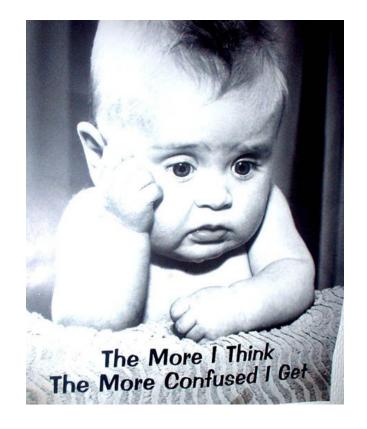
Readers understand the topic better



# Steps to Write a Technical / Research Paper

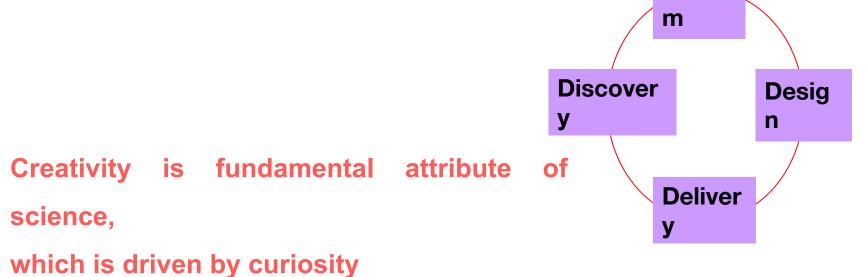


## Where do we Begin?





## Research Paradigm



Prof. Dr. M. Iqbal Choudhary, Dawn, Sunday December 6, 2009.

Drea



## Read or not to Read - Confusion!!

- Read, of course !!
- Know what's important
- Know what can be ignored without significant loss of information





## Why Read Papers?

- So you know what's happening
- Avoid reinventing the wheel
- does happen commonly,
- too many wheels already exists
- Find interesting research topics





## What to Read?

- Major conferences proceedings / Reputed Journals of recent years or a few years behind, but still can be useful
- Tech reports from active research groups
- Survey / overview papers
- White Papers
- more technical <u>IEEE transactions on computers</u>, ...
- newsletters ACM SIGCOMM, ACM SIGMOBILE, ...



## Read a Technical / Research Paper

- Read once or thrice Read write!
- Take notes as you read: Develop a system of underlining, marking, and/or paraphrasing in the margins that is meaningful to you.



## **Types of Technical Writings**

- Research Articles or Research Papers
- Review Articles
- Research Reports
- Research Projects for Funding
- Patents
- Dissertation of Thesis





## Types of Technical Writings: Research Articles

- Ultimate Product of Intellectual Pursuit
- Report on research findings that are
- Sound (Valid)
- Previously unknown (Novel and original)
- Add new understanding, observation, proofs
- It has required structure and style IMRaD (Introduction, Material, Results and Discussion).



## **Attributes of a Good Manuscript**

- Concise but powerful
- Story like
- To the point
- Free from grammatical and stylistic errors
- Recognizing contributions of others
- Technically correct



## **Remember: Four Questions of writing Manuscript**

- What is the?
   INTRODUCTION
- What did you do?

  METHODS
- What did you find?

  RESULTS
- What does that means? DISCUSSION



# The Writing Process..

1. Outline

2. Draft

3. Revise

4. Edit





# **Creating an Outline**

- Research: Perform initial research to learn about your chosen topic.
- Brainstorm: List all the ideas that you want to include in your paper.
- Organize: Group related ideas together.
- Order: Arrange material in subsections from general to specific or from abstract to concrete.
- Label: Create main and sub headings.



## **Choosing Your Topic...**



- Breadth. You may need to start broad and let your research take you narrower.
- Originality. Choose a topic that will allow you to contribute to the field, rather than just regurgitate facts.
- Sources. On the other hand, also choose a topic that has scholarly grounding.



## **Narrowing Your Topic..**

- Focus on a specific TYPE or CLASS
- Focus on a particular PLACE or REGION
- Focus on a certain TIME PERIOD
- Focus on a certain ASPECT
- Social, legal, medical, ethical, biological, psychological, economic, political, philosophical, etc.
- Focus on a specific POPULATION
- Gender, age, occupation, ethnicity, nationality, educational attainment, species, etc.
- Focus on a RELATIONSHIP with two or more topics
- COMBINE different kinds of focuses



## **Narrowing Your Topic – Brainstorming Strategies**

- List
- Map
- Free-write

- Tour the library.
- Locate sources.







# **Creating an Outline - Benefits**

- Aids in the process of writing
- Helps you organize your ideas
- Presents your material in a logical form
- Shows the relationships among ideas in your writing
- Constructs an ordered overview of your writing
- Defines boundaries and groups
- Prevents you from "straying" from the topic



# **Outline - Tips**

- Begin early! A strong, detailed outline is a crucial step of the writing process.
- Refer to your outline often. A strong outline provides a consistent backbone during the writing process.
- Be as specific as possible. This will be your guide throughout the entire writing process.



# **Outline - Tips**

- Avoid having too many subheadings. This may indicate that you can further narrow the topic of your paper.
- Don't be afraid to change your outline. Further research may provide additional information or counterpoints.
- Allow yourself enough time to make changes. Attempting a complete overhaul of your paper the night before it's due is both frustrating and often futile.



# **Draft**



- Begin to write in chunks of text defined by the parameters of each main point.
- Continuously refer to the thesis in order to stay on track. Use key terms from the thesis to thread each section together.
- Integrate information from sources as you draft, and include parenthetical citations.
- Move from point to point rather than from author to author



## What's in a Research Paper? – Basic Manuscript Outline

- Abstract
- Introduction
- Motivation
- Literature Survey / Review
- Proposed Idea & Methodologies
- Implementation Steps
- Result Analysis & Discussion
- Conclusions
- Future Work



## **Abstract**



- State paper objectives and scope
- Describe methods used
- Summarize results
- State principal conclusions



## **Abstract : Most Critical Part of a article / Manuscript**

- Should be informative, indicative and reflects the main 'story' of the article.
- The only chance you have to get the reader's attention.
- Should be crisp, concise and accurate.
- Gives the quick idea of the contents (Stand alone).
- What and how was done
- Provide a brief conclusions
- I generally write abstract at the end
- The detailed information must be present in the body text, not in abstract.





## Introduction

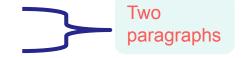


- Describe the author's contribution
- Clearly describe the nature and scope of the problem investigated.
- Review pertinent literature
- State your method of investigation and your justification



## The Introduction (1 Page)

- Describe the problem
  - What is the broader context?
  - What is the particular problem?



- Why is it interesting?
- State your contributions
  - What is new? (novelty)
  - Why is it useful? (features of your solution)
  - How do you know? (evaluation)
- Assume reader is general attendee of target conference





## **Materials and Methods**

- Experimental / Case Study Papers
- Purpose of experiments / case study
- Describe apparatus / experimental procedures
- Present data and observations
- Inferences



#### **Materials and Methods**

- Write the methods section first because it is the easiest to write.
- Provide enough details for competent researchers to repeat the experiment (Who, What, When, Where, How, and Why?)
- Start writing when experiments still in progress
- Sufficient information must be provided for reproducibility
- Study design-new methods must be described in detail
- Algorithms / Techniques / Design Strategy
- Statistical analysis and data collection
- Descriptive subheadings





## Results



- Use descriptive headings that concisely state the results.
- Data representation-concise and accurate.
- Short and easy to understand
- Consistent with the abstract and introduction
- Give tables and figures where needed
- With sufficient information so that minimum text is required.
- Don't repeat information in graphics and text.



## Results



- Appropriate numbering of figures and table mentioned in the text.
- Use significant figures where required.
- Avoid speculations and over discussion.
- Avoid using words such as proves, confirmed, removed all doubts, etc.
   Remember science is dynamic and ever changing.



## **Discussion**

- Hardest section to write, but it is also the most important.
- Use descriptive headings that concisely summarize the interpretation of the results.
- Answer the question posed in introduction
- Correlation of your finding with the existing knowledge
- Discrepancies between new results and previously reported results.



#### Conclusion



- Identify key findings and application
- Should not be a summary of the work done abstract is doing fine with that.
- Consistent with experimental and introduction



# References (IEEE / Springer Formats)

#### **Abstract:**

 Beharry, S.; Bragg, P.D. Properties of Bound Inorganic Phosphate on Bovine Mitochondrial F1F0-ATP Synthase. *J. Bioenerg. Biomembr.* 2021, 33, 35-42

#### **Book:**

• Beall, H.; Trimbur, J. A Short Guide to Writing about Chemistry, 2nd ed.; Longman: New York, 2021; pp 17-32



# References (IEEE / Springer Formats)

#### **Journals:**

Labaree, D.C.; Reynolds, T.Y.; Hochberg, R.B.
 Estradiol-16a-carboxylic Acid Esters as Locally Active
 Estrogens. J. Med. Chem. 2001, 44, 1802-1814.

#### **Encyclopedias:**

• Diagnostic Reagents. *Ullmann's Encyclopedia of Industrial Chemistry, 5th ed; VCH: Weinheim, Germany, 1985,* p. 196



# **Starting Your Paper**

#### Begin with the conclusions

- Describe how you got the results
- Describe the process and methodology
- Present the theory that explains the process
- Write simple Sentences
- Use Common Terminology





# **Revision Checklist**

- Reread the draft sheet.
- Underline your thesis.
- Read aloud.









## **Revision Checklist**



- Revise details; consider clarity and relevance.
- Check for cohesion.
- Check documentation format.
- Check grammar, punctuation, word choice, spelling.



## **Ethics**

- Plagiarism
- Duplicate manuscripts
- Unnecessary self citation
- Redundant publication
- Author conflicts of interest



"Welcome to the co-author's party!
You're number twenty-one!"



# **Plagiarism**





# Plagiarism Vs. Paraphrase

#### **Direct quote from research:**

 "Japan's beautiful Mount Fuji last erupted in 1707 and is now classified as dormant. Dormant volcanoes show no signs of activity, but they may erupt in the future."

#### Non-plagiarized paraphrase:

 Mount Fuji, the highest mountain in Japan, is actually a dormant volcano. Dormant means that it is not active. The last time Mount Fuji erupted was in 1707, and there is always the possibility of a future eruption.



# **Plagiarism Tools**

#### Paid / Licensed Plagiarism Tools

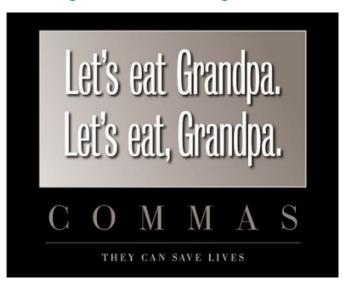
- Turnitin
- iThenticate
- URKUND

Open Source Plagiarism Tools - Link



#### Rules of Thumb about Grammatical Issues

 leaving out a single comma can change the meaning



If you didn't hyphenate it, it would be ambiguous







#### Use the active voice

The passive voice is "respectable" but it DEADENS your paper. Avoid it at all costs.

you and the reader NO YES It can be seen that... We can see that... 34 tests were run We ran 34 tests These properties were We wanted to retain these thought desirable properties "We" = the It might be thought that this You might think this would authors would be a type error be a type error

"We" =

"You" = the reader

Seminar on Research Paper Writing – Research Forum, Department of Computer Engg. VESIT



# **Use Simple & Direct Language**

NO	YES
The object under study was displaced horizontally	The ball moved sideways
On an annual basis	Yearly
Endeavour to ascertain	Find out
It could be considered that the speed of storage reclamation left something to be desired	The garbage collector was really slow

Seminar on Research Paper Writing – Research Forum, Department of Computer Engg. VESIT











## **VES Institute of Technology**

## **Department of Computer Engineering**

# Workshop on Fostering Innovation & Research

Guidelines towards Publishing Papers in reputed Conferences / Journals

Mrs. Lifna C S

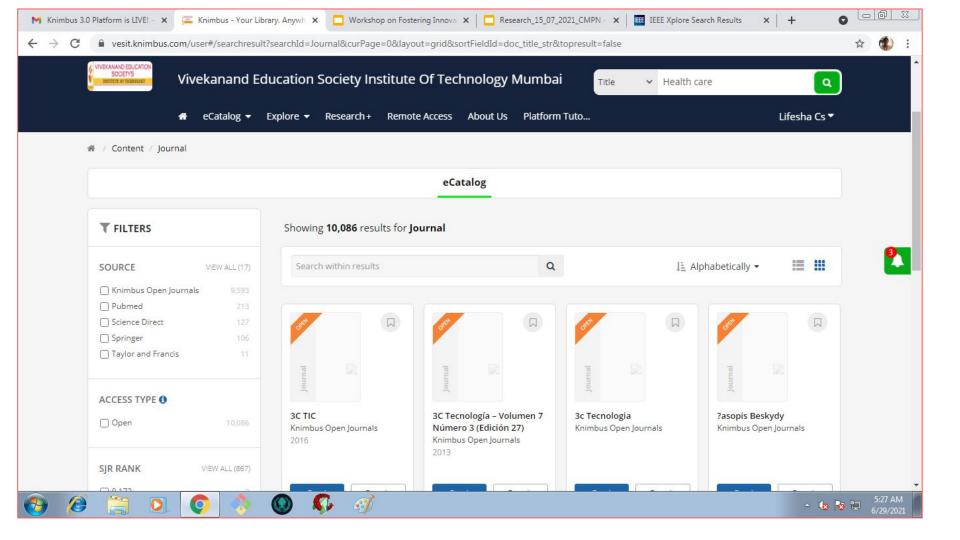
(15th July 2021)

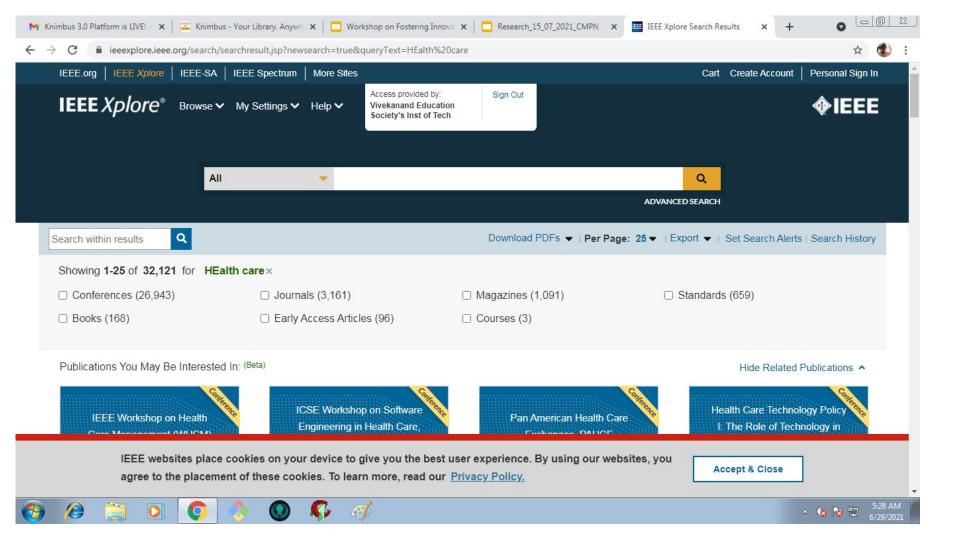


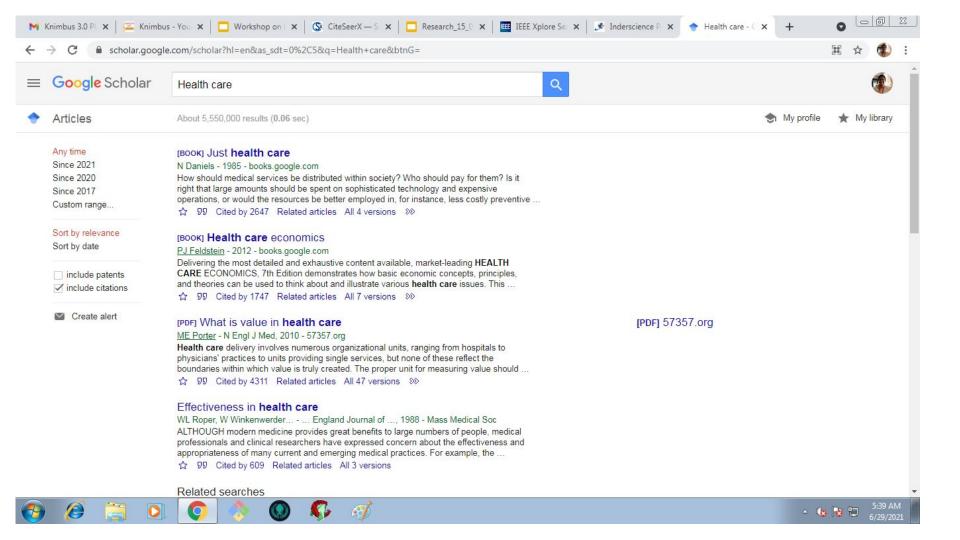


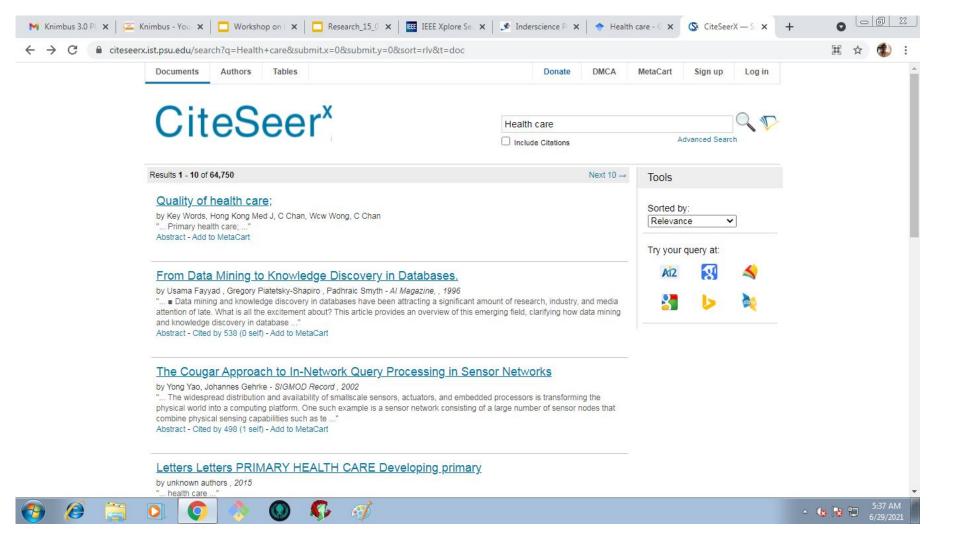


- Knimbus <a href="https://vesit.knimbus.com/user#/home">https://vesit.knimbus.com/user#/home</a>
  - Springer
  - ScienceDirect
  - Taylor & Francis
  - Open Journals
- IEEExplore
- Google Scholar
- CiteSeerX







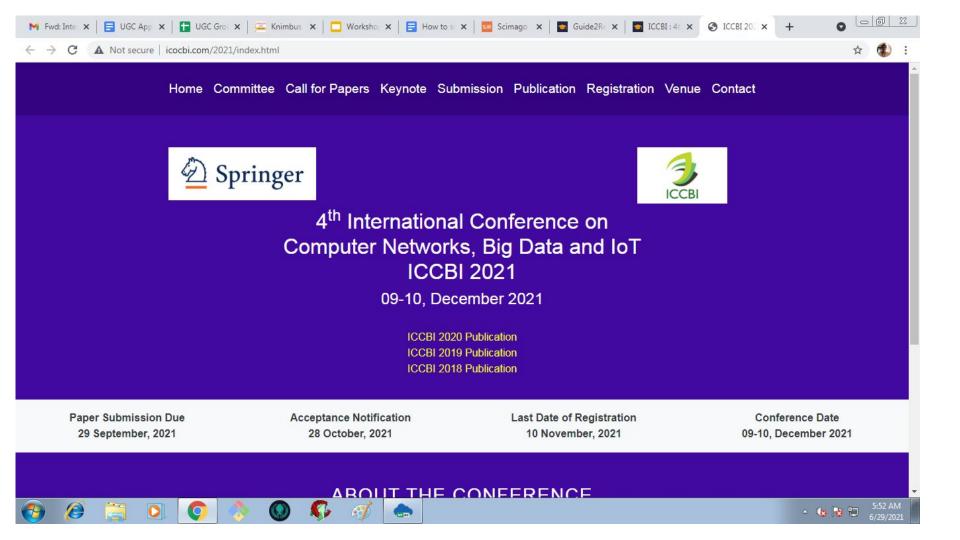




#### Where to Publish Papers?



- Conferences
  - https://www.ieee.org/conferences/
  - https://ocs.springer.com/misc/viewconferences
  - https://easychair.org/cfp/country.cgi?cc=in
  - https://www.guide2research.com/ (Springer / IEEE / Elsevier)
  - Example : <a href="http://icocbi.com/2021/index.html">http://icocbi.com/2021/index.html</a>

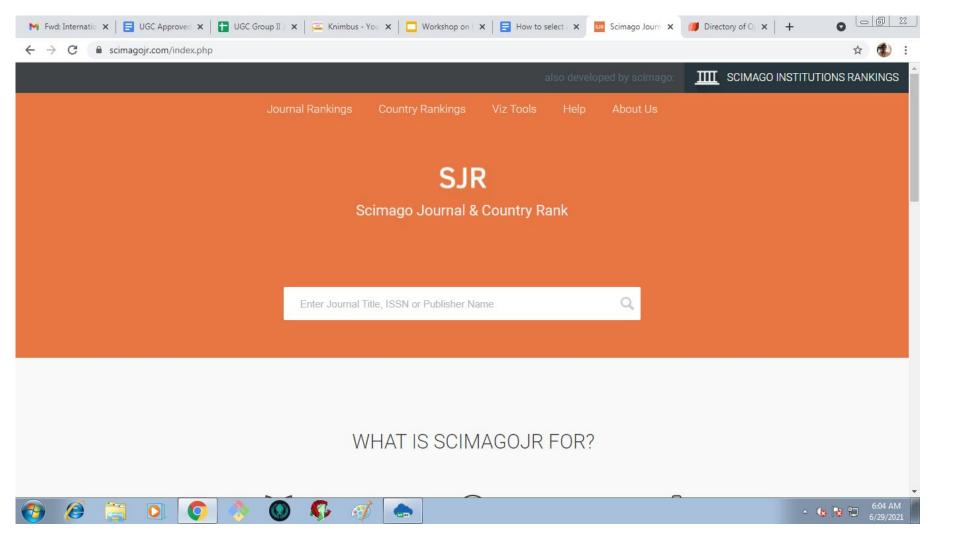


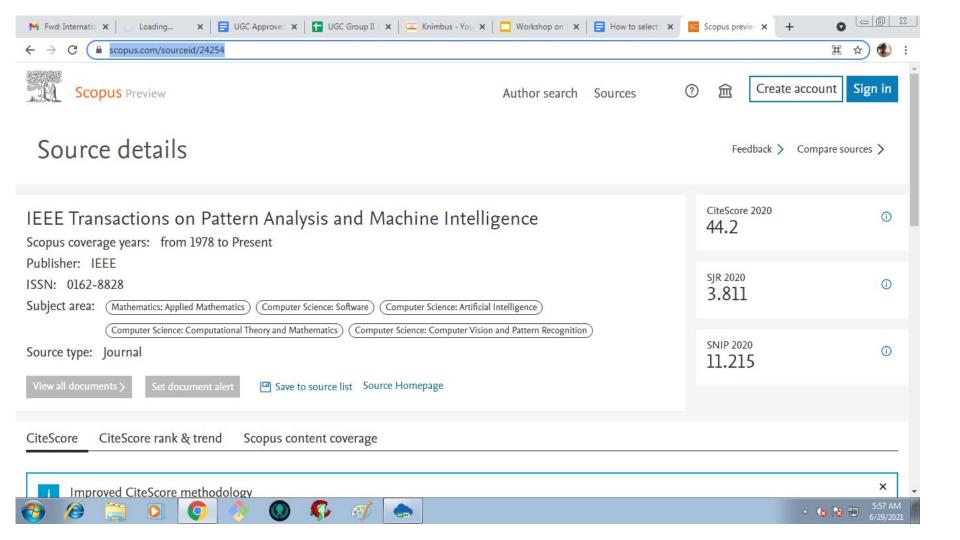


#### Where to Publish Papers?



- Journals -
  - Reputed Journals Springer / IEEE / ScienceDirect
    - https://www.scimagojr.com/journalrank.php
    - Eg: https://www.scopus.com/sourceid/24254
  - Fake Journals
    - Eg: <a href="https://www.ijsdr.org/">https://www.ijsdr.org/</a>
  - Inderscience Journals Peer Review Journals
  - Open Access Journals
  - Call for Journals via Mails
- Call for Book Chapters via Mails



















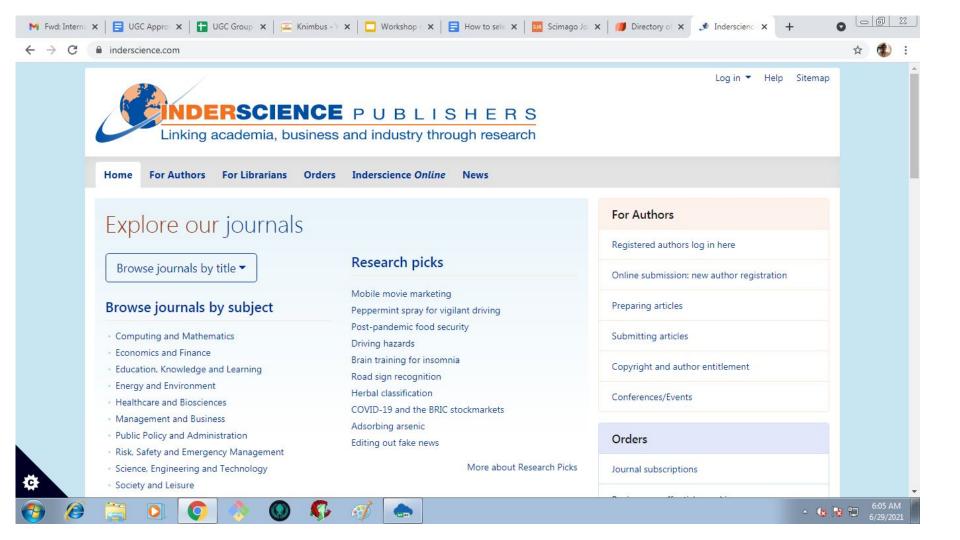


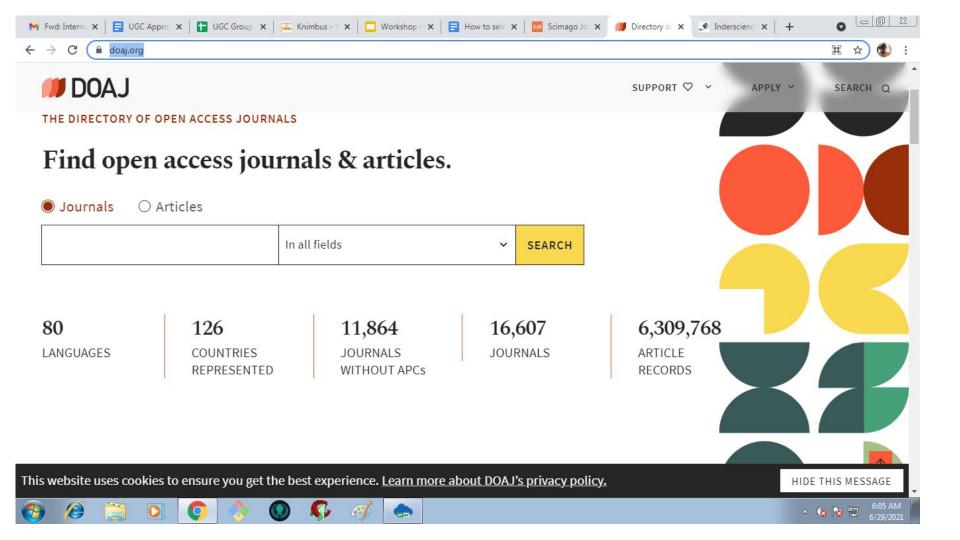


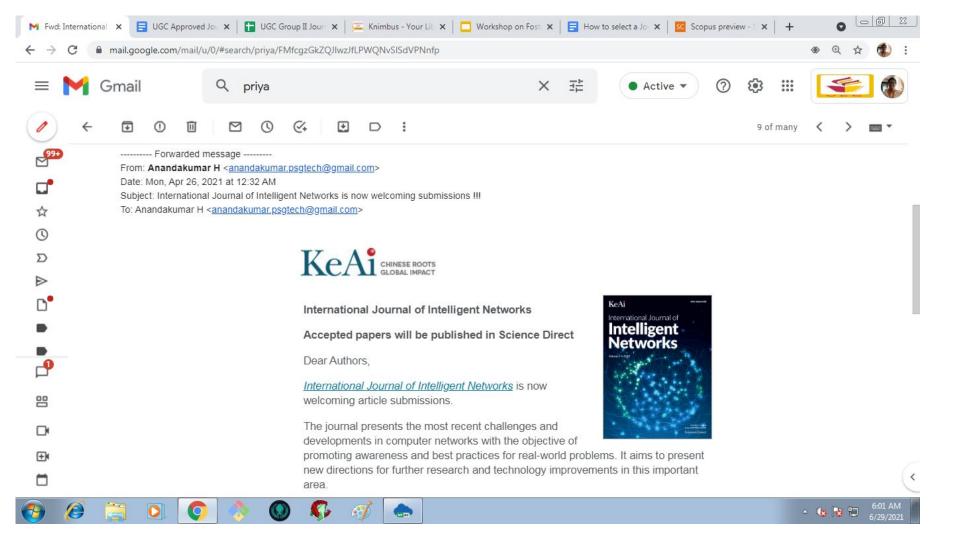


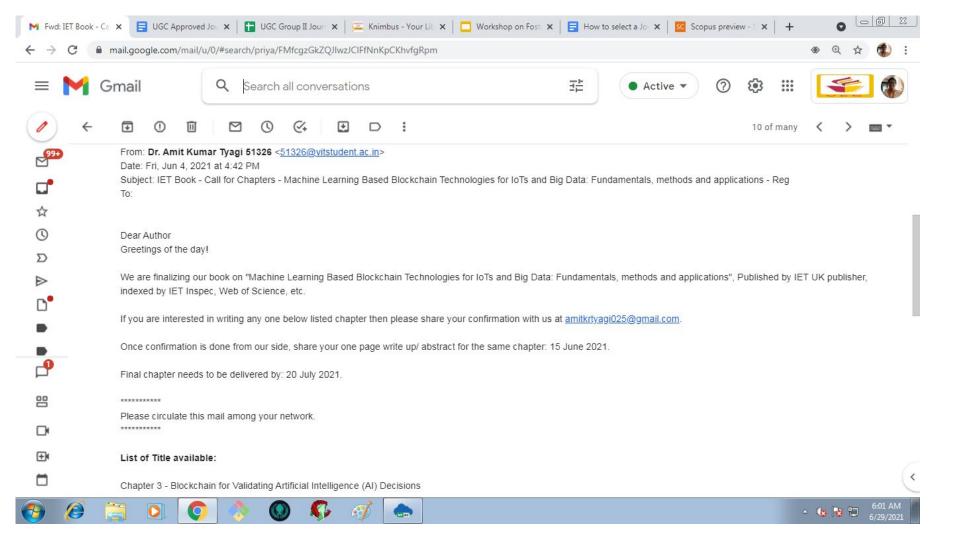














## **How to Search for Reputed Journals?**



- 1. UGC approved Journals
- 2. Web of Science WoS Journals
- 3. Scopus Indexed journals.



#### How to Publish a Research Paper in International Journal



#### Further Reading:

- https://library.stonybrook.edu/scholarly-communication/know-journal-legitimate/
- https://www.ilovephd.com/how-to-identify-fake-journals/



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