# Keys to Research Productivity

**Expert Lecture –**

**Nalla Malla Reddy Engineering College (NMREC),** Hyderabad, India,

07 Jan 2023

Saraju P. Mohanty

University of North Texas, USA.

**Email: saraju.mohanty@unt.edu  Website: http://www.smohanty.org**

**Keys to Productivity - Prof./Dr. Saraju Mohanty**
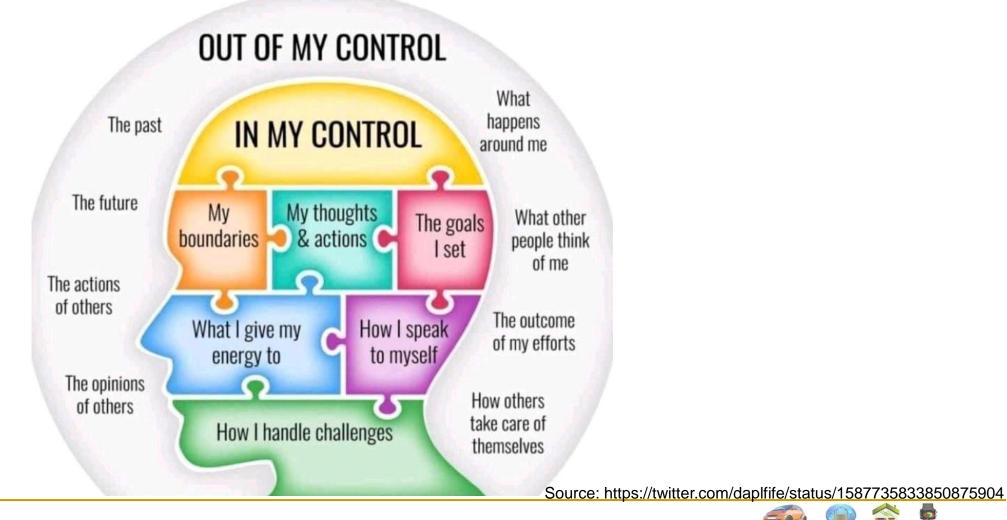
Smart Electronic Systems Laboratory (SESL)

# Outline

- What we can control

- Academia as a Career

- Best Practices in Publishing

- Rules of Writing a Research Paper

- Rule for Productivity

Keys to Productivity - Prof./Dr. Saraju Mohanty

# What We Can't Control? – Lots of Things

# There are Lots of Things Around us that we Can't Control



OUT OF MY CONTROL

IN MY CONTROL

The past

The future

The actions of others

The opinions of others

What happens around me

What other people think of me

The outcome of my efforts

How others take care of themselves

My boundaries

My thoughts & actions

The goals I set

What I give my energy to

How I speak to myself

How I handle challenges

Source: https://twitter.com/daplfife/status/1587735833850875904

Keys to Productivity - Prof./Dr. Saraju Mohanty

Smart Electronic Systems Laboratory (SESL)

UNT EST. 1890 DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING College of Engineering

# We Can't Control the Phases of Life?

1) Brahmacharya (Student Life)

2) Grihastha (Household Life)

3) Vanaprastha (Retired Life)

4) Sannyasa (Renounced Life)

Keys to Productivity - Prof./Dr. Saraju Mohanty

# Can We Control the Phases of Academic Life?

1) Shishya (Learner)

2) Karta (Doer)

3) Daata (Giver)

4) Bodhi (Enlightened)

# Academia –
# Is it a Good Career Choice?

**Keys to Productivity - Prof./Dr. Saraju Mohanty**

# Academia as a Career

- Academia is more than a career choice.

- It is a lifestyle.

- It follows you home and it's by no stretch of imagination a typical 8-to-5 job.

- One may not be allowed into the system (in the case of tenure-track professorships).

Source: https://www.quora.com/Why-is-a-career-in-academia-such-a-terrible-path-to-choose-now

Keys to Productivity - Prof./Dr. Saraju Mohanty

Smart Electronic Systems Laboratory (SESL)

# Academia as a Career

- There is an oversupply of Ph.D. holders. There are very few openings per year in some fields than the number of Ph.D. holder.

- You won't have a big paycheck. Working for a company will yield the greatest economic benefits.

- There is significant pressure to publish. A non-academic won't know the type of pressure this translates into.

- Grant money is the golden standard for many disciplines and applying is unbelievably time-consuming. Many academics spend more time applying for grant money than doing research.

Source: https://www.quora.com/Why-is-a-career-in-academia-such-a-terrible-path-to-choose-now

*Keys to Productivity - Prof./Dr. Saraju Mohanty*

**Smart Electronic Systems Laboratory (SESL)**

UNT EST. 1890 DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING College of Engineering

# Academia as a Career

- The positive things clearly outweigh the negative ones.

- More freedom, time to travel, time to spend with activities of interest.,

- Intellectual stimulation than most if not all non-academics.

- Travel often to interesting places and have wonderful conversations with people who are at the cutting edge of the science.

- Working with a set of students who challenge and approach for help.

Source: https://www.quora.com/Why-is-a-career-in-academia-such-a-terrible-path-to-choose-now

**Keys to Productivity - Prof./Dr. Saraju Mohanty**

Smart Electronic Systems
Laboratory (SESL)

UNT
DEPARTMENT OF COMPUTER
SCIENCE & ENGINEERING
College of Engineering
EST. 1890

# Academic Life – 3 Main Tasks

- Teaching

- Research

- Services

Keys to Productivity - Prof./Dr. Saraju Mohanty

# Academic Life – Teaching

- Class room formal lectures
- Graduate and Undergraduate student mentoring

Keys to Productivity - Prof./Dr. Saraju Mohanty

# Academic Life – Research

- Publishing

- Project Proposal and Execution

- Patenting

Keys to Productivity - Prof./Dr. Saraju Mohanty

Smart Electronic Systems
Laboratory (SESL)

UNT
EST. 1890
DEPARTMENT OF COMPUTER
SCIENCE & ENGINEERING
College of Engineering

# Academic Life – Service

- Institutional Service
- Professional Service

Keys to Productivity - Prof./Dr. Saraju Mohanty

# Academic Life – Task Allocations

Important is to maintain or have a TRS% as to suit one's career objectives and stage of career.

Keys to Productivity - Prof./Dr. Saraju Mohanty

Smart Electronic Systems Laboratory (SESL)

# Research Publishing – Best Practices

# Why is it Important to Patent My Research Idea?

- Patent Provides Exclusive Right

- Patent Provides Competitive Advantage

- Technology Transfer

- Potentials for Financial Returns

- Increase Valuation

- Attract Investment

- Helps to Obtain Funding

- Satisfaction to see Lab Research → Mass Product

Source: https://henrygoh.com/top-10-reasons-why-a-patent-is-important/

Keys to Productivity - Prof./Dr. Saraju Mohanty

Smart Electronic Systems Laboratory (SESL)

# What is the Right Time to File the Patent?

- Before Publishing the research

  OR

- After Publishing the research

Keys to Productivity - Prof./Dr. Saraju Mohanty

# Rules to Balance Patents and Publications

- File a patent before you present or publish your work in the public domain to be fully careful.

- Be careful while presenting your idea or writing an abstract.

- Avoid providing too many details that can enable a 3rd party to copy your invention.

- Present only broadly outline your ideas while discussing with potential organizations or companies.

- If you intend to have business discussions with a 3rd party, ensure that a none-disclosure agreement (NDA) is in place prior to the discussions.

Source: https://www.enago.com/academy/publish-or-patent-first

Keys to Productivity - Prof./Dr. Saraju Mohanty

Smart Electronic Systems Laboratory (SESL)

# Publishing Venue – Where to Publish?

- Magazine, Transactions, Letters, or Conference Proceedings?

- Depends on the content of a manuscript.

- First fix a venue → Write? OR First Write → venue?

- Magazine Article – Broad scope

- Journal/Transactions Papers – Focused scope and concrete results

- Letters Papers – Focused scope and brief results

- Conference Proceedings Papers – Focused scope and quick dissemination to receive direct feedback from peers

Keys to Productivity - Prof./Dr. Saraju Mohanty

# Publishing Venue – Magazine?

- Articles should be broadly scoped.

- Technical articles may be suitable, but these should be of general interest to an engineering audience and of broader scope than archival technical papers or conference proceedings papers.

- Articles related to the background story behind engineering standards or practical experiences in product specification and design of mainstream systems.

- Tutorials on related technologies or techniques are also strongly encouraged.

Keys to Productivity - Prof./Dr. Saraju Mohanty

# Publishing Venue – Journal/Transactions?

- Journal/Transactions are archival venues, just not intended for quick dissemination of research.

- Articles should have both depth and breadth.

- The work should have strong novelty. It must advance the state-of-the-art the to be published.

- The work should stand for decades without being outdated.

- The experimental results need to be rigorous.

- Manuscript need to survive multiple iterations of review process.

- Long Review Cycles. So authors should pay attention to every minor details. It may get one more round of revision just for a minor issue.

Keys to Productivity - Prof./Dr. Saraju Mohanty

Smart Electronic Systems Laboratory (SESL)

UNT DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING College of Engineering EST. 1890

# Publishing Venue – Conference Proceedings?

- Conference Publishing may be for quick dissemination.

- Conference Presentations facilitates direct interaction with peers.

- Conference attendance may help researchers in their career advancement.

- Conference reviews can help to improve the work further which may then eventually become a journal publishing.

- Work-in-Progress (WIP) and Research-Session-Demo (RDS) are alternative modes of dissemination to get feedback on ongoing research from the peers.

Keys to Productivity - Prof./Dr. Saraju Mohanty

# Conference → Journal OR Journal → Conference?

- Conference publishing first → corresponding journal

  OR

  Journal publishing first → corresponding conference

- To my experience: I see that most of the researchers follow the first option and few researchers follow the second option.

- In either case one shouldn't have the same text and figures.

  - These are two distinct publications for the authors.

  - After acceptance both the journal paper and conference paper appear in digital library, a similarity software will flag the similarity.

Keys to Productivity - Prof./Dr. Saraju Mohanty

# Shall I Target Journal/Transactions Submission Directly Without a Conference Paper of the Work?

- Short Answer: No

- Reviews received from the Initial Conference Version of the work can strengthen the work to become a journal paper eventually.

- Reviewers of the journal manuscript can have better impression if they find that it is already based on a quality conference paper.

- Journal have longer review cycle which may not correctly timestamp the idea published in the journal paper. Imagine rejection of the journal manuscript after 6-8 months of review cycle, loosing the time.

Smart Electronic Systems Laboratory (SESL)

# Conference → Journal: How to Do it?

- Publisher need anywhere between 30%-70% additional materials over the conference version for a journal article.

- Final judgement is typically up to the Editor-in-Chief (EiC) of specific journal/transactions.

- Key aspects of extending a conference paper to a journal article: additional novel contributions, thorough literature analysis, more experimental results, additional figures, and additional Tables.

- Complete rewriting of the text and redrawing of any figures used is a good idea to avoid similarity issues and the copyright aspects as in many cases the publishers conference proceedings and the journal/transactions may not the same.

- Remember to cite the conference paper on the current journal paper; may be even write in the acknowledgement.

Smart Electronic Systems Laboratory (SESL)

UNT DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING College of Engineering EST. 1890

# Journal → Conference: How to Do it?

- It is not common to present a journal published paper as a a conference paper.

- Things are changing – Too many conference looking for audience

- Short conference paper as possible option

- Research Demo Session (RDS) papers is another option

- Complete rewriting of the text and redrawing of any figures used is a good idea to avoid similarity issues and the copyright aspects as in many cases the publishers of conference proceedings and the journal/transactions may be different.

- Remember to cite the journal paper on the current conference paper; may be even write in the acknowledgement.

Smart Electronic Systems Laboratory (SESL)

UNT EST. 1890 DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING College of Engineering

# Is it Important to Suggest Reviewers Names when Submitting a Journal/Transactions Manuscript?

- **Short Answer:** Yes

- Associate Editors are typically overloaded, they may pick few of the reviewers from your suggested list.

- The manuscript may be handled by an AE who is working on a closely, but no exactly on the area of the manuscript, so may take time to find sufficient reviewers.

- You never know your preferred reviewer may see your work favorably!

# How Important is Open-Access Publishing?

- **Thoughts on the current state of academic publishing**
  - Journal papers are important OR Conference papers
  - Open Access is better OR traditional closed access
- **Thoughts on Open-Access:**
  - Arxiv (https://arxiv.org/), TechRxiv (https://www.techrxiv.org/)
  - Data Regulation – Quality Data is key
- **One aspect of academic publishing that is very important/significant these days**
  - Open Access and Research Reproducibility

Smart Electronic Systems
Laboratory (SESL)

# Journal Review Process Takes Long Time, Should I Only Publish in Conference?

- **Short Answer – No**

- Journals are archival purposes and publish thoroughly reviewed works. So quality of work can improve if reviews are good.

- Option to time stamp the idea, before submitting to Journal:
  - ❏ Make a conference paper
  - ❏ Put it in open access depository like arXiv, TechRxiv, etc.

Keys to Productivity - Prof./Dr. Saraju Mohanty

**Smart Electronic Systems Laboratory (SESL)**
UNT EST. 1890 DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING College of Engineering

# Journal Review Process Takes Long Time, Should I Submit to Multiple Venues for Faster Publishing?

- Short Answer: No

- Submitting same manuscript to multiple journals/transactions at a time is not allowed.

- Submitting same manuscript to a journals/transactions and a conference at a time is not allowed.

- Danger of being rejected without review from multiple venues.

*Keys to Productivity - Prof./Dr. Saraju Mohanty*

# I Can Publish in Journals, Why Should I Bother for Conferences?

- Short Answer – Yes

- Networking with Global Peers

- Direct Interaction with Peers → Boost Researcher's Confidence

- Meet people who can help in job search

- Meet people who can your reference for job search

- Meet people who can be reviewer of your next papers

- Meet people who can be external examiner of thesis/dissertation (if applicable)

Keys to Productivity - Prof./Dr. Saraju Mohanty

Smart Electronic Systems Laboratory (SESL)

# Does the Look and Formatting of the Manuscript Matter during Submission?

- **Short Answer:** Yes

- **Note:** First Impression Lasts Long

- Reviewer maynot be interested to read details if the manuscript doesn't look professional and clear.

- Look and legibility are important to attract attention.

- Danger of the manuscript being returned without review.

Smart Electronic Systems
Laboratory (SESL)

# How important is author ordering in a publication?

- Short Answer: No definite answer

- In some disciplines the faculty mentor is typically the last author.

- In some cases, the primary contributor is the first author and other is made based on level of contributions to the work.

Keys to Productivity - Prof./Dr. Saraju Mohanty

# How Important is Social Media for Researchers?

- **Short Answer:** Not Much

- How important is social media for researchers? Should Ph.D. students invest time in building profiles & networks social media?
  - ❑ Neutral – Publicity + Typical Negativity of social media (Privacy issues)

- How challenging do you feel it is for new Ph.D. researchers to get published? Any advice/tips?
  - ❑ Reasonable challenging for new researchers, Conference → Journals

Smart Electronic Systems
Laboratory (SESL)

UNT
EST. 1890

# Why Should I Spend Time as a Reviewer?

- Short Answer - Yes

- Early Learning: Researchers who are engaged in cutting-edge research can't find learning materials from the text books. By the time a research findings appear in text book, they are outdated. A researcher can stay up to date and learn from other researcher if he/she reviews their manuscripts.

- Learning Quality expected in a specific journal/conference. Accordingly, one can use that experience to improve own manuscripts before submissions.

- Service to the profession and community.

Smart Electronic Systems
Laboratory (SESL)

# What are the Best Practices of Publishing?

■ Short Answer: No definite answer

■ Differs in one area of research to another area of research, from disciplines to another, and from publisher to another publisher. Some rule of thumb:

  ❑ Publish one idea in one venue

  ❑ Do best job for all text including references

  ❑ Give credit to existing literature

  ❑ Read articles/papers from a target venue before preparing own manuscript

  ❑ Pay attention to each minor or major aspects; too many small → rejection

  ❑ Learn to handle rejection

Smart Electronic Systems
Laboratory (SESL)
UNT DEPARTMENT OF COMPUTER
SCIENCE & ENGINEERING
EST. 1890 College of Engineering

# A Big Qeuestion – Where to Publish?

- As an author after I have always asked myself:

  - First Option: My article is an excellent scholarly product because it got published what my peers think as a selective or top avenue.

    OR

  - Second Option: My article is an excellent scholarly product because it is read and/or cited by my peers and it makes the avenue great wherever it is published.

- Most of the researchers have a tendency to choose the first option from the above.

- However, I strongly believe that if an article has real strength then it should be second option.

Keys to Productivity - Prof./Dr. Saraju Mohanty

Smart Electronic Systems
Laboratory (SESL)

# Golden Rules of Writing a Research Paper

# Typical Structure  - Various Section

- Abstract

- Introduction

- Novel Contributions

- Related Prior Works

- Innovative Sections – Few of them to sale the paper

- Experimental Results

- Conclusions

- Future Directions

Keys to Productivity - Prof./Dr. Saraju Mohanty

# Abstract

- Brief overview of the overall work.

- Very important to sell the paper as gives first impression to the reviewers.

# Introduction Section

- Must sell the research work in this Section.

- 2 to 3 paragraph big picture, social impact, motivation, etc. in a top-down fashion.

- Last Paragraph should mention paper organization.

Keys to Productivity - Prof./Dr. Saraju Mohanty

# Novel Contributions Section

- 3 Subsections

- What is the Problem Addressed? What is the Significance of the Problem? What Research Questions have been Addressed? What are the Challenges?

- What is the Solution Proposed? What are the Hypotheses?

- What is the Novelty and Significance of the Proposed Solution?

*Keys to Productivity - Prof./Dr. Saraju Mohanty*

**Smart Electronic Systems Laboratory (SESL)**

UNT
DEPARTMENT OF COMPUTER
SCIENCE & ENGINEERING
College of Engineering
EST. 1890

# Related Prior Works Section

- Important Section

- What other researchers have done in this domain?

- What others have done to address the specific problem if the problem addressed is not new? Nothing wrong if multiple solutions of a old and relevant problem.

- Must present Table and/or Taxonomy to present the comparative perspectives to convince the reviewers and to improve readability.

Keys to Productivity - Prof./Dr. Saraju Mohanty

**Smart Electronic Systems Laboratory (SESL)**

# Innovative Contributing Sections

- Good to present 2 – 3 Sections
- Follow Top-Down style to present the idea and contributions

Keys to Productivity - Prof./Dr. Saraju Mohanty

# Experimental Results Section

- Experimental Setup

- Datasets

- Results Analysis

- Direct Comparison if same problem is solved by others.

- Comparative Perspective if the problem is not handled before.

Keys to Productivity - Prof./Dr. Saraju Mohanty

# Conclusion Section

- This is **not** repeat of the abstract.

- Discuss what has been learnt in the process of this research execution and experimentation.

Keys to Productivity - Prof./Dr. Saraju Mohanty

# Future Directions Section

- Some pointer if someone wants to carry forward this research.

- Gives a good impression to the reviewer and reader that you a clear vision of the research that is being undertaken.

# Rules of Productivity

Keys to Productivity - Prof./Dr. Saraju Mohanty

# Rules of Productivity – 1 - Avoid Large Meetings

- Large meetings waste valuable time and energy.

- They discourage debate

- People are more guarded than open

- There's not enough time for everyone to contribute

- Don't schedule large meetings unless you're certain they provide value to everyone.

**Keys to Productivity - Prof./Dr. Saraju Mohanty**

# Rules of Productivity – 2 - Leave a Meeting if You are Not Contributing

- If a meeting doesn't require your Input or Value Your Recommendations/Decisions → Your presence is useless

- It's not rude to leave a meeting. But it's rude to waste people's time.

Keys to Productivity - Prof./Dr. Saraju Mohanty

# Rules of Productivity – 3 - Forget the Chain of Command

- Communicate with colleagues directly.

- Not through supervisors or managers.

- Fast communicators make fast decisions.

- Fast decisions → competitive advantage.

# Rules of Productivity – 4 - Be Clear, not Clever

- Avoid nonsense words and technical jargon.

- It slows down communication.

- Choose words that are:
  - Concise
  - To the point
  - Easy to understand

- Don't sound smart. Be efficient.

**Smart Electronic Systems Laboratory (SESL)**

Keys to Productivity - Prof./Dr. Saraju Mohanty

# Rules of Productivity - 5 - Ditch Frequent Meetings

- There's no better way to waste everyone's time.

- Use meetings to: 1) Collaborate, 2) Attack issues head-on, 3) Solve urgent problems

- But once you resolve the issue, frequent meetings are no longer necessary.

- You can resolve most issues without a meeting.

- Instead of meetings: 1) Send a text, 2) Send an email, 3) Communicate on a discord or slack channel

- Don't interrupt your team's workflow if it's unnecessary.

Keys to Productivity - Prof./Dr. Saraju Mohanty

Smart Electronic Systems Laboratory (SESL)

# Golden Rules of Productivity – 6 - Use Common Sense

- If a company rule doesn't: - Make sense - Contribute to progress - Apply to your specific situation
- Avoid following the rule with your eyes closed.

Keys to Productivity - Prof./Dr. Saraju Mohanty

**Smart Electronic Systems Laboratory (SESL)**

# Summary and Conclusion

- Listen to Yourself.

- Maintain a balance between patent, journal papers, and conference papers.

- Be your own example instead of following other. Everyone is different and unique, and have distinct constraints.

- Research is not about Publishing or Funding. It is about solving problems.

- Don't do just same things at different phases (e.g. Assistant, Associate or Full Professor) of career.

- Expectation should be different at different phases of career.

- Don't follow rules. Follow principles.