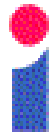
Publishing Research Results in Informatics and Computer Science

Alan Bundy

School of informatics

University of Edinburgh

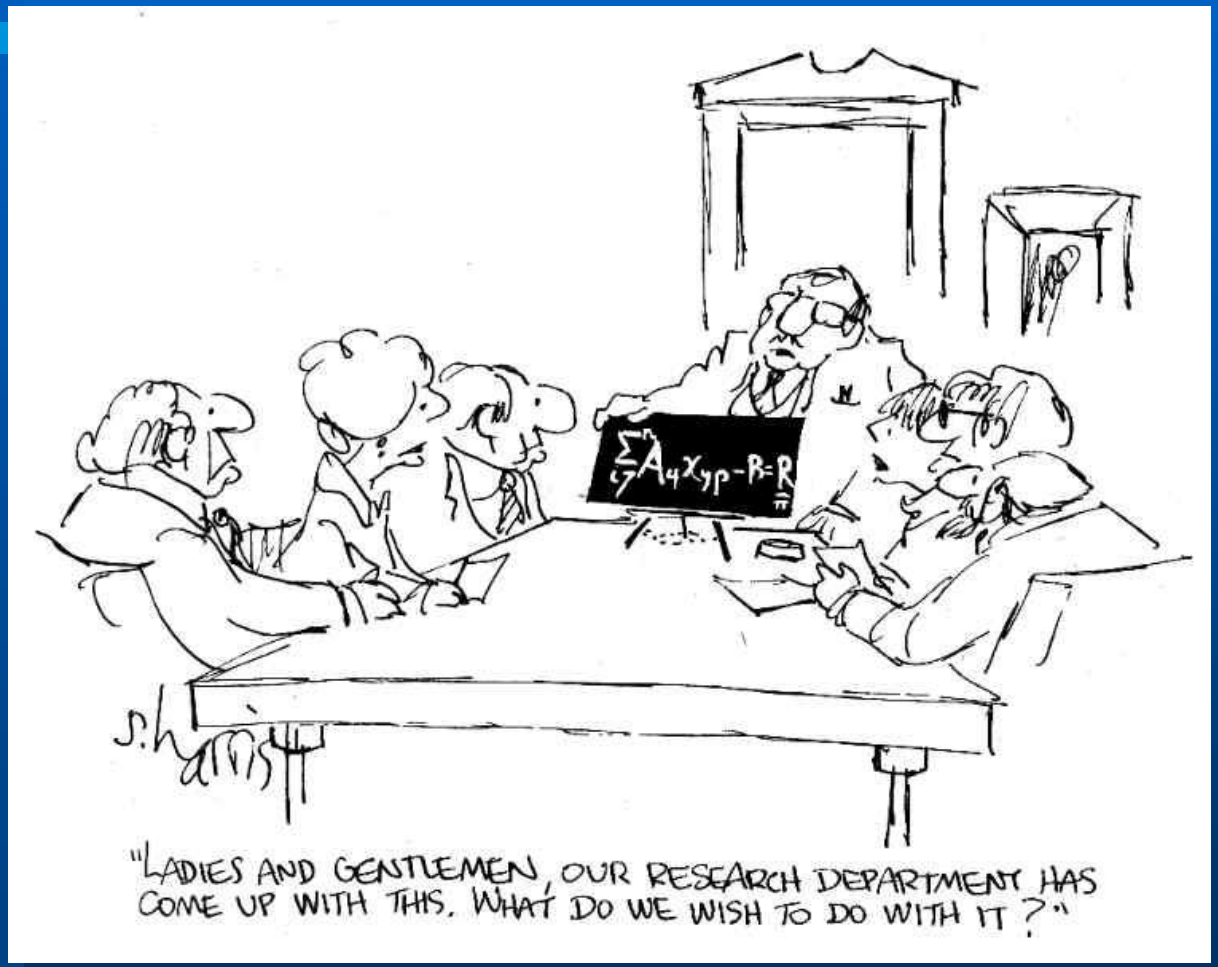
SICSA PhD Conference 2015



Roadmap

- Publishing research.
- Sorting out your ideas.
- The structure of publications.
- The writing process.
- The refereeing process.
- Exercises.

Publishing Research



Why Write Papers

- To disseminate your research achievements.
- To attract feedback on your research.
- To promote your career.
  - Appointments & promotions depend on a healthy publication record.
  - REF prefers four 4* papers to forty 1*.

Types of Publication 1

- **Internal notes and working papers.**
  - **For personal record, research development and internal dissemination.**
- **Workshop papers.**
  - **For work in progress & to promote discussion.**
- **Conference papers.**
  - **For nearly complete work & dissemination.**

Types of Publication 2

- **Journal papers and book chapters.**
  - **Archival record and dissemination.**
  - **Electronic or hardcopy.**
- **Books: monographs and textbooks.**
  - **Archival record of programme of work.**
- **Theses.**
  - **To gain PhD.**

Sorting Out Your Ideas

Things to Think About

- What are your aims and objectives?
- What is your motivation?
- What is the related work?
- What is your novel idea?
- What is your claim or hypothesis?
- What is your evidence?
- At what stage is your project?

Hypotheses and Evidence

- **All science and engineering advances consist of hypothesis + evidence.**
- **Typical Informatics hypothesis (or claim):**

  System/technique/parameter X is better at task Y than each of its competitors Z along some dimension W.
- **Typical evidence:**
  - **Experimental (from running system);**
  - **Experimental (from human/animal observation);**
  - **Theoretical (from proof or reasoned argument).**

Importance of Hypotheses

- Many possible hypotheses.
- Ambiguity is major cause of referee/reader misunderstanding.
- Vagueness is major cause of poor methodology:
  - Missing or inconclusive evidence;
  - Unfocussed research direction.

Exercise

What hypothesis will you evaluate in your project?

Structure of Informatics Publications

- Introduction
- Literature survey
- Background
- Novel Contribution
- Related work
- Further work
- Conclusion
- References
- Appendices

Novel Contribution

- **System Description:**
  - Specification, implementation and evaluation of system.
- **Theoretical Paper:**
  - Definitions, theorems and proofs.
- **Computational Modelling:**
  - Computer model, experimental design and experimental results.

Writing and Submitting Papers

"I try to write a little bit every day."

The Submission Process

- Choose a journal or conference.
  - Note publishers instructions.
- Prepare the manuscript.
  - To meet publishers instructions.
- Submit Manuscript.
  - By deadline, if conference or special issue.
- Receive referees' reports.
  - Make corrections and resubmit, maybe recurse.
- Receive galley proofs
  - Rare now, except books.
  - Answer printer's questions, check proof.

Choosing a Publication

- **Journals/conferences vary in quality.**
  - **Always choose highest quality outlet that your work will merit.**
  - **Can check status via ISI/Citeseer impact factor.**
  - **Some conferences rated higher than most related journals.**
- **Type of outlet depends on state of work:**
  - **in progress, complete, etc.**
- **Always aim for eventual journal publication.**
  - **Use workshops & conferences as stepping stones.**

Publisher's Instructions

- **Read the submission instructions carefully.**
  - **See call for papers, publishers web page or journal inside cover.**
- **You will be expected to follow the publisher's house-style.**
  - **Layout, punctuation, spelling, etc.**
  - **Sometimes there is a Latex style file.**

Preparing a Manuscript

- Write a first draft.
- Read it through and make corrections.
- Ask some colleagues to read it.
  - Never ask a colleague to read a draft you are not happy with.
  - Never ask someone to re-read a draft you have not corrected.
  - If you are a non-native writer, ask a native writer to check grammar and style.
  - Don’t pass your boss a rough draft.
  - If someone misunderstands then you need to reword.

Writing the First Draft

- **Write as you go.**
  - **Especially the literature survey.**
  - **Write short notes on each phase of your research.**
- **Start in the middle,**
  - **with the novel contributions material.**
  - **Work backwards to the beginning,**
  - **and forwards to the end.**
- **Don't get too attached to your draft.**
  - **You will have to make far more revisions than you imagined.**

Writing Style

- Simple is always best.
  - Make points as succinctly as possible.
  - Use short sentences.
  - Use graphics whenever you can.
  - Strive for the clearest notation.
- Annotate figures with explanations.
- Define all technical terms.
  - And use them consistently.
- Keep to one point per paragraph.
  - Start with a topic sentence.

Reviewing Manuscript

- Use a spelling corrector.
- Use a grammar corrector.
- Use change bars.
- Re-read after a break.
- Skim for rhythm:
  - Spot overlong and awkward constructions;
  - Break-up long sentences;
  - Reorder clauses/phrases.
- Make sure material is well organised.
  - Use paragraphs & sections to signal topic changes.

Submitting the Paper

- Ensure publishers instructions met.
- Ensure you have copyright permission,
  - e.g., for images.
- Cut/précis material to meet size restrictions.
- Circulate to colleagues to get feedback.
  - Ensure you leave them plenty of time.
- If you are running late ask for an extension.
  - Always ask *before* the deadline.
- Submit in required form.

Responding to Referees

- **Politely remind journal editor if no response after a few months.**
- **Read through referee's comments carefully.**
  - **Sleep on them before correcting.**
- **Ensure you address *all* comments:**
  - **May need to head-off misunderstanding;**
  - **Ask colleague to check comments met.**
  - **Include covering note on how comments addressed (or why ignored).**

The Final Stages

- Prepare camera-ready manuscript.
- May submit source and/or object versions.
  - Images etc as separate file.
  - Depends on type of publication:
    - Journal vs conference vs book;
    - Electronic vs hardcopy journal.
- May get galley proofs from printers.
  - Need to address printer's comments.
  - Learn printer's annotations.
- Submit to university publication repository.

Exercise

What has been your experience in submitting papers?

The Refereeing Process

The Refereeing Process

- Journal Editor or Conference Programme Chair chooses 2 or more referees.
- Each referee reads paper, writes report and makes recommendation.
- Editor/PC makes final decision.
- Journal may involve multiple rounds,
  - usually no more than two.

Possible Outcomes

- Accept with no change (unusual).
- Accept with minor change.
- Accept after major rewrite (journal only).
- Accept as poster or short paper (conference only).
- Reject.

Basis of Decision

- Relevance to remit of journal/conference.
- Significance of achievements.
- Originality of achievements.
- Technical/methodological validity.
- Presentation.

Refereeing Process: Workshops and Conferences

- **Most Informatics workshops and conferences are refereed.**
  - **Allows you to include in pub list.**
- **Limited space allowed: 2-15 pages.**
  - **Usually too short for archival account.**
- **Strict deadline for submission.**
- **Only one round of refereeing.**
- **Can lead to miscarriages of justice.**

Refereeing Process: Journals

- All journals are refereed.
- No space limits:
  - Although 30-40 pages is normal.
  - Size may be proportional to significance.
- No deadlines.
  - Except for special issues.
- Refereeing can be multiple round.
  - Can take years!

Examining Process: Theses

- External and internal examiners.
- University sends submitted thesis to examiners.
- Examiners hold oral examination.
  - Variety of outcomes: no corrections, minor corrections, major corrections, further research, `consolation prize', fail, …
  - You agree timescale for corrections.
  - Examiners check corrections.

Dealing with Criticism

- **Always unpleasant:**
  - **Especially if rejected.**
  - **If you never fail then you are insufficiently ambitious.**
- **Sleep on it.**
- **Learn from it.**
- **Ask colleague for advice.**
- **Always try to address it:**
  - **But it may be based on misunderstanding.**
  - **Ensure aims, hypothesis, etc are clearly stated.**

Concluding Remarks

- **Paper publication is the main product of your research,**
  - **and the key to a successful career.**
  - **So give it your best shot.**
- **Writing a paper will be harder work than you imagine.**
  - **Multiple rounds of feedback and correction.**
- **Receiving and responding to criticism positively is the key to success,**
  - **but is still tough to deal with.**

Exercise

- Swap 300 word research abstract with a neighbour.
- Referee your neighbour's outline.
- Return (and accept) an annotated outline with a smile ☺.