

Communication in Computer Science

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The complete title

Tips and Tricks
for Communication in Computer Science:
Reviews, Papers and Talks

Plan

- PhD studies
- how to teach
- about papers

A hands-on approach.

PhD studies: a transmogrification

From studying known things...

PhD studies: a transmogrification

From studying known things...

...to researching new things.

Fact: You will change

Your first research paper will mobilize
all your intellectual resources.

It will be exhausting.

Yet by the end of your PhD studies
you will have all your papers in mind.

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PhD studies: a genuine mind expansion.

About this mind expansion

An expanded mind
is precisely what is expected
from someone with a PhD degree.

Things are different doing research

- A researcher is more on his/her own than a student.
- New results are not presented like known ones.

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The issue is

- not to “show that you know” as in an exam;
- but to genuinely explain something new.

Question: **Where do ideas come from?**

Answer: Partly from

where you are here and now.

So: Welcome and enjoy the challenging ride.

Plan

- PhD studies ✓
- how to teach
- about papers

Teaching

Or more precisely: TA'ing.

Challenge:

teaching driving / flying / parachuting / etc.
is not as compelling as
teaching CS / IT.

Common modern attitude to education

- “Freedom is to say no.”
- “It is only work if you have to do it.”
– Calvin
- Fragmented knowledge
and the ‘fire and forget’ syndrome.

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and the ‘fire and forget’ syndrome.

One cannot **teach on an empty stomach**
but **teaching on a full stomach** is difficult too.

Converse attitude (1/2)

“Before giving every lecture,
I remind myself that in all likelihood
I am not the smartest person in the room.”

– Jørgen Stegelmann
(interview on Danmarks Radio)

Converse attitude (2/2)

“You can learn all the math in the 'verse,
but take a boat in the air that you don't love,
she'll shake you off
just as sure as the turn of the worlds.”

– Captain Malcom Reynolds
(Serenity)

From teaching to researching

Research: often, not so much
a look at new things
than a new look at things.

Allan Thomson to Captain Haddock:

“Do you sleep with your beard below
or above the sheet?”

Psychological vs. ethical issues

Before the question: no deliberate choice.

(Psychological: **involuntary.**)

After the question: a deliberate choice.

(Ethical: **voluntary.**)

The overall point of these lectures

To go from a **psychological** state
to an **ethical** state
by raising our awareness.

Plan

- PhD studies ✓
- how to teach ✓
- about papers

Writing

Goal of PhD studies:
writing a PhD dissertation.

The bottom-up approach

Writing and publishing scientific papers.

A paper: the prime medium for reporting scientific results

In computer science: the conjunction of

- something **conceptual** (and preferably **new**),
- something **sound**, and
- something **practical**

that is **relevant today** (read: IT).

Plan of the rest of today's lecture

1. The variety of papers
2. Reading a paper
3. Refereeing a paper and receiving a review
4. Writing a paper

The variety of papers

- Unpublished draft.
- White paper.
- Tech report.
- Workshop paper.
- Conference/symposium paper.
- Journal paper.
- Also: submitted / revised / final / extended.

The draft

Definition: the first shape assumed by a paper.

Use: for the author and
for his immediate collaborators.

Quality control: the author(s).

The white paper

Definition: a complete draft on one's web page
or a research proposal.

Use: advertising.

Quality control: the author(s).

The tech report

Definition: a draft readable by others.

Use: either as a time stamp
(new draft with a new result),
or for the record
(old draft with lots of detail).

Quality control: maybe a few colleagues & students.

The workshop paper

Definition: a record to document a talk.

Use: communication among specialists.

Quality control: the program committee (if any).

The conference/symposium paper

Definition: a record documenting a talk.

Use: communication in a larger community.

Quality control: the program committee.

The journal paper

Definition: the author's final word
on a particular topic.

Use: archival purposes.

Quality control: the journal reviewers.

The tech report (revisited)

Definition: extended version of a conference /
journal paper.

Use: typically includes all the proofs
(no copyright restrictions here).

Quality control: the reviewers.

The draft (revisited)

Definition: an unpublished paper.

Use: like wine, a draft may improve with age.

Quality control: unspecified.

Plan

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Reading a paper

- Information acquisition and retrieval.
- Critical reading.

Information acquisition

In principle, a paper provides enough information for its reader to reproduce its contents:

- proof,
- experiment.

Information acquisition

Exercise: Think of the corresponding criterion
for an overview / survey paper.

Trust in the paper

Directly proportional to

- its advanced state: journal versions are more trustworthy than conference versions;
- its forum.

Information retrieval

It is a good idea to keep reading notes
(minimally as annotations in one's bibfile).

NB. It is a bad sign never to re-read anything.

Critical reading

The three stages of reading (as one grows up):

1. the books say blah and thus it is true;
2. this book says blah;
3. the author wrote blah.

Examples

1. “Introduction to Data Bases”
2. “Advances in Data Bases”
3. “A New Technique for Query Processing
in Object-oriented Data Bases”

More examples...

- “The λ -calculus with applications”
- “A λ -calculus for nameless dummies”
(foreword by N. de Bruijn)
S. Oterik
LetsGetRichQuick, Ltd. (1972)
- etc.

Back on track

Here: paper, not book.

But one's critical sense should still apply.

On reading critically

Don't swallow the author's propaganda,
accepting the paper as the author shaped it:

- disassemble it to identify its real thrust;
- appreciate;
- probe / question / stress;
- (if needed) reassemble: minimize / expand.

A concrete example

AT&T's "1-800-OPERATOR"

VS.

MCI's "1-800-OPERATER"

Scientific reading (ended)

A paper should provide enough information for its reader to reproduce its contents:

- proof,
- experiment.

But does it?

What if

- What if you don't understand something?
- What if you think you found a bug?

Recommendation:

1. Consult people locally.
2. Send a very polite e-mail to the author
(keeping in mind that you may well be wrong
yourself).

Prudence: You don't just represent yourself.

You represent **your adviser** and **your institution**.

The issue of one-upmanship

Standing on the shoulders of giants

vs.

standing on each other's feet.

Plan

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Refereeing a paper

What: the cornerstone of quality control.

How: peer review.

Reference: Parberry's guide for new referees.

The actors in presence

- The author(s).
- The editor / program chairman.
- The reviewers.

The point of refereeing a paper

Quality control by peer review.

The timeline for conferences

- A paper is submitted.
- It is allocated to PC members and often subcontracted to external reviewers.
- Reviews are collected.
- A decision is taken at the PC meeting.
- Reviews are sent to the author(s).

The timeline for journals

- A paper is submitted.
- It is allocated to external reviewers.
- Reviews are collected.
- An editorial decision is taken:
accept / reject / revise.
- Reviews are sent to the author(s).

Conferences: one-way communication

- Would the paper help making the conference a success?
- If not accepted, try another conference.

Journal: two-way communication

- Is the paper in archival form?
- If not, revise it and try again.

The point of view of the author

The idea is to try to give all the information

to help others to judge your contribution;

not just

the information that leads to judging it

in one particular direction or another.

– Richard Feynman

The point of view of the reviewer

One never notices **what has been done**;
one can only see **what remains to be done**.

– Marie Curie

Writing a review

Canonical reference: Parberry.

- Is it correct, worthwhile, readable, etc.?
- Which kind of paper is this:
groundbreaking, improving, fixing,
surveying, etc.?

The curse of novelty (flip side)

It's got to be new!

It's got to be relevant!

The curse of novelty (flop side)

...but it's not new!

The curse of relevance

“In the Late Cretaceous”

Connie Willis, 1992

A must-read.

Some elements for a review

1. Convey your understanding of the paper with a summary.
2. Double up with an analysis.
3. Sum up with an assessment and a recommendation.
4. Add a list of remarks, if any.

Context of the review

- Be objective.
- Be fair.
- Don't delay.
- Be courteous.
- Remain confidential.

To summarize

- Reviews should be as **comprehensive** as possible.
- Reviews should be as **courteous** as possible.
- Reviews should be as **selfless** as possible.

The job of a program chairman

Assemble the best possible program
(at the cost of rejecting good papers).

The job of a journal editor

Make the journal as good as possible.

The job of an author

To cooperate with the reviewing process.

The job of a reviewer

To provide impulse in the reviewing process.

Choosing reviewers

- Competence.
- Availability.
- Depth / breadth.

You, reviewer

- One among several others.
- Your anonymity.

Extracting reviews from reviewers

- It may take persistence.
- The more competent, the more busy.

Synthesizing the reviews

- Accept / revise / reject.
- Editors sometimes moderate the reviewers by coming back at them.
- Get back to the author(s).

Receiving a review

- Rod Burstall's take: a review is an **offering**.
- The Dilbert syndrome.

Receiving reviews

From my close observation of writers, they fall into two groups:

1. those who bleed copiously and **visibly** at any bad review, and
2. those who bleed copiously and **secretly** at any bad review.

– Isaac Asimov

Facts

Nobody likes a bad review.

Most reviews are critical.

Take a holistic approach

- Distinguish between your work and your ego.
- Identify the cause of the criticisms and fix it.
- Rearrange the rest of the paper to fit.
- Persist: “If you don’t fight for your ideas, nobody will.” – John Reynolds

Take a holistic approach

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(Corollary: “and will take credit for it.”)

Together with the revision

- Comment the reviews pointwise:
the reviewers will appreciate to see
each of their points addressed upfront.
- Thank the reviewers for their time:
they are actually your best allies.
- Finally, consider using [latexdiff](#):
it is surprisingly useful.

Sending the revision

- Expect an acknowledgment.
- Be prepared to be moderated.
- Think of pinging the editor after 3 months.

Choose your editor wisely

- Rare are papers that don't need any help.
- An indifferent editor is rarely of help.

Reviews and the paranormal

Feynman's advice about the paranormal:
keep track of presentiments,
for you only remember them selectively.

Here: keep track of both good and bad reviews,
for you also only remember them selectively.

Good reviewing experiments

- The submission is speedily reviewed.
- It is accepted (with minor changes).

Good reviewing experiments

- The submission is speedily reviewed.
- It needs to be revised,
but with very useful reviews.
- It is accepted.

Not so good experiments

- The submission needs a lot of pinging.
- The reviews are lousy.
- You give up.

Not so good experiments

- The submission needs a lot of pinging.
- The reviews are lousy.
- You persist.
- The revision needs a lot of pinging.
- etc.

Yet reviews can be useful

Some reviewers are amazingly good,
and they lead you to a better paper.

Why you should review

You expect reviews on your own work,
don't you?

All in all

- Peer reviews: The means of quality control.
- We should all contribute to this quality control.
- We all try to survive them, even though they do make us a little weird.

Plan

1. The variety of papers ✓
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Writing a paper

A paper is written for others to read:

- reviewers,
- yourself in the future, and
- people you don't know yet.
(Example: Zhe Yang.)

It should thus reflect
all the concerns just mentioned:
readability, clarity, etc.

On clarity of thought

Question: What's E.T. short for?

On clarity of thought

Question: What's E.T. short for?

Answer: 'cause it's got such little legs!

On clarity of thought

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Answer: 'cause it's got such little legs!

Form matters.

Poor form hints at muddled thinking.

Slight digression

Why IT is more fun than CS
(maybe)

The thesis

IT is more fun than CS
because one involves cooler things.
(esp. if one is a fan of Star Trek)

On the other hand

Mindlessness is still lethal.

In fact, it is even easier to fall for it.

Case in point

Pervasive 2005

<http://www.pervasive.ifi.lmu.de/p>

Session 2: Activity and Context

The session (1/4)

Bathroom Activity Monitoring Based on Sound

Jianfeng Chen, Alvin Harvey Kam,
Jianmin Zhang, Ning Liu, Louis Shue
Institute for Infocomm Research, Singapore

The session (2/4)

Simultaneous Tracking and Activity Recognition (STAR)

Using Many Anonymous Binary Sensors

Daniel Wilson

Carnegie Mellon University, USA

The session (3/4)

Enhancing Semantic Spaces
with Event-driven Context Interpretation

Joo Geok Tan, Daqing Zhang,
Xiaohang Wang, Heng Seng Cheng
Institute for Infocomm Research & School of
Computing/National University of
Singapore(NUS), Singapore

The session (4/4)

The Java Context Awareness Framework (JCAF)

A Service Infrastructure
and Programming Framework
for Context-Aware Applications

Jakob Bardram
University of Aarhus, Denmark

The abstract, minus the last sentence

In this paper an automated bathroom activity monitoring system based on acoustics is described.

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In this paper an automated bathroom activity monitoring system based on acoustics is described. The system is designed to recognize and classify major activities occurring within a bathroom based on sound.

The abstract, minus the last sentence

In this paper an automated bathroom activity monitoring system based on acoustics is described. The system is designed to recognize and classify major activities occurring within a bathroom based on sound. Carefully designed HMM parameters using MFCC features are used for accurate and robust bathroom sound event classification.

Abstract, minus last sentence (contd)

Experiments to validate the utility of the system were performed firstly in a constrained setting as a proof-of-concept and later in an actual trial involving real people using their bathroom in the normal course of their daily lives.

Abstract, minus last sentence (contd)

Experiments to validate the utility of the system were performed firstly in a constrained setting as a proof-of-concept and later in an actual trial involving real people using their bathroom in the normal course of their daily lives. Preliminary results are encouraging with the accuracy rate for most sound categories being above 84 percent.

You know what?

I am speechless.

(“Hello happy proofreaders.”)

The last sentence of the abstract

We sincerely believe that the system contributes towards increased understanding of personal hygiene behavioral problems that significantly affect both informal care-giving and clinical care of dementia patients.

The last sentence of the abstract

We sincerely believe that the system contributes towards increased understanding of personal hygiene behavioral problems that significantly affect both informal care-giving and clinical care of dementia patients.

This last sentence changes everything!
(And I am no longer speechless.)

The reality

- A sub-optimally phrased title, and
- a sub-optimally written abstract.

Yet a potentially important work!

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- a sub-optimally written abstract.

Yet a potentially important work!

It is difficult to write a paper.

The story behind the paper

Courtesy of Jakob Bardram.

The story behind the paper

Courtesy of Jakob Bardram.

...back to business.

Organization

- Title / list of authors / abstract.
- Introduction / compelling example / related work / overview.
- Development.
- Conclusion (if any).
- Acknowledgments / references.

The title

- It should be informative.
- It should be concise.
- It should be catchy / memorable.
- It needs to be original.
- It does not need to be funny.

On the temptation of being funny

The messenger can hide the message.

Circus analogy: Do you want to be remembered

- as **a clown** (form), or as
- **a trapeze artist** (contents / achievement).

Besides, most funny titles

do not convey concrete messages:

they tend to be puns or insiders' jokes.

On the temptation of being sophisticated – or not

- “The eductive interpreter.”
- “Fuzzy maths”

The list of authors (1/2)

- Alphabetically ordered;
- ordered by “degrees of contribution”;
- student first, adviser second;
- etc.

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- etc.

Key: the message should be more important
than [the order of] the messenger[s].

The list of authors (2/2)

Why don't you write a single-authored paper?

- It would show the world that your PhD adviser is not just **a researcher**, he is also **a successful mentor**.
- Plus – could you do it at all?
(Consider this a challenge.)

The abstract

- It should be brief.
- It should be as informative as possible.
- It should be updated last
(to account for the contents of the paper).

The abstract (continued)

Fact:

Many more people will read your abstract
than your paper
(e.g., in a bibliographic data base).

Titles, abstracts, data bases, and search engines

Abstracts: the key to locate papers on the web.

Abstracts are stored textually,
so they should NOT contain formulae,
special symbols, or bibrefs. (Ditto for titles.)

A reminder

An abstract is not an ad:
there is no need to repeat
the name of your product.

Your introduction should

- start with a bang;
- stop with an overview of what follows;
- mention your prerequisites and notations;
- and
- clearly state the achievement of your paper.

A compelling example is always good, especially in a submission.

Starting with a bang

- “It was a dark and stormy night.”
- “The house had a slight German accent.”
- “He awoke—and wanted Mars.”
- “Whatever your gravity is when you get to the door, remember—the enemy’s gate is *down*.”
- “Mr. and Mrs. Dursley, of number four, Privet Drive, were proud to say that they were perfectly normal, thank you very much.”

Opening sentences of dissertations and more

Absolute **must read**:

Olin Shivers's dissertation advice

<http://www.ccs.neu.edu/home/shivers>

Eye catchers

- First words.
- Last words
(of paragraph / section / chapter / thesis).
- Capitalization (in an abstract).

Pitfalls

- Exaggerating.
- Seeking effect for seeking effect:
“This paper bridges a much needed gap.”
(quoted by Neil Jones)
- Practicing Cooper’s prose (cf. Mark Twain).
- Misspelling (always use a spell checker!).

Standing on the shoulders of giants

Disparaging earlier work invites the reader to disparage your own work.

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Better positivize!

Positivise

For example:

- The goal is blah,
and it would be great to reach it.
- What has been done so far is remarkable,
but it does not quite reach the goal.
- In this paper, we take one step further
towards the goal.

Development

- Organized in sections.
- Should be progressive.
- Should be as complete as possible.
- Should be as concise and precise as possible.

Related work

- Mandatory.
- Situates the novelty and significance of your work.
- Where: either part of introduction, or part of conclusion, or stand-alone section (second or second-to-last).

What to do? What to write?

A section on related work is **not a matter of citing.**

It is **a matter of comparing.**

Related work

Main pitfall:

Forgetting or mispresenting
someone else's work.

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someone else's work.

In Simon Peyton Jones's words:

Related work should be celebrated.

Bibliographical references

Bibrefs should be used parenthetically, so that they do not interrupt one's reading.

Example: "...as seen in [2]." is awful, and so is
"[KAZAM97] shows that..."

Better: "...as introduced by Church in his monograph on the λ -calculus [2]."

The conclusion

None in the mathematical tradition.

Minimally:

- recapitulates the problem and the contribution;
- assesses the significance of the contribution;
- suggests / outlines future work.

The pitfalls of one's future work

- Often presumptuous:
“Writing a “future work” section of a paper is like a dog pissing on the trees at the boundary of its territory.”
(John McCarthy, 1991)
- Often reveals the limits of the authors' understanding.

The acknowledgments

- Minimally, you should thank your anonymous reviewers.
- Rota's 8th lesson: your proofreaders will appreciate being mentioned.

The references

They must be impeccable:

- accurate (correct year, etc.);
- complete (page numbers, etc.).

Standard pitfall: misspellings in titles.

That was the form.
Now for the content.

Tips for writing a research paper

In general, the contents should come first.
(But often, spelling things out in the paper tends to clarify its contents.)

Approaches:

- Top-down: goal and significance first.
- Bottom-up: results first.

A rule of thumb:
put in your paper what you (would) like to find
in other's papers.

As time goes by

It sounds silly, but...

- remember to date your manuscripts, and
- remember to update your bibrefs
("This paper is superseded by ...").

Proofreading a paper

Form vs. content.

- Form: * what the reader sees
(or doesn't, cf. "The Da Vinci Code");
* translated work.
- Content: what the writer sees.

A subjective perception of one's writing style

- One tends to like one's writing style.
(Example: Harry Mairson's uncle.)
- One is blind to one's flaws.

Proofreading each other

- What: an investment.
- How: with consideration.
- Be prepared to be misunderstood.

Two key resources

Learning by counter-example:

- “How to have Your Abstract rejected”

Mary-Claire van Leunen and Richard Lipton

- “Maxims for Malfeasant Speakers”

Norman Ramsey

Conferences

Watch out for the theme of the conference.

Watch out for the program committee.

Watch out for what needs to be submitted:

- an extended abstract;
- a full version.

Classification (Parberry)

- Breakthrough.
- Ground breaking.
- Progress.
- Tinkering.
- Debugging.
- Survey.

Help the reviewer to make up his mind.

Methodological pitfall

Avoid core dumps:

- the paper should be focused on what it achieves;
- tangents should be eliminated.

Motivational pitfalls

Ambitious: “Let’s write a paper for LICS.”

Opportunistic: “I’ve got to beef up my CV.”

Jealous: “I want more papers than X.”

Competitive: “I want to show that X’s papers
are insignificant.”

Meteorological (esp. in Denmark): “Hmmm...
Hawaii...”

Beyond publishing

Hirsch's index.

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Obrigado.