

Research Methods in computer science

Spring 2023

Lecture 14

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Agenda

Conference updates

Adequate descriptions of systems

Paper review

HW7

The Body of the paper

Depending on the area of work may describe the proposed algorithm, proofs, systems, implementations

[slide from a while ago...]

How much details?

Ideally: Enough for someone to replicate your system or idea

Practical consideration: 1-2 pages.

Illustrations

“One picture is worth a thousand words”

Architecture

Data flow

Try to have 1-2 diagrams describing your system

Code and Data Release

Becoming common in many areas of CS

Important tool for reproducible research

Code and data is not adequate.

Lots of code and data but impossible to understand artifacts

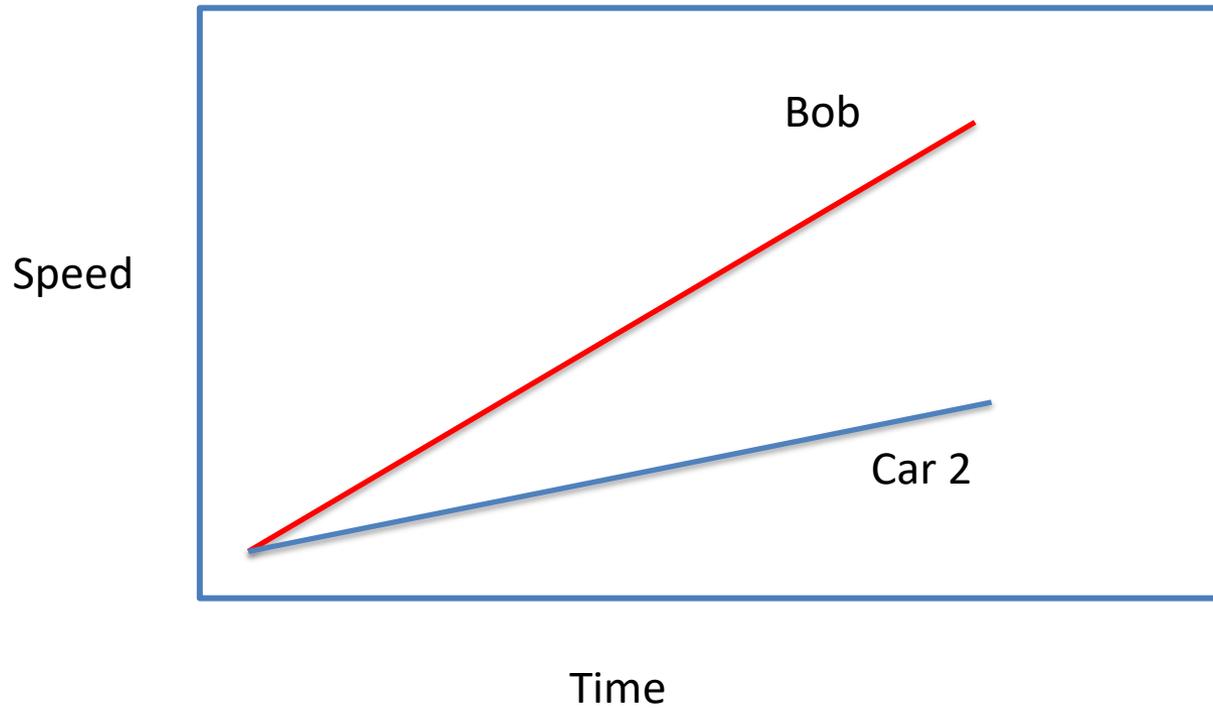
How much details should we use to describe experiments?

Same consideration as describing your system.

An example experiment

- Car1
 - Does not have telemetry
 - Have the driver (Bob) wear smart watch and use GPS on the smart watch to track Bob's speed
- Car2
 - Use built-in telemetry

Results



Consequences of inadequate clarity

An experiment writeup that can be interpreted as proving humans are faster than a car

Content in the following slides adopted from:
<https://mitcommlab.mit.edu/eecs/commkit/journal-article-methods-cs/>

Criteria for Success

All the relevant details for producing your results

Convinces the reader of the correctness of your approach by providing justification for choosing your methodology

Provides readers the details, algorithms, and techniques necessary to confirm and/or replicate your findings

Purpose

Adequate details for others to replicate and enhance your work

Description of device, algorithm, model

Justification (important!)

Randomly decided 5 layers in your neural network??

Results and conclusions valid

Sometimes need to check the methods

Audience

Level of expertise

Generally assume advanced knowledge

Domain expertise

Generally assume experts in the field

If techniques from a different area,
common to provide background

Justification for an approach

Do not just say what your design is.

Why you are using a particular approach?

Why not some other approaches?

Organization

Sub-sections

Bullet points

Paragraphs

Diagrams

Cite methods when possible

“Minimal essential detail”

Reviewing a research paper

Usefulness of Learning How to Review

Look at your paper as a reviewer

Answer potential reviewer questions

Reviewer psychology

Review a few to get a feel for it

Critique

Critique is a method of disciplined, systematic analysis of a written or oral discourse. Critique is commonly understood as fault finding and negative judgment, but it can also involve merit recognition, and in the philosophical tradition it also means a methodical practice of doubt. – (Wikipedia)

Coping with Criticism

Keep it professional

Don't take it personally

Understand it

Respond at the right time

Challenge as appropriate

<http://ckscience.co.uk/candidate/career-zone/work-place-advice/5-ways-to-deal-with-criticism-at-work/>

Do unto others as you would have them do to you. – (lots of places)

A Paper Review

“While the exercise is useful, the paper does not have any new concepts or implementation caveats that I think are worth publishing. All of the design description seems straightforward integration of existing systems. The evaluation is also very weak.”

--- excerpt from a review received by the instructor

A Paper Review

“Despite the limited practical applicability, I find the paper interesting for the sheer courage to try something out of the ordinary and to properly explore its limits.”

-- excerpt from a review received by the instructor

How to Review a Paper?

- Form and Content
- Parts of a paper
 - What do you expect in each paper?

How to Review a Paper? - Considerations

Novelty

Importance

Generality

Rigor

Insights

Typical Template

Summary

Strengths

Weaknesses

Detailed Comments

Justification for these sections?

HW7

System (Design)

Describe your system or approach in about one page.