THE GRACE HOPPER CELEBRATION OF WOMEN IN COMPUTING

Tips, Tricks and Software for Keeping

Mistakes We've Made

Bad Assumptions

- I'm the only person who will ever see this source code

Things to Consider

- Do I work alone, or with collaborators?

- Do I work on multiple machines?

- Do I have limited amounts of storage?

- Do I need to keep paper records, or record data off my computer?
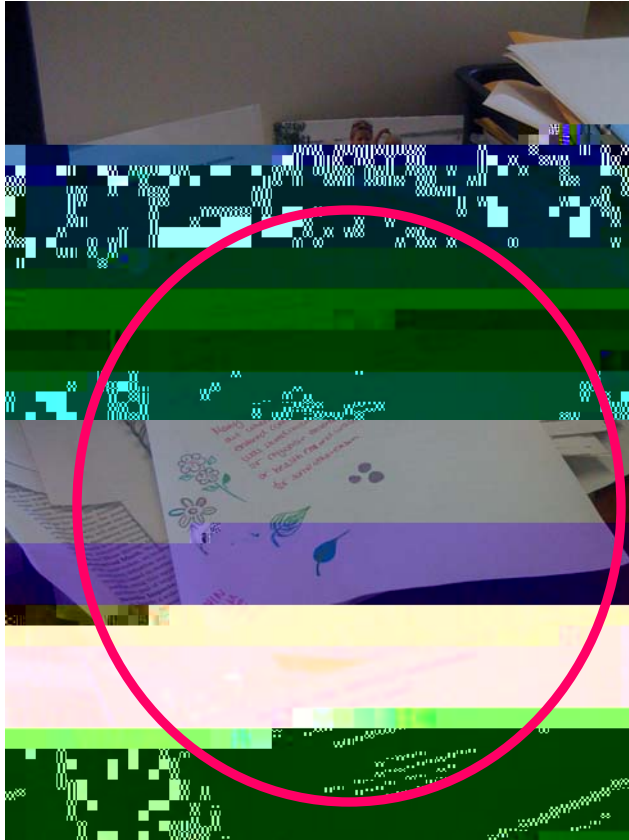
- Is my work backed up?

Staying Organized

1. Ideas
2. Literature
3. Experiments
4. Papers

1 - Ideas

- Keep notes from meetings with advisor, collaborators and reading groups

- Organize by research project

- Track TODO, IN PROGRESS and DONE items. DONE items good for status reports

- Keep open space for random thoughts, and revisit that space later
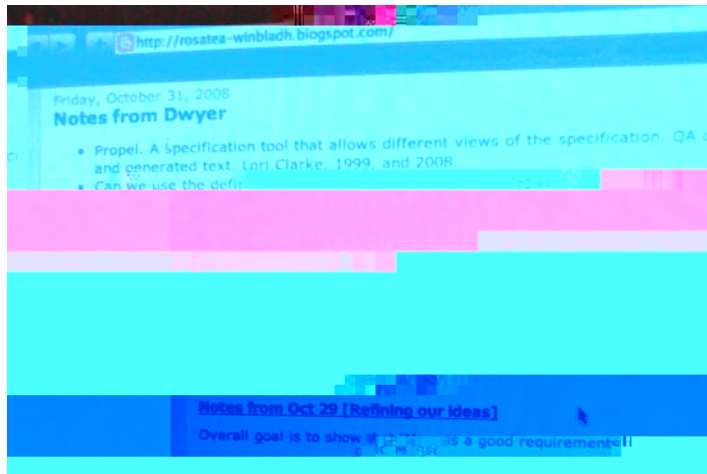
Paper notes

Pros and Cons

Pros

- Temporary notes
- Drawings

Cons

- Losing notes
- Hard to find
- Not searchable
- Not portable

Electronic notes

Pros and cons

- Easy to track progress on •Eroduced massiveon •Difficultsy tshare

Current

Research website (Google sites) with action items

Categorization
Different pages for different notes
Share with group
Track progress
Not public

Department poll

- Do you take notes during meetings with your advisor
  - 13/13 yes
- Do you take notes of research ideas?
  - 11/13 yes
- Do you take notes of todo items?
  - 11/13 yes
- Do you take note of your progress?
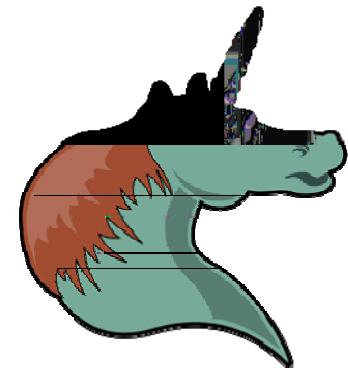 - 9/13 yes

Remember the milk

Evernote

TODO – iPhone app

Mobile Noter – iPhone app

In Summary

- Notes are important!
- Find a tool that works for you
- Tools we've used:
  - Blogs: blogspot, WordPress, Internal tools,
  - Websites: University servers, Google Sites,
  - Electronic notes: Google notes, Word docs,
- There are tons of others as well

Try this!

Homework

- Look at your notes and define characteristics about them
  - Positive and negative
- Think about what you wish for
- Use these characteristics when choosing a note format and tool

Important to me

- Easy to find, consult
- Portable
- Searchability

Staying Organized

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2 - Literature Searches

- Keep track of title, authors, year and publication of papers read (and to read)
- Keep paper copies, electronic copies, or links to electronic copies
  - Especially if you highlighted or wrote notes on them
- Write down a summary of points you've grasped, including any criticisms, questions you have.
  - If you only skimmed the paper, make a note of it.

2 - Literature Searches

How?

- EndNote (Windows, Mac)

- Pybliographer (Linux)

- Bibtex (All platforms, Flat file)

  - Annote or note section for comments

- Zotero (browser plug-in)
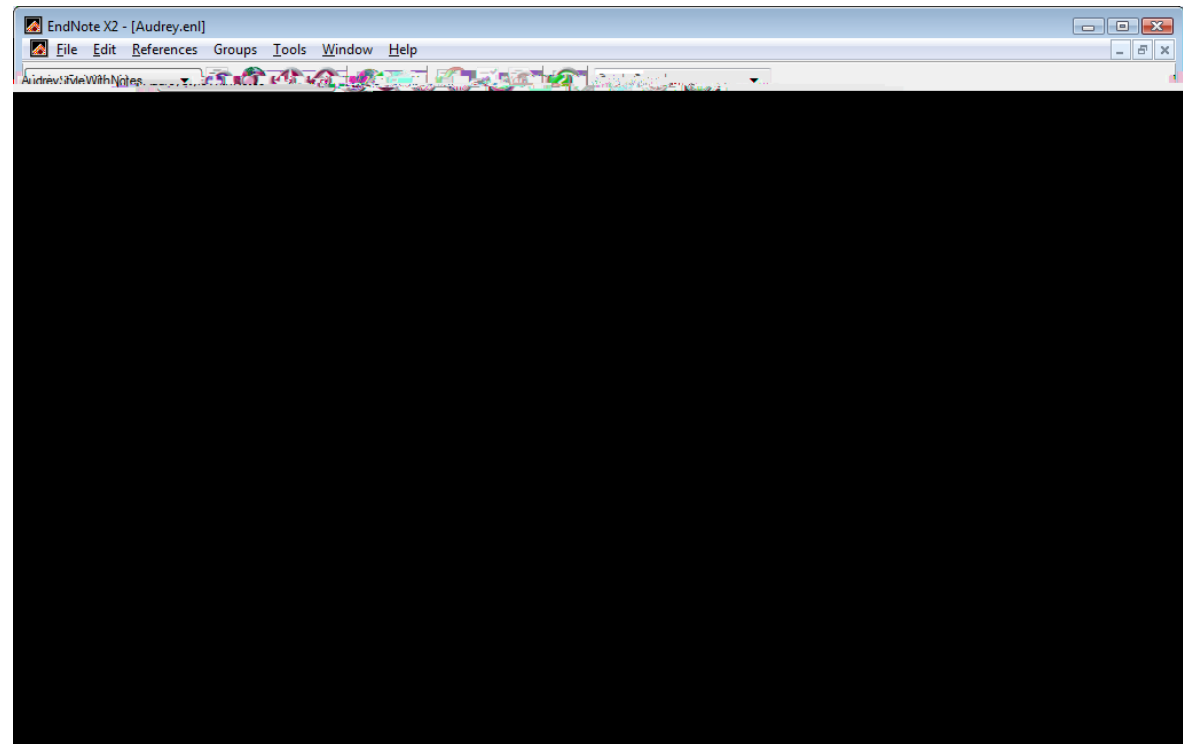
- Mendeley (All platforms, web)

What to look for?

- Make citations and bibliographies for papers

- Takes notes

EndNote X2

Windows, Mac

+ Groups of articles (manual)

+ Smart groups (automatic)

+ Lots of citation styles, manually editable

+ Lots of citations types, manually editable

+ Integrates well with word

- Interface a little slow, not pretty

- $$$

Mendeley

All platforms + web

+ Integrates well with web

+ Extracts references from papers

+ Easy sharing among colleagues

+ Great interface

+ Word plugin

- Limited document types

- No current manual type

- No current manual style
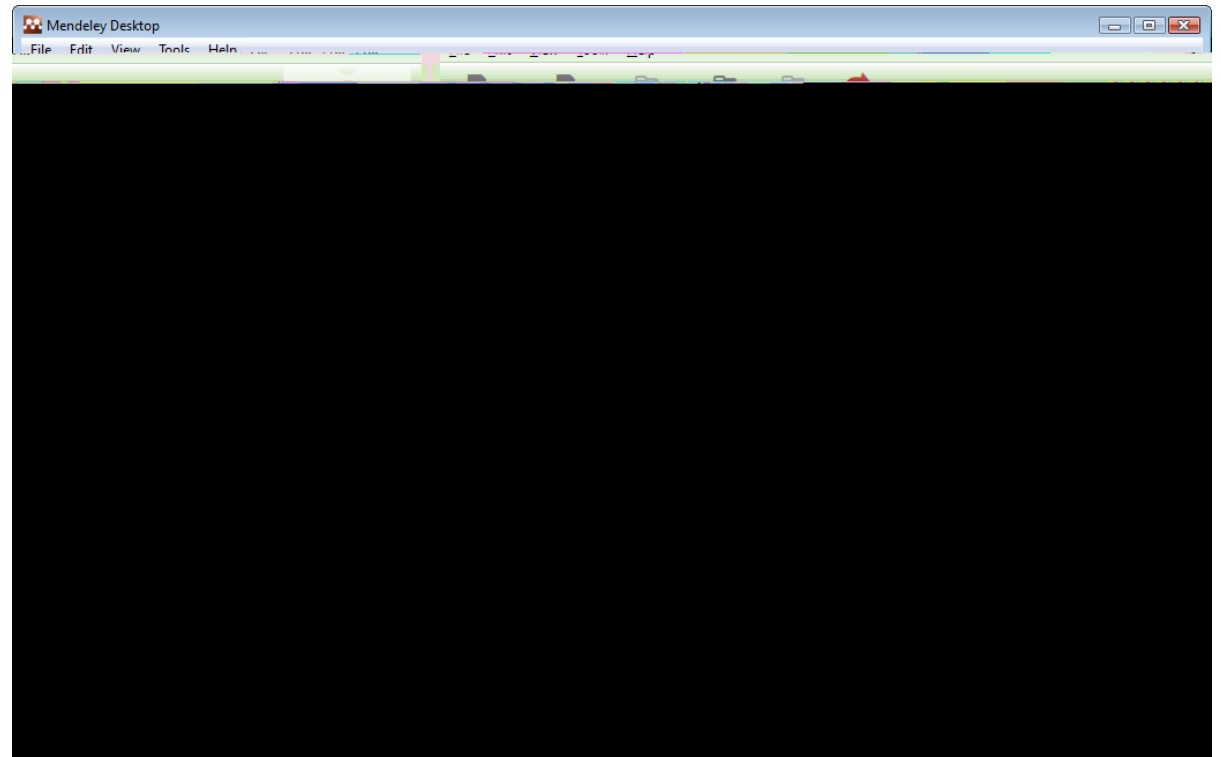
Bibtex

All platform

+ flat file

+ easy to get from ACM and IEEE

+ easy to use with latex

+ machine processable for creating a webpage with all your bibs

+ can include abstract and personal notes

- Not an interface (there are tools)

```
@article{mrx05,
auTHor = "Mr. X",
Title = {Something Great},
publisher = "nob" # "ody"},
YEAR = 2005}

@misc{GHC09,
Author = {Rebbapragada, Umaa and Girouard, Audrey and
Winbladh, Kristina},
Title = {Tips, Tricks and Software for Keeping Research
Organized},
Year = {2009} }

@article{
Author = {Allanson, Jennifer and Fairclough, Stephen H.},
Title = {A research agenda for physiological computing},
Journal = {Interacting with Computers},
Volume = {16},
Pages = {857-878},
Keywords = {physiological computing, Biofeedback, brain-
computer interface, BCI, Affective computing},
Year = {2004} }

@misc{ Ravaja04,
Author = {Ravaja, Niklas and Salminen, Mikko and
Holopainen, Jussi and Saari, Timo and Laarni, Jari and
J\#228, Aki and rvinen},
Title = {Emotional response patterns and sense of presence
during video games: potential criterion variables for game
design},
Publisher = {ACM},
Year = {2004} }
```
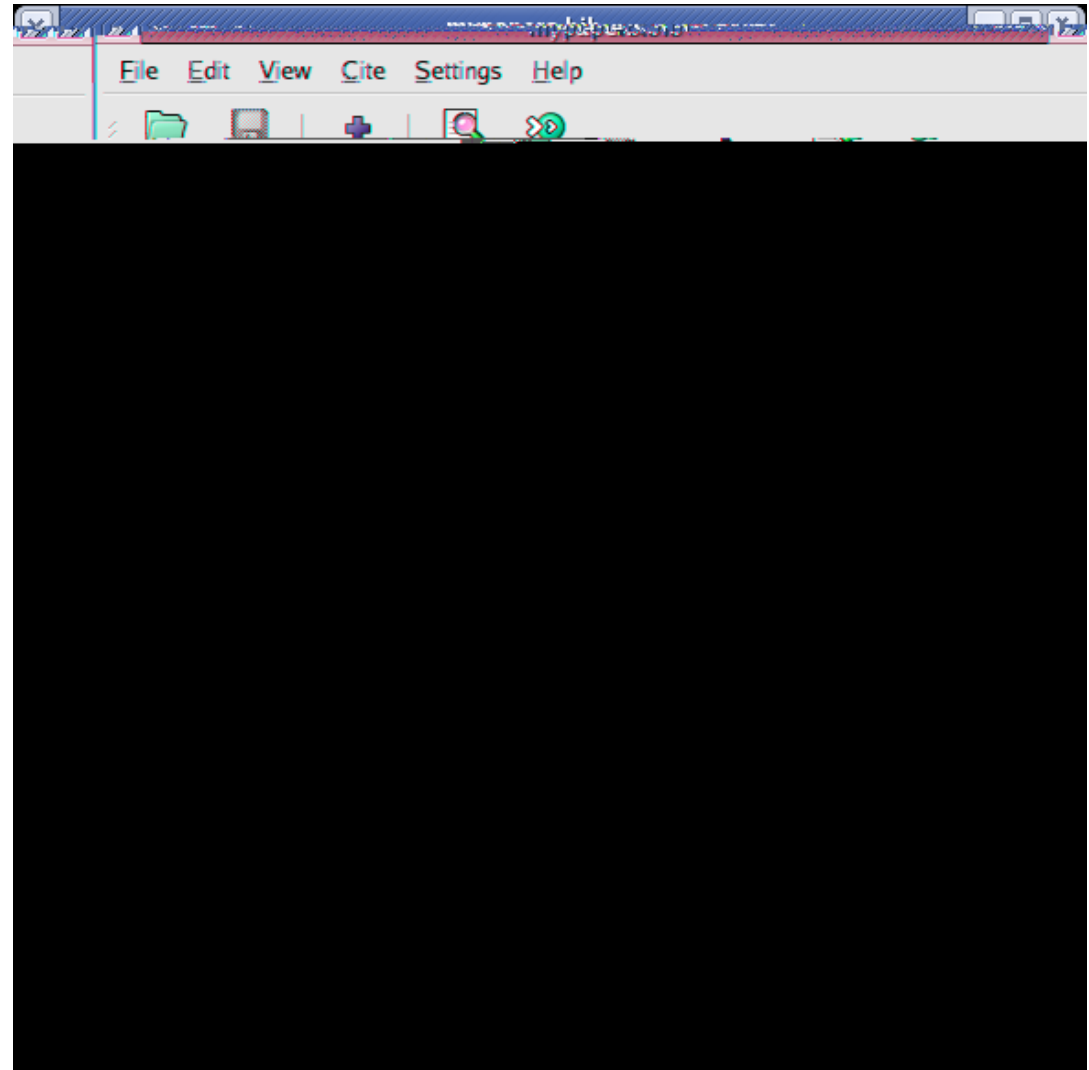
Pybliographer

Linux

+ Interface for bibtex

+ Customizable, searchable interface

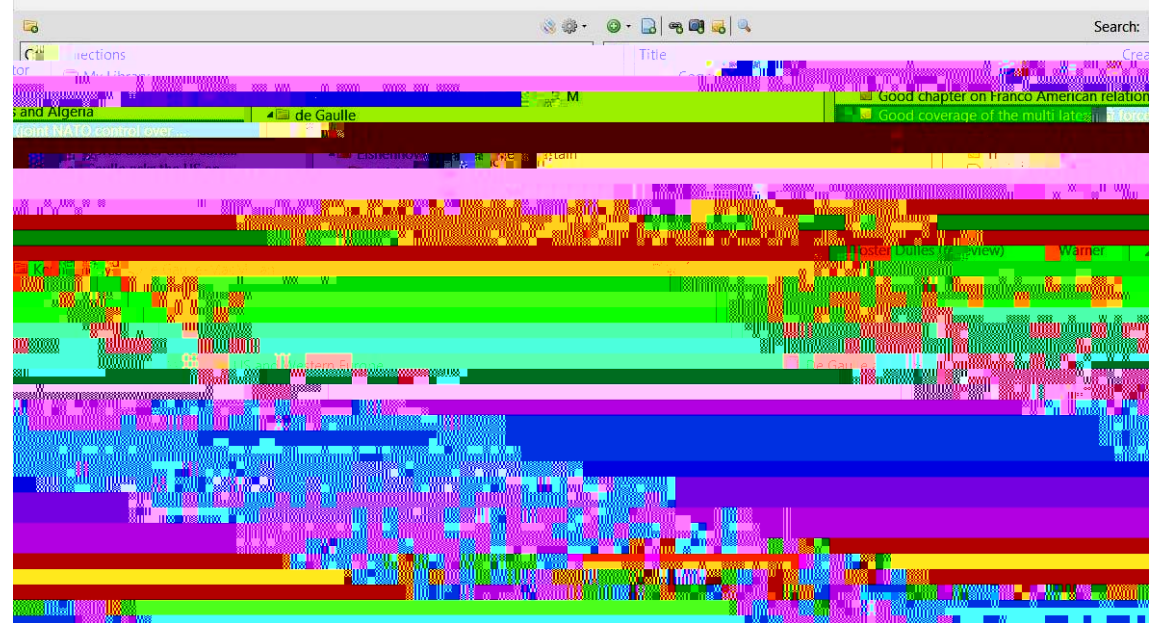+ Integrates with Lyx, Kile, OpenOffice

+ open source (free)

- Preserves data entry inconsistencies (author: J. Doe vs. Jane Doe)

- Feature set is basic; not as impressive as EndNote

Zotero

All platform, Firefox plugin

+ Integrates the actual article with citation

+ Easy to import citations from web

- Write and cite is weak

- slow

3 - Experiments

- What's at stake?

  Sanity – You're redoing an experiment, results have mysteriously changed, and you have no clue why.

  Time – You're revisiting an old piece of code, but because you didn't comment much of it, are spending a lot of time trying to understand it.

  Reputation – You skimped on some error checking, found a bug in your code AFTER you've SUBMITTED the paper, and must withdraw the paper.

3 - Experiments

- Organize filesystem by project, experiment
- Code should be **modular**
  - Separate code for pre-processing data, running your method, summarizing results, creating figures, tables
  - If things go wrong, only need to run portions that went bad
- Experiments should be **reproducible**
  - Store random seeds, input parameters
  - Know versions of code, libraries used

3 - Experiments

```
              ┌─────────────┐
              │             │
              │   Project   │
              │             │
              └──────┬──────┘
        ┌────────────┼────────────┐
┌───────┴──────┐ ┌───┴──────────┐ ┌┴────────────┐
│              │ │              │ │             │
│ Experiment 1 │ │ Experiment 2 │ │   Papers    │
│              │ │              │ │             │
└──────────────┘ └──────────────┘ └─────────────┘
```

3 - Experiments

Experiment 1

| bin	data	in	out	meta	results	figs
Source code, exes, scripts	Input data	Para-meter files, random seeds	Log files, tracing	Temp files holding inter-mediate results	Files contain-ing raw results	Figures, useTc(results)Tj15
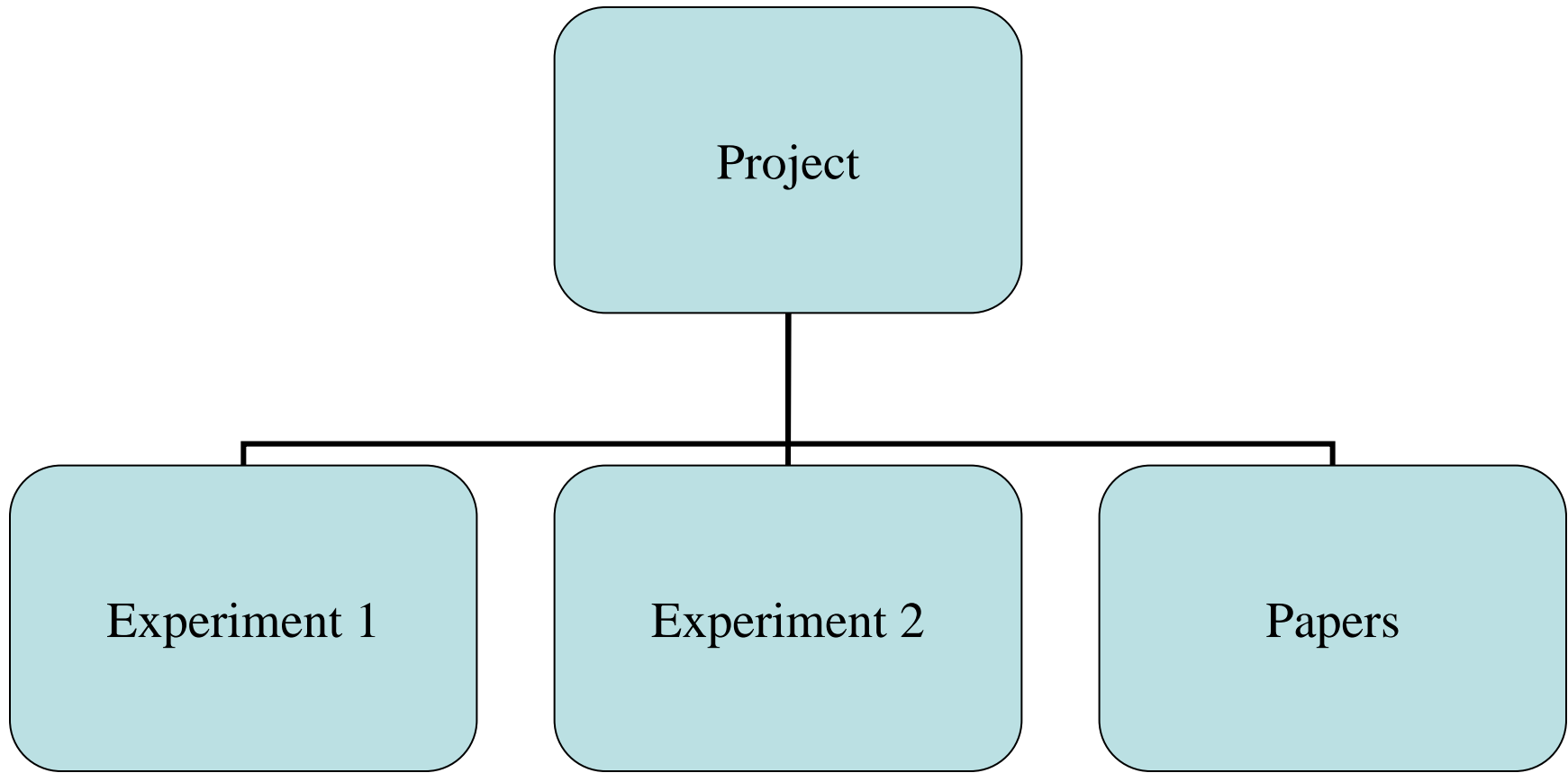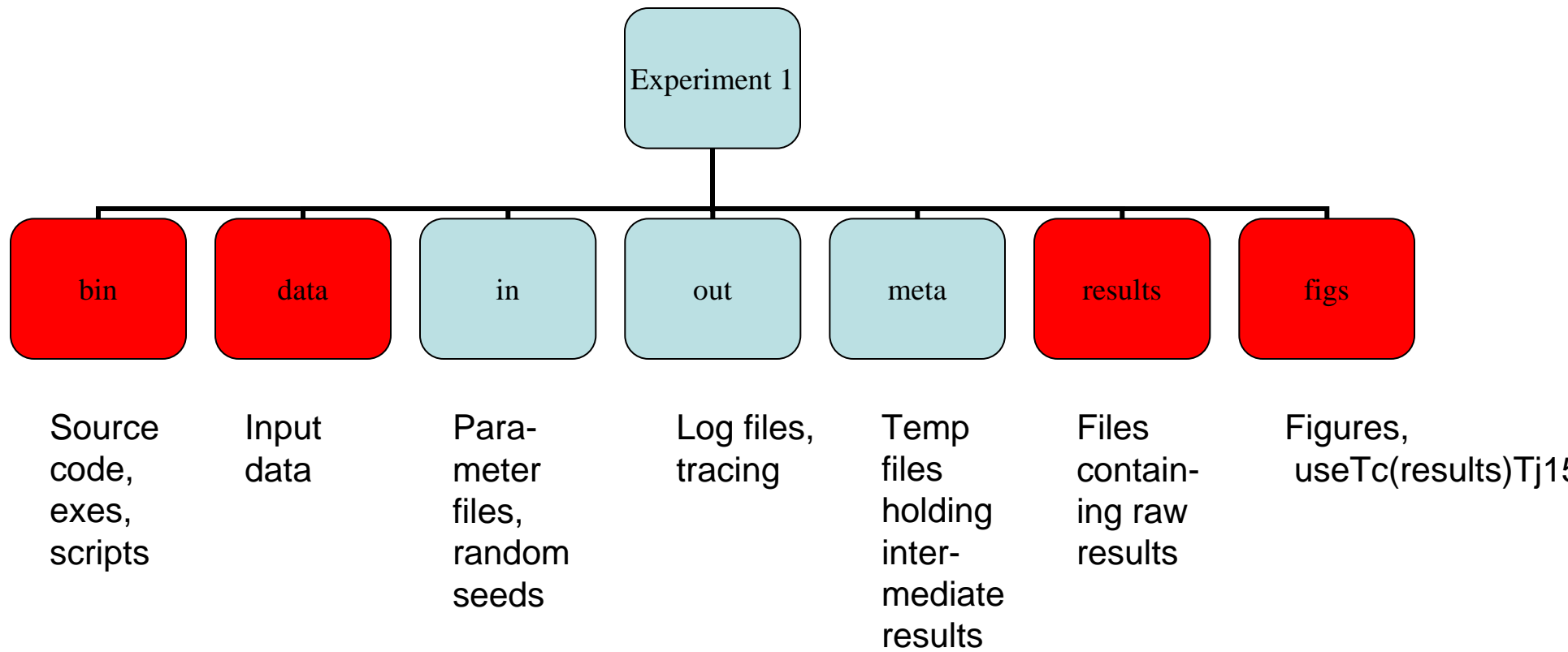
3 – Experiments

- Use good programming practices
- **Handle errors**
- Code unit tests
  - Unix diff is your friend!
- Use an integrated development environment (IDE) which integrates with debuggers, revision control
  - i.e., Eclipse

3 - Experiments

- Use revision control (CVS, SVN, Hg)
- Allows you to sync between different machines
- If multiple users, ensures no collisions
- Use "tagging" to associate a particular version of an experiment (incl. source code and results) with a paper draft

3 - Experiments

Experiment 1

bin	data	in	out	tmp	results	figs
1.14	1.7				1.23	1.4
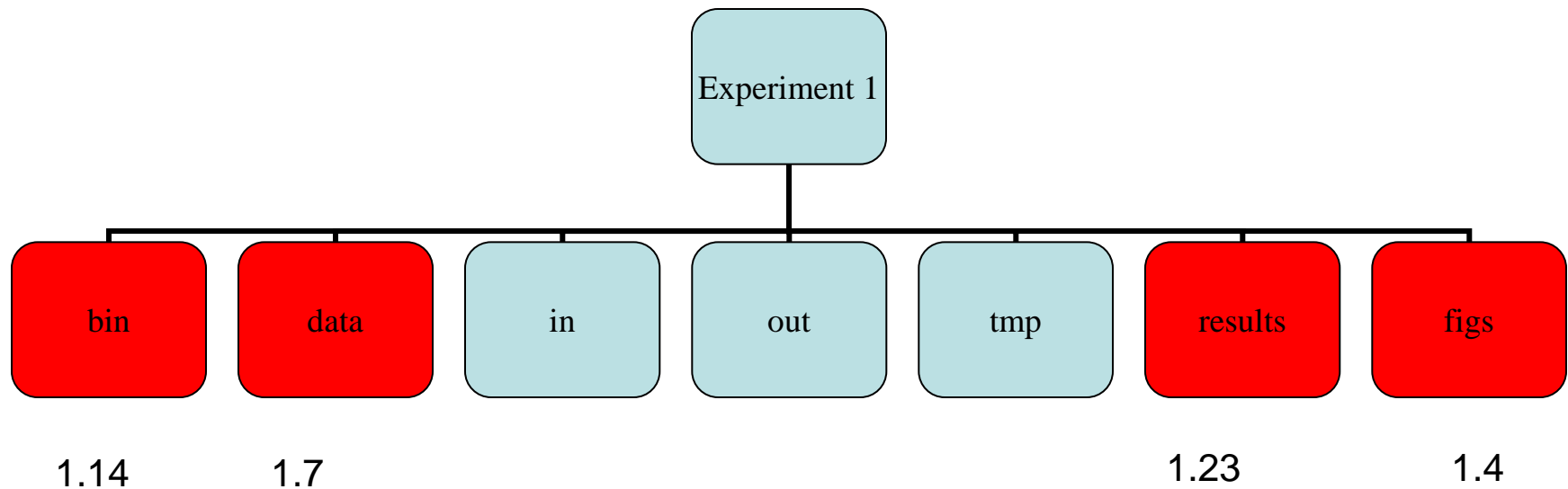
Tag: ICML_2009_SUBMISSION

CVS'd items

3 - Experiments

How?

- Good filesystem organization
- Revision Control
  - CVS, Subversion (SVN), etc.
- Good software practices
  - Use IDEs like Eclipse
  - Use debuggers

What to look for?

- Web-based tools with visual diffs
  - Good for multiple collaborators
- IDE integration with revision control, debuggers

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4 – Writing Papers

- **Keep drafts**

- Use a good LaTeX editor (i.e., Kile, Texshop)

- Use revision control and/or track changes
  - Especially if multiple authors

- Keep track of which version submitted where
  - Multiple revisions submitted to a journal, camera-ready copy

- Start early, writing can help organize your thoughts

Software for Notes

- OneNote

- Word

- Open office

- Google docs

- Text editor

- Emacs org mode

- Latex with svn

- Blogs

- Google sites

- Journal ideas

- iPhone apps

- Notecards

- Mywebspiration online graph making tool

- Citeulike

- Delicious

- Diigo

- Autodesk light

- iPhone whiteboard to share

- Emails

- Mailing list

- Livescribe pen

- Pages (mac)

- Stickies desktop app

Software for Literature

- Endnote
- Pybliographer
- Zotero
- Medeley

- PDF annotater
- Skim (mac)
- PDF exchange
- Envivo 8
- Analyzer
- Atlas ti

Software for Paper-writing

Editors

- Word
- Open office
- Google docs
- TexShop
- Kile
- Lyx
- Winedit

Sync

- Svn
- Dropbox

Software for Experiments

- Eclipse
- Subversion
- Mercurial
- CVS

- Script that gets the svn version for each experiment
- Matlab double quotes can run different parts
- Matlab to publish

Thanks!

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