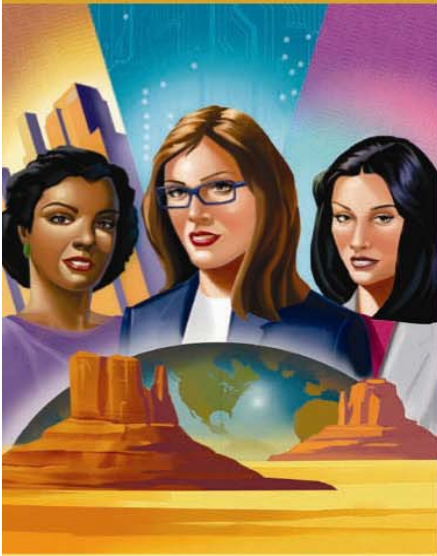


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2009



Tips, Tricks and Software for Keeping Research Organized

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Why Organization Matters for your PhD

- You will do A LOT OF STUFF in 5-7 years!
- Much of it you'll FORGET
- You will WASTE TIME trying to recreate or reproduce work you've already done if you are disorganized
- Your advisor won't teach you this stuff

- IT'S UP TO YOU! -

Mistakes We've Made

- Not commenting code
- Not taking notes during meetings
- Not keeping track of papers we've read
 - Messy stacks of paper on our desks
- Not using revision control for code and papers
- Not writing down research ideas

- NOT WRITING DOWN STUFF! -

Bad Assumptions

- I'm the only person who will ever see this source code
- I'm never going to touch this project again
- I can save time by skimping on the documentation
- I'll remember this
- Organization requires too much time/overhead

- I DON'T HAVE TIME FOR THIS! -

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



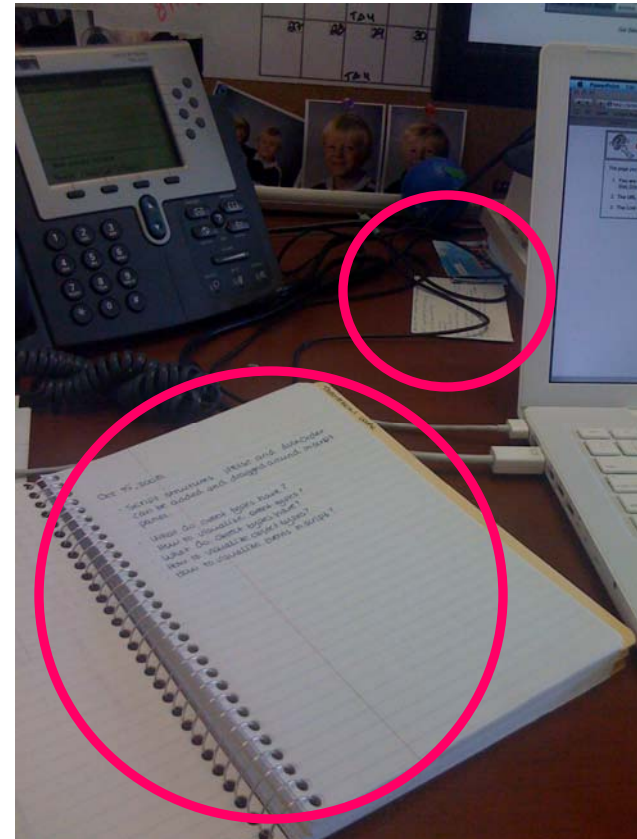
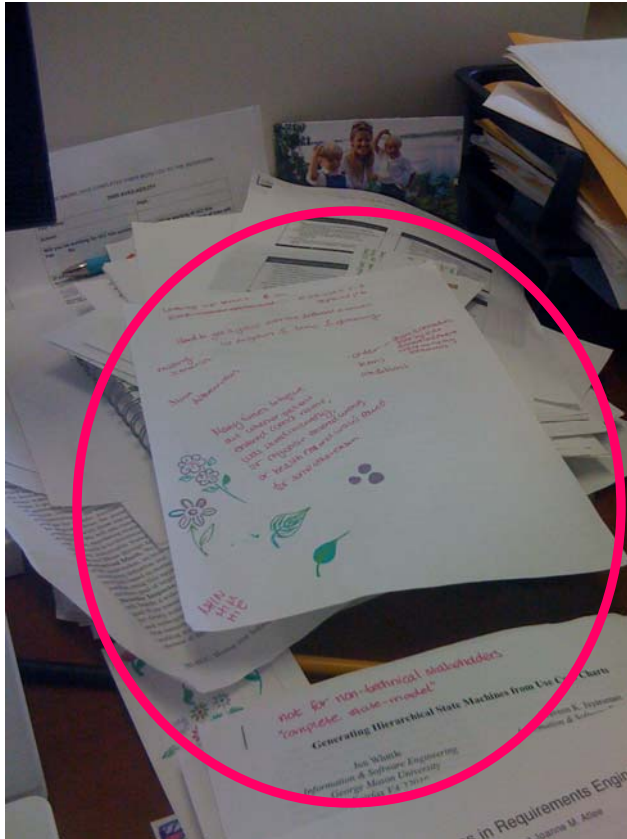
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1 - Ideas

- 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

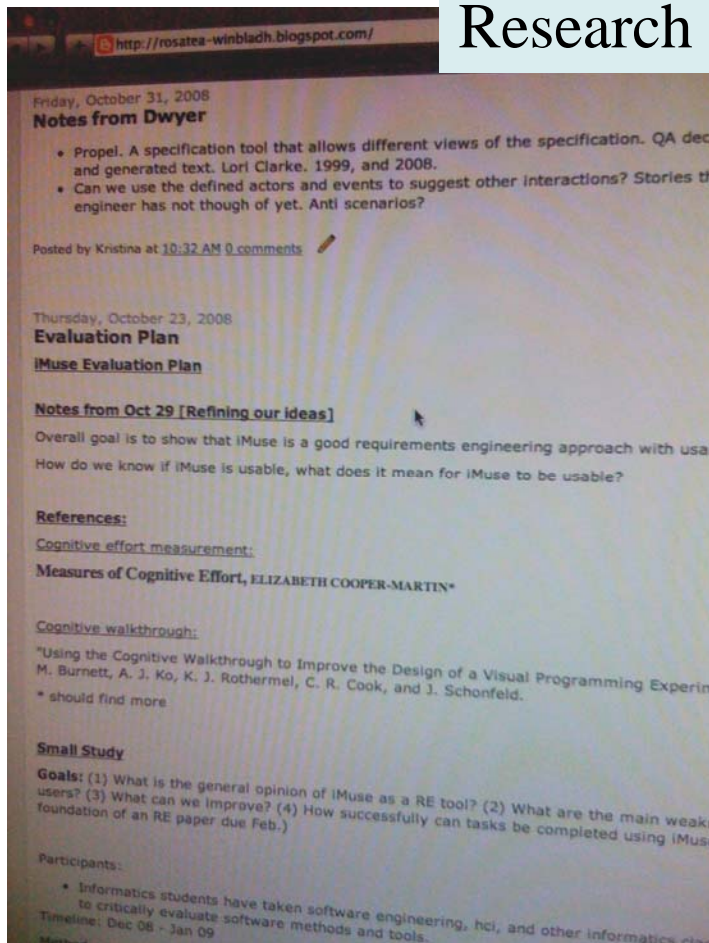
- Temporary notes
- Drawings

Cons

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

Electronic notes

Research Blog



- Difficult to find material from months ago
- Difficult to organize ideas
- Nice journal form
- Group members can follow and comment



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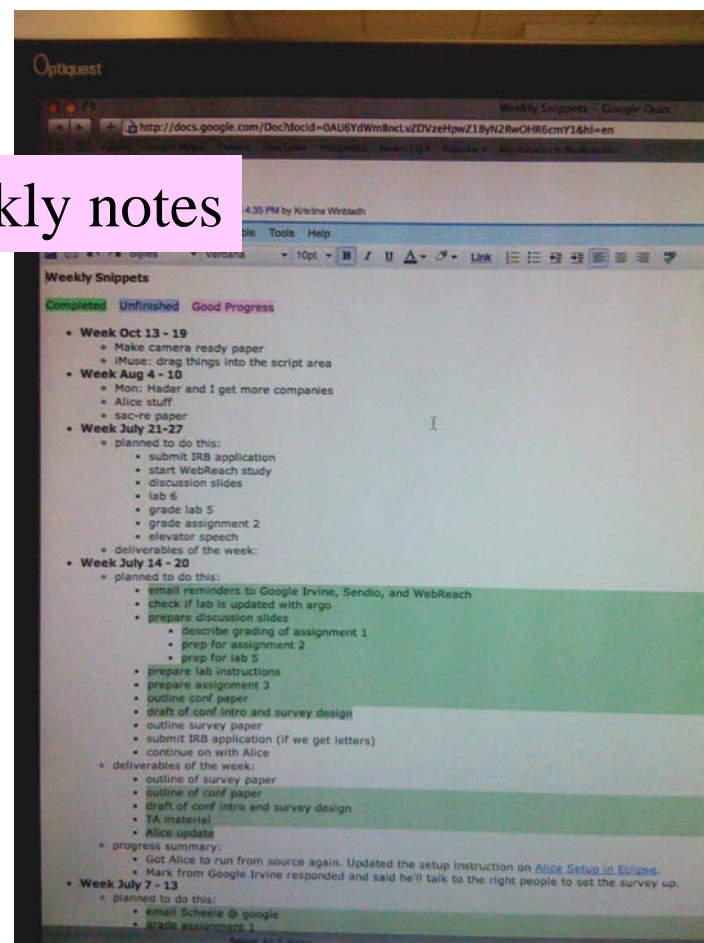
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Pros and cons

- Easy to track progress on items
- Produced massive documents
- Difficult to share with advisor and peers

Weekly notes



Current

Research website (Google sites) with action items

Kristina Winbladh > Action Items >
February 09 - Action Items

[Add item](#) [Customize this list](#)

Category	Description	Deadline	Resolution
Sort ▼	Sort ▼	Sort ▼	Sort ▼
IMuse	Add conditions to panels		
IMuse	Design plan for playback		
TA 191b	Read Team docs		
Paperwork	Complete CCCIP application		
Research	Make topic defense slides	February 17, 2009	
Paperwork	Register for SAC		
Paperwork	Turn in conference grant to SAO		
TA 191b	Revise code review checklist	February 15, 2009	
IMuse	Let users set parameters in world view		
TA 191b	Read usability 3		
Personal	Pay credit card		
Personal	clean apt		
TA 191b	Make new code review groups	February 15, 2009	

Categorization

Different pages for different notes

Share with group

Track progress

Not public



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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



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Remember the milk



Google docs



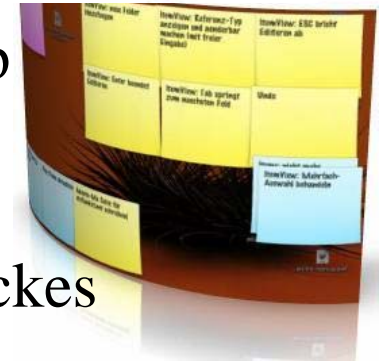
Evernote



Google sites



TODO – iPhone app



Stickers

 pbwiki

Mobile Noter – iPhone app



MS Word



Emacs org mode



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

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

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?

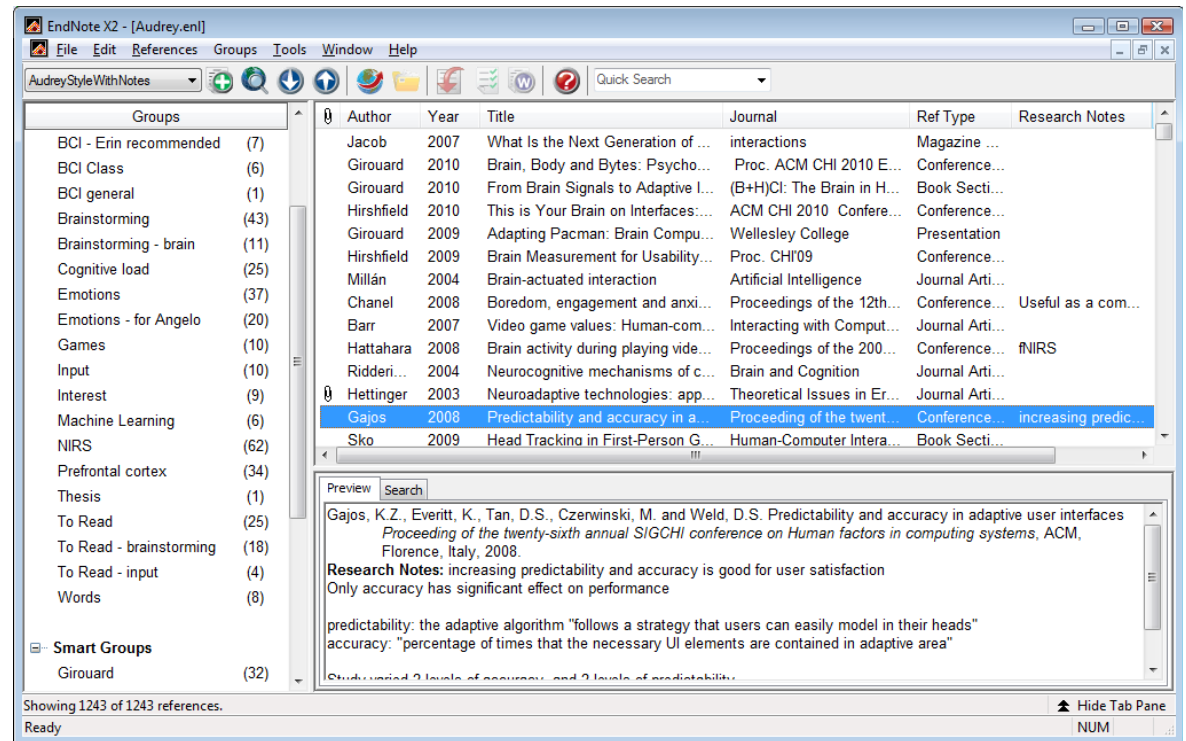
- Make citations and bibliographies for papers
- Takes notes
- Links to PDFs

Try to choose a good system early on (hard to change)

EndNote X2

Windows, Mac

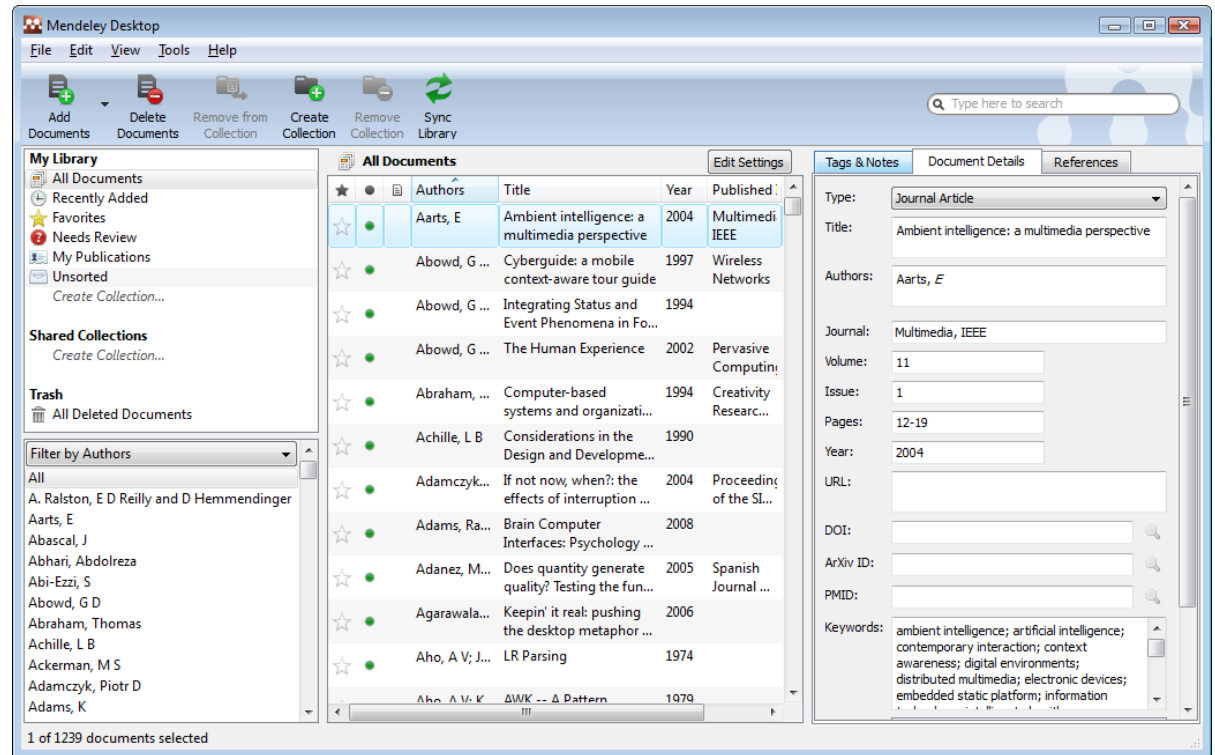
- + Groups of articles (manual)
- + Smart groups (automatic)
- + Lots of citation styles, manually editable
- + Lots of citations types, manually editable
- + Integrates well with word
- Interface a little slow, not pretty
- \$\$\$



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} }
```



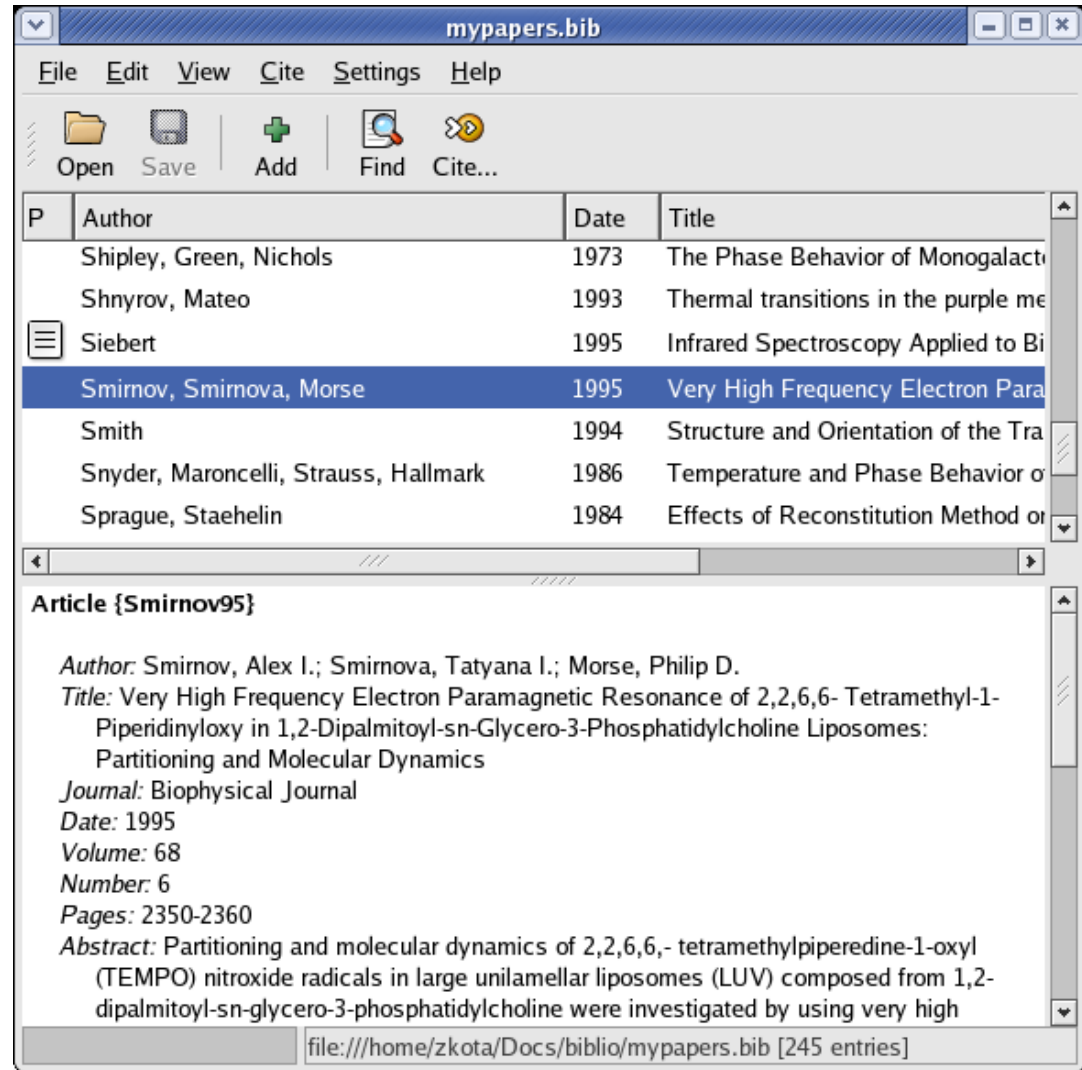
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Pybliographer

Linux

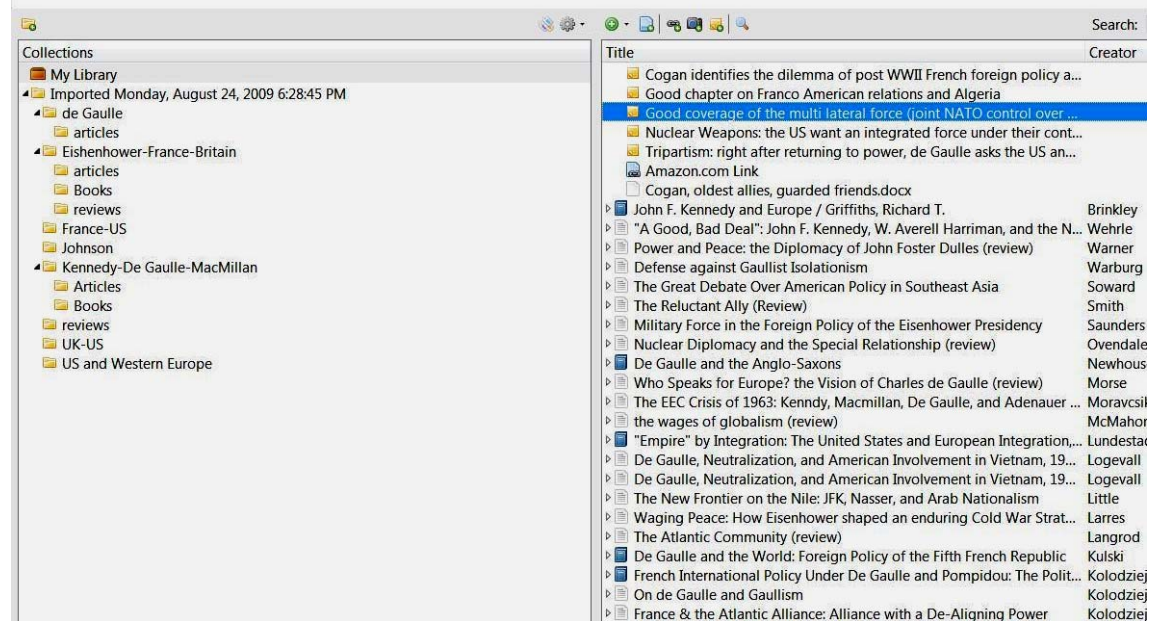
- + Interface for bibtex
- + Customizable, searchable interface
- + Integrates with Lyx, Kile, OpenOffice
- + open source (free)
- Preserves data entry inconsistencies (author: J. Doe vs. Jane Doe)
- Feature set is basic; not as impressive as EndNote



Zotero

All platform, Firefox plugin

- + Integrates the actual article with citation
- + Easy to import citations from web
- Write and cite is weak
- slow



Staying Organized

1. Ideas
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3 - Experiments

- What's at stake?

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

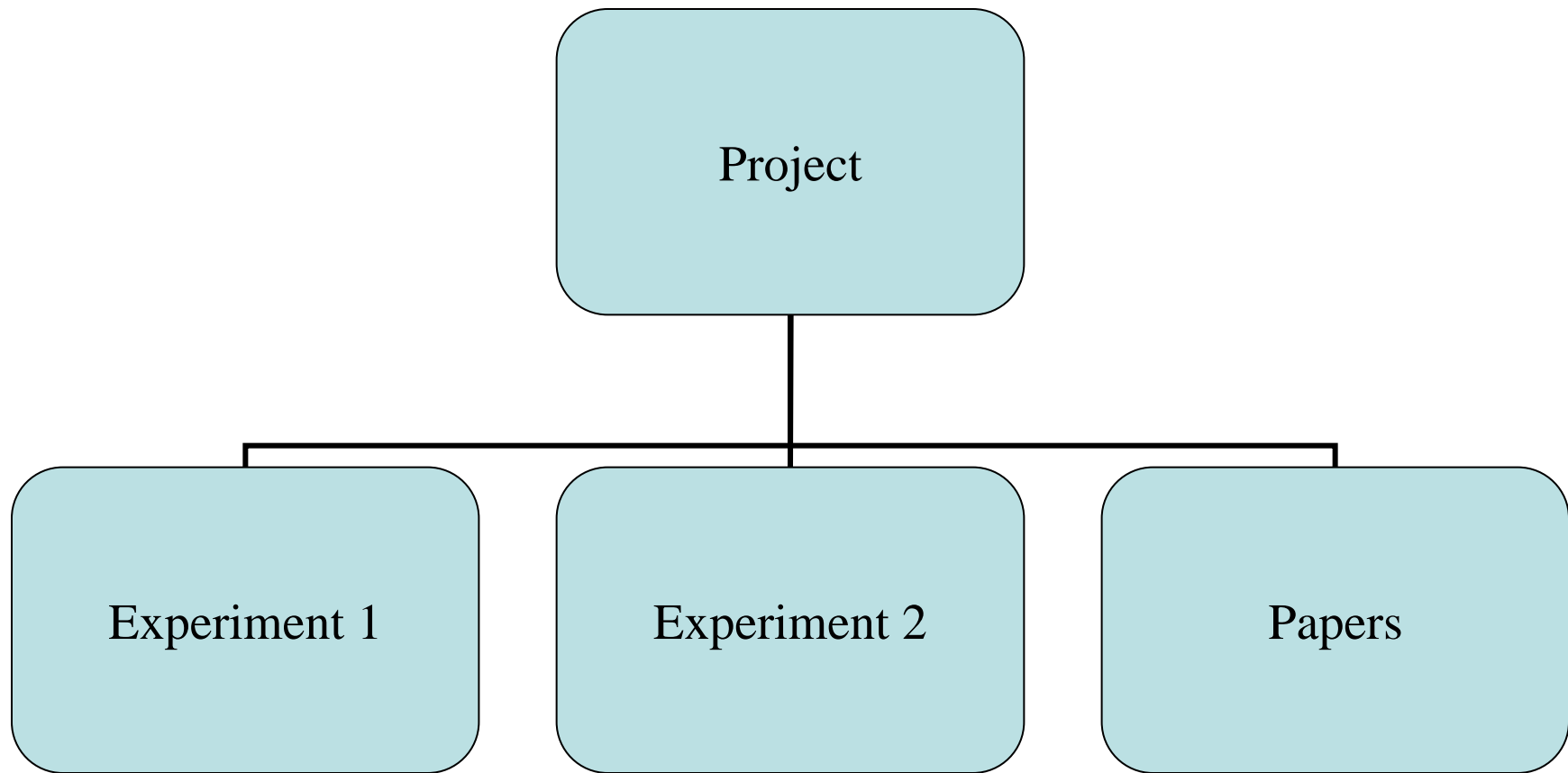
Time – You're revisiting an old piece of code, but because you didn't comment much of it, are spending a lot of time trying to understand it.

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

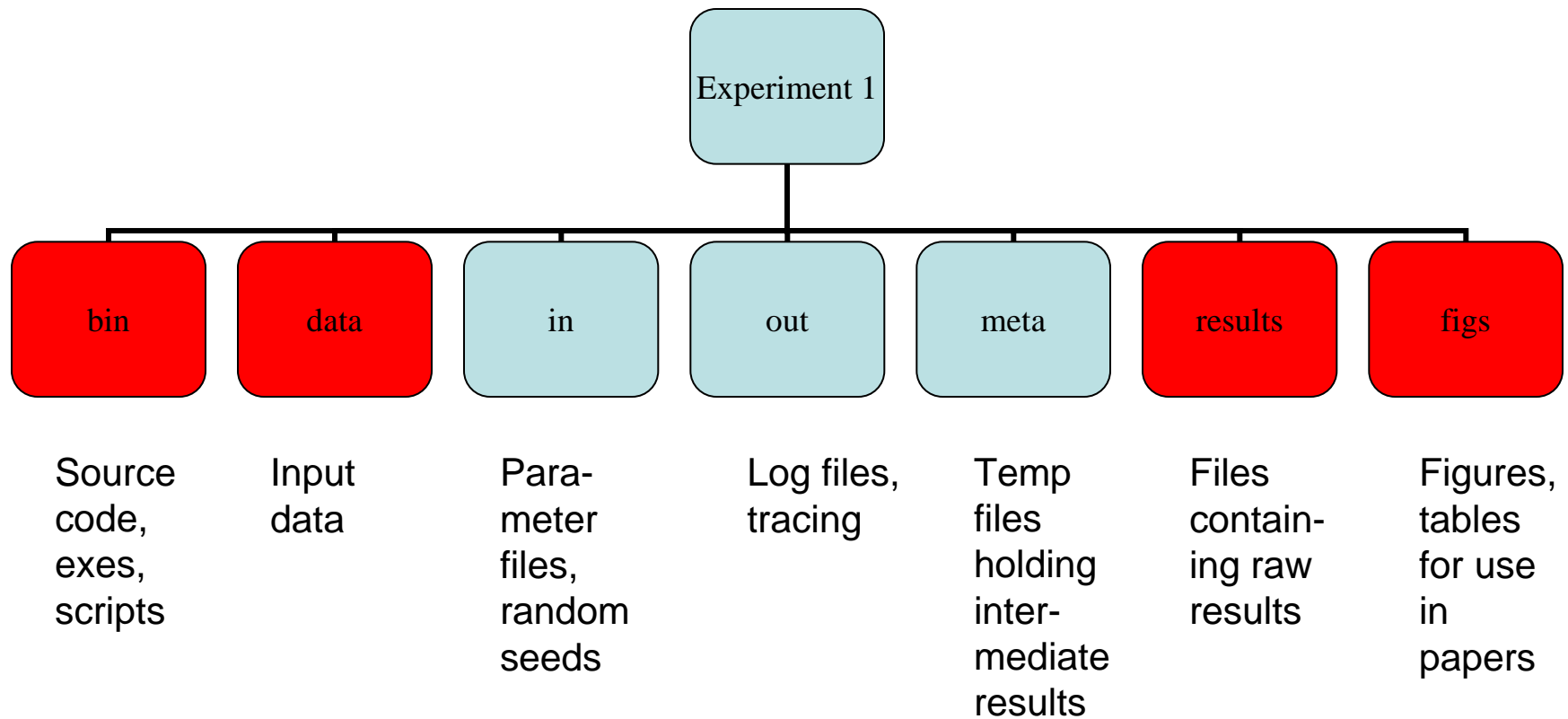
3 - Experiments

- 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



3 - Experiments



 CVS'd items

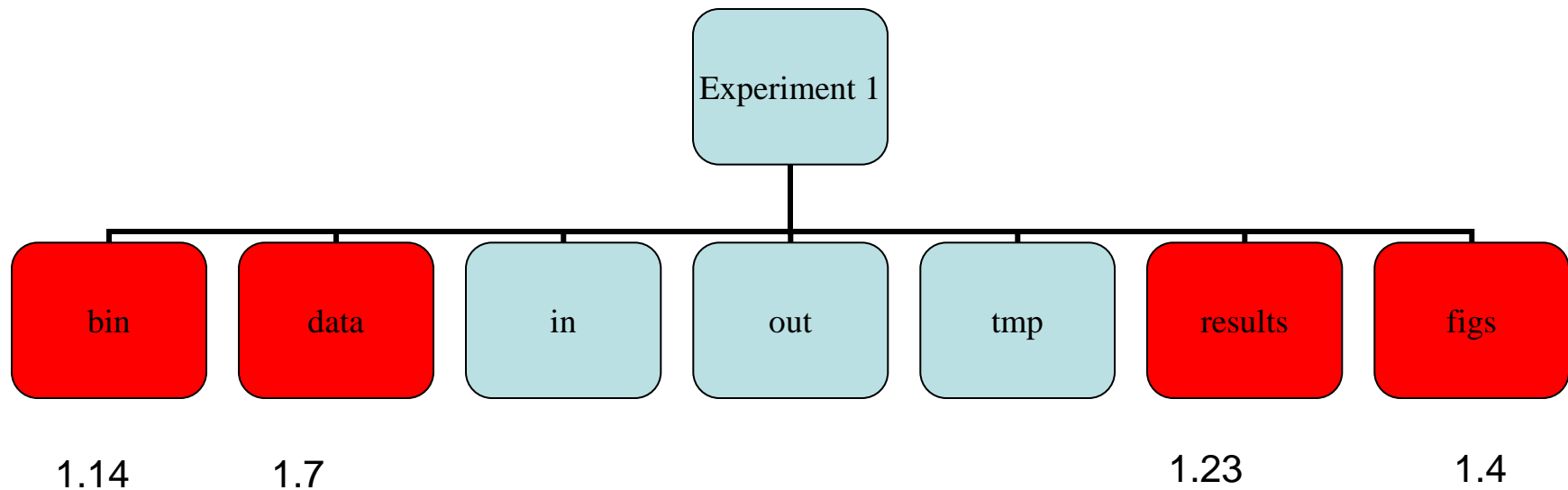
3 – Experiments

- 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



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

Staying Organized

1. Ideas
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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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