Welcome!

Rob Fish
IW Coordinator
rfish@cs.princeton.edu
206 Computer Science

Tom Funkhouser
IW Coordinator
funk@cs.princeton.edu
422 Computer Science

Colleen Kenny-McGinley
Undergrad Coordinator
ckenny@cs.princeton.edu
210 Computer Science
Outline for This Session

• Overview of independent work in COS
• Details of important steps and deadlines
• Pointers to where to get more info and help
Let’s get started ...
What Is Independent Work?

Individual project to study a novel idea in depth

- Novel algorithm
- Novel system design
- Novel problem formulation
- Novel benchmark suite
- Novel proof of a theorem
- Novel survey of a research area
- Novel ...
Why Do Independent Work?

Study a topic in depth
- Dive into much more detail than could in a course

Learn important skills
- Technical writing, speaking, project management

Work closely with faculty
- Meet weekly, get advice, meet their dogs, etc.

Do something interesting to talk about in ...
- Grad applications, job interviews, etc.

Fun!!!
Types of Independent Work

One semester project
- All AB juniors and some BSE juniors/seniors
- Project designed for one semester, but can be followed by related project in later semester
- IW seminar or individual advising

Two-semester projects or theses
- All AB seniors and some BSEs
- Project designed for full year
- Individual advising
IW Seminars

Same as one semester projects, but students work on related topics and meet with adviser together

- Enables collaborative projects
- Enables sharing of infrastructure
- Enables feedback to/from other students

Targeted at first-time IW students

- Provides more help on how to choose good projects, how to manage time, how to design talks, how to write papers, etc.
Important Steps and Deadlines

One semester projects:

- **Feb 23:** Written project proposal
- **Mar 22:** Checkpoint form
- **Apr 6:** “How to Give an IW Talk” session*
- **Apr 13:** “How to Write an IW Paper” session*
- **Apr 18-22:** Oral presentation
- **Apr 29:** Written final report
- **May 5-6:** Poster session

* at 7:30PM in CS 105
Important Steps and Deadlines

Two semester projects and theses:

- Feb 5: Second reader form
- Mar 1: Draft paper
- Apr 6: “How to Give an IW Talk” session*
- Apr 13: “How to Write an IW Paper” session*
- Apr 18-22: Oral presentation
- Apr 29: Written final report
- May 5-6: Poster session (optional)

* at 7:30PM in CS 105
Questions so far?
On to the specifics ....
Important Steps and Deadlines

One semester projects:

- Feb 23: Written project proposal
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* at 7:30PM in CS 105
Written Project Proposal

Submit written description of your project plan

Logistics:

- Due Feb 23rd
- 1-2 page paper
- Submit PDF document via CS dropbox
Written Project Proposal

- **Motivation and goal**
  
  “The goal of my project is ...”

- **Related Work**
  
  Survey of prior work with similar goals

- **Approach**
  
  Key novel idea

- **Implementation plan**
  
  Things you plan to implement. How you plan to do it.

- **Evaluation plan**
  
Write short summaries of what’s done in first half and what’s planned for second half

Logistics:
- Due Mar 22\textsuperscript{nd} (right after spring break)
- Write two paragraphs
- Get feedback from adviser
- Submit via online web form
Oral Presentation

Give an 9 minute talk about what you’ve done over the whole semester

Logistics:

- Apr 18-22\textsuperscript{nd} (last week of classes)
- Attend “How to Give an IW Talk” on Apr 6\textsuperscript{th}
- Sign up for one hour time slot via WASS
- 5-6 talks per hour
- Submit slides via CS dropbox the night before
- Give your talk, watch others, provide feedback
Oral Presentation

- **Motivation and goal**
  
  “The goal of my project is …”

- **Related Work**
  
  Survey of prior work with similar goals

- **Approach**
  
  Key novel idea

- **Implementation**
  
  Things you implemented. How you did it? What remains to be done.

- **Evaluation**
  

- **Discussion**
  
  Conclusions. Limitations. Future work.
Written Final Report

Submit a written description of your project, including results and conclusions

Logistics:

- Due Apr 29\textsuperscript{th}
- Attend “How to Write an IW Paper” on Apr 6\textsuperscript{th}
- Submit PDF report via CS dropbox
- For one semester projects:
  - 20-25 pages + appendix
- For two semester projects and theses:
  - 40-50 pages + appendix
Written Final Report

- Motivation and goal
  “The goal of my project is ...”

- Related Work
  Survey of prior work with similar goals

- Approach
  Key novel idea

- Implementation
  Things you implemented. How you did it? What remains to be done.

- Evaluation

- Discussion
  Conclusions. Limitations. Future work.
Poster Session

Present a poster describing your project to other students, faculty, and visitors

Logistics:

- In Convocation Room on May 5-6th
- Submit PDF posters via CS dropbox
- Present posters on 4x4 bulletin boards
- Live demos, videos, props, etc.
- Best poster awards!
Poster Session
Important Steps and Deadlines

Two semester projects and theses:

- Feb 5: Second reader form
- Mar 1: Draft paper
- Apr 6: “How to Give an IW Talk” session*
- Apr 13: “How to Write an IW Paper” session*
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* at 7:30PM in CS 105
Second Reader Form

Select a member of the Princeton faculty to be the “second reader” (for thesis projects only)

Logistics:

- Due Feb 5th (Friday)
- Link to form accessible on IW portal
  https://iw.cs.princeton.edu/portal/
Second Reader Form

Please refer to independent work website for more information about this form.

Name

Advisor

Project title

Who will be your second reader?
Note that your second reader will receive an email letting them know you selected them.

My second reader is not listed above

I confirm that my second reader has agreed to be a second reader for my thesis (you must get confirmation before submitting this form)

Submit

https://iw.cs.princeton.edu/portal/
Draft Paper

Submit a draft for at least the first few sections of written report (two-semester and thesis projects)

Logistics:
- Due Mar 1st
- At least 4-5 pages single-spaced
- Submit PDF file via CS dropbox
Some more logistics ....
IW Portal

https://iw.cs.princeton.edu/portal/
Funding

Project-related expenses:
- Unusual hardware, software, data sets, etc.

Available funds:
- School of Engineering and Applied Science
  Expect email soliciting proposals soon
  Support up to $500 or so

- Student Activities Funding Engine (SAFE)
Collaboration

“Independent work”

- Every student must do his/her own project

Collaboration

- Multiple IW projects can be synergistically part of a larger effort, either with other IW students or grad students
- Each student must carve out a distinct part with a clear goal, novel idea, evaluation methodology, etc.
- Each student must submit his/her own work
- Each student will be graded separately
Grading

Grades will depend upon:

- **Student initiative and contribution**: the creativity and originality of student ideas
- **Student progress**: content, amount of work accomplished to date, clarity and polish of presentations
- **Student presentation and paper**: the content, eloquence, organization and clarity

Majority of grade will depend upon research work

- But, poor presentation and/or poster, and missing checkpoints will also have an impact
Grading

A-level
- New contribution – interesting, creative
- Solid execution and results – refined and tested
- Excellent papers, talks, and posters – scholarly, thorough

B-level
- Not-so-innovative contribution – variant of previous work
- Working execution and results – not fully refined and tested
- Complete papers, talks, and posters – limited insights

C-level
- Not innovative
- Unfinished or unworking implementation
- Report looks like workbook or lab report

D-level
- Nothing interesting attempted, nothing gained
- Report is stream of consciousness
Common Mistakes

Delay project planning until last minute
■ Get started right away

Postpone meetings with your adviser
■ Try to meet once/week, even if it’s a brief meeting

Allow yourself to get stuck
■ Talk to your adviser; don’t avoid them when you are stuck

Put off work until the end of the semester
■ Work consistently throughout the semester

Prepare papers and presentations at the last minute
■ Iteratively refine. Get feedback from your adviser.
If You’re Having Trouble...

Let us know...

Examples:

- Expect to miss a deadline
- Problems with your adviser
- Problems with your project
- Other factors in your life

If you tell us early, we might be able to help you

- We can direct you to right person

Fixing problems post facto may be much harder

- Often involves Deans, etc.
Who/What You Can Ask

Adviser
- Anything research related
- Not: can I skip the project proposal or poster or write-up

IW Coordinator (Profs Fish and Funkhouser)
- Anything about mandatory requirements
- Not: is this research interesting

Undergrad coordinator (Colleen Kenny-McGinley)
- Anything about dates, forms, funding, etc
- Not: can you give me an extension
How to Ask Questions

Email

- iwcoord@cs.Princeton.edu
- Tell/ask IW coordinators questions about changes, problems, amazing achievements, etc.

Piazza

- Ask IW staff and other students questions about logistics, advice, toolkits, data sets, etc.
Where to Find More Information

Web site:

- Important steps and deadlines
- Guidelines and useful information

These slides are linked from there
That pretty-much covers it. Let’s summarize the key points ....
My Thoughts on IW at Princeton

This is your chance to do an in-depth project on a novel topic of your own choosing

- It doesn’t get better than this
- It’s probably why you came to Princeton
- It’s certainly what you’ll most remember from your academics at Princeton

So, take the initiative and be awesome!
What to Do Today?

Read everything on the web site

- Read through the guidelines and useful information
- Take note of important deadlines
- Schedule weekly meetings with your adviser
What to Do In February?

Work diligently to develop your project plan

- Work hard to define a specific goal
- Understand all related work
- Articulate what makes your project novel
- Know what software and data you will use
- Have a good idea of what you need to implement
- Have a specific plan to evaluate your results

Write your project proposal early, get feedback, and refine multiple times
But the Semester Just Started!

The first few weeks is really important ...

• A good project plan is the key to success
• It takes time to understand related work, relevant software, and available data sets
• It takes iteration and refinement (multiple meetings with your adviser) to define a good project goal and novel approach
• Working hard in the first few weeks greatly reduces the chances of ending up with a weak project
OK, that’s it.
Thanks!!!