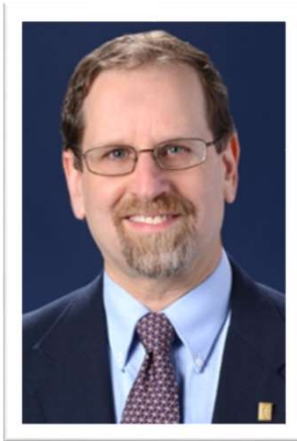




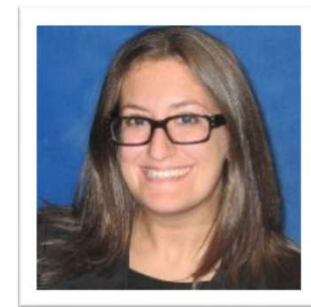
WELCOME!



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OUTLINE FOR THIS SESSION

- Overview of COS independent work
- Details of important steps and deadlines
- Resources for more information and help



**LET'S GET
STARTED!**

What Is Independent Work?

■ Independent Work (IW):
An individual project to study an idea in depth.

■ Examples:

- ▷ Algorithm
- ▷ System design
- ▷ Problem formulation
- ▷ Benchmark suite
- ▷ Proof of a theorem
- ▷ Application
- ▷ Investigate a dataset
- ▷ Etc...

Why Do Independent Work?

- Study a topic in depth
 - ▷ Dive into much more detail than is possible in a course
- Learn important skills
 - ▷ Technical writing, speaking, project management
- Work closely with faculty
 - ▷ Meet weekly, get advice, get to know them, etc.
- Do something interesting to talk about in...
 - ▷ Grad applications, job interviews, etc.
- Have fun!!



Types of Independent Work

■ One-Term Project

- ▷ All AB juniors and some BSE juniors/seniors
- ▷ Designed for one term, but can be followed by a related project in a later term
- ▷ IW seminar, or one-on-one/individual advising

■ Two-Term/Thesis

- ▷ All AB seniors and some BSE juniors/seniors
- ▷ Designed for a full year
- ▷ One-on-one/individual advising



IW Seminars

- Same as one-term projects, but students work on related topics and meet with an advisor 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: Spring One-Term Projects

- Mon Feb 17: SEAS Funding Deadline (open to all COS IW students)
- February 23: Written Project Proposal due, 11:59pm
- March 8: Checkpoint Form due, 11:59pm
- March 30–April 3: WASE Sign up for an Oral Presentation Time Slot the week of April 20-24 (**First-time BSE, non-seminar students, only)
- March 31: Attend How to Give an IW Talk, 4:30pm, CS 105
- April 14: Attend How to Write an IW Paper, 4:30pm, CS 105
- April 19: Oral Presentation Slides due, 11:59pm
- April 20–24: Give In-Person Oral Presentation
- May 1: Written Final Report due, 11:59pm

<https://www.cs.princeton.edu/ugrad/independent-work/important-steps-and-deadlines>



QUESTIONS SO FAR?



Onto the specifics...



Written Project Proposals (All IW Students)

- Submit a written description of your project plan
- Logistics:
 - ▷ Due February 23 at 11:59pm
 - ▷ 1-2 page paper
 - ▷ Submit PDF document via CS dropbox



Written Project Proposal (Continued)

■ 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

■ Evaluation Plan

- ▶ Experiment design, data, metrics, comparisons



Checkpoint Form (All IW Students)

- Write a short summary of what is done in the first half, and what is planned for the second half
- Logistics:
 - ▷ Due March 8 at 11:59pm
 - ▷ Write two paragraphs
 - ▷ Get feedback from advisor
 - ▷ Submit via IW portal



Checkpoint Form

Please refer to [independent work website](#) for more information about this form.

Name*

Advisor*

Project title*

Approximate number of meetings with your advisor*

Progress report*

Progress to date:

Current difficulties:

Next steps:

Submit

Progress to date:

Current difficulties:

Next steps:



Oral Presentation (One-Term Students)

- Give a nine-minute talk about what you've done over the whole semester
- Logistics:
 - ▷ Attend “How to Give an IW Talk” on March 31 at 4:30pm in CS 105
 - ▷ Non-seminar students: Sign up for one-hour time slot via WASE, week of March 30-April 3
 - ▷ Seminar students: Complete your talk within your IW seminar

Oral Presentation

■ Logistics (continued):

- ▶ Submit slides via CS dropbox by April 19 at 11:59pm
 - ▶ Note: You may edit and re-submit your slides until the night before your presentation, but you must submit a FULL slide deck by the deadline above.
- ▶ Talks are given in either an IW seminar or in a session with the IW Coordinators during the week of April 20-24
- ▶ Give your talk, watch others, provide feedback

Oral Presentation (Continued)

- 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 implemented. How did you do it? What remains to be done?
- Evaluation
 - ▷ Experiment design, data, metrics, comparisons, qualitative results, quantitative results, further results needed
- Discussion
 - ▷ Conclusions, limitations, future work



Written Final Report

- Submit a written description of your project, including results and conclusions
 - ▷ Due May 1 by 11:59pm
 - ▷ Attend “How to Write an IW Paper” on April 14 at 4:30pm in CS 105
 - ▷ Submit PDF via CS dropbox
 - ▷ 20-25 pages, double-spaced, plus appendix



Written Final Report (Continued)

- 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 built. How did you do it? ~~What remains to be done?~~
- Evaluation
 - ▷ Experiment design, data, metrics, comparisons, qualitative results, quantitative results, ~~further results needed~~
- Discussion
 - ▷ Conclusions, limitations, future work

Additional Important Information



<https://iw.cs.princeton.edu/portal>

This website is used to collect required form submissions and track your Dropbox submissions for your independent work with the Computer Science Department.
Please review the [independent work important dates and deadlines](#) if you have not yet done so. This page details the specific dates the various assignments and forms are due.

Spring IW Sign-Up

Please complete the sign-up form for the Spring semester if you have not done so already.

[▶ Click to complete form.](#)

Manage your independent work

Spring 2020

Advisor	Fish, Rob
Written Proposal	✓ Submitted
Checkpoint Form	✓ Submitted (View Feedback)
Oral Presentation Slides	✓ Submitted (View Feedback)
Written Final Report	✓ Submitted
Poster	✓ Submitted (View Feedback)



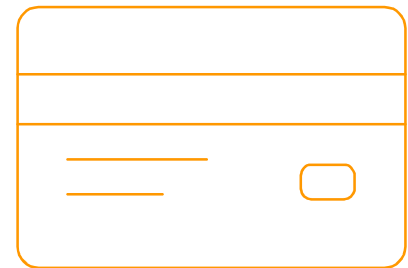
Funding

■ Project-related expenses:

- ▶ Unusual hardware, software, data sets, etc.

■ Available funds:

- ▶ School of Engineering and Applied Science
 - ▶ Due in person on February 17 by 5:00pm
 - ▶ Application requires an adviser signature, don't procrastinate!
 - ▶ Support up to ~\$500
 - ▶ Open to ANY computer science student
- ▶ Student Activities Funding Engine (SAFE)
 - ▶ <http://www.princeton.edu/studentfunding>





Collaboration

■ “INDEPENDENT” Work

- ▷ Every student must do their 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, evaluation methodology, etc.
- ▷ Each student must submit their 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: content, eloquence, organization and clarity

■ Majority of grade will depend upon quality of work

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



Grading (Continued)

A-level

- ▶ Clear contribution – interesting, creative
- ▶ Solid execution and results – refined and tested
- ▶ Excellent talks, papers – thoughtful, thorough
- ▶ Student has taken initiative and led project

B-level

- ▶ Not-so-innovative – possibly obvious from previous work
- ▶ Working execution and results – not fully refined and tested
- ▶ Complete papers, talks, and posters – limited insights



Grading (Continued)

■ C-level

- ▷ Not innovative
- ▷ Unfinished or not working implementation
- ▷ Report looks like workbook or lab report

■ D-level

- ▷ Nothing interesting attempted, nothing gained
- ▷ Report is stream of consciousness



Common Mistakes

- ⊘ Mistake: Delaying project planning until last minute
 - ▷ Instead: Get started right away
- ⊘ Mistake: Postponing meetings with your advisor
 - ▷ Instead: Try to meet once a week, even if it's a brief meeting
- ⊘ Mistake: Allowing yourself to get stuck
 - ▷ Instead: Talk to your advisor; don't avoid them when you are stuck
 - ▷ TA's are assigned to every seminar. Use them!



Common Mistakes (continued)

- ⊘ Mistake: Putting off work until the end of the semester
 - ▷ Instead: Work consistently during the semester (10 hours per week, minimum)
- ⊘ Mistake: Preparing papers and presentations at the last minute
 - ▷ Instead: Iteratively refine. Get feedback from your advisor.



If You're Having Trouble...

Examples:

- ▷ If you expect to miss a deadline
- ▷ If you have problems with your advisor
- ▷ If you have problems with your project
- ▷ Other factors in your life (e.g. illness, death in the family, etc.)

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

- ▷ We can direct you to the right person

Fixing problems post facto may be much harder

- ▷ Often involves Deans, etc.



LET US
KNOW!

A large orange speech bubble with a white background, containing the text 'LET US KNOW!' in bold, dark blue, sans-serif capital letters.



Who/What You Can Ask

■ Your Advisor:

- ▶ Anything research related
- ▶ Not: “Can I skip the project proposal or final paper?”

■ IW Coordinators (Dr. Fish, Finkelstein)

- ▶ Anything about mandatory requirements
- ▶ Not: “Is this research interesting?”

■ IW Administrator (Mikki Hornstein)

- ▶ Anything about dates, forms, funding, etc.
- ▶ Not: “Can you give me an extension?”

How to Ask Questions

■ Piazza – Primary Resource

- ▶ <http://piazza.com/princeton/spring2020/cosiw>
- ▶ Ask IW staff and other students questions about logistics, advice, toolkits, data sets, etc.



Where to Find More Information

■ IW Website:

- ▷ <http://www.cs.princeton.edu/ugrad/independent-work>
 - ▷ Important Steps and Deadlines
 - ▷ Guidelines and Useful Information

■ Note: These slides will also be available on the website



That pretty much covers it.

Let's summarize the key points...





Immediate Next Steps

- Look over the IW website, and be aware of important upcoming deadlines
 - ▷ Important Steps and Deadlines
 - ▷ Guidelines and Useful Information
- One-on-one students: Schedule weekly meetings with your advisor



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.



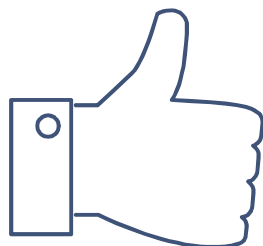
But the Term Just Started!

- The first few weeks are really important...
 - ▷ A good project plan is key to success
 - ▷ It takes time to understand related work, relevant software, and available data sets
 - ▷ It take iteration and refinement (multiple meetings with your advisor) to define a god project goal and novel approach
 - ▷ Working hard in the first few weeks greatly reduces the chances of ending up with a weak project



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 remember most from your academic career at Princeton
- Take the initiative and BE AWESOME!



THANKS!

Any questions?