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 webiste](#) for more information about this form.

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<td>Fish, Robert</td>
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Submit
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
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
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
https://iw.cs.princeton.edu/portal
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](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!
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

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

- IW Website:
  - 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 takes iteration and refinement (multiple meetings with your advisor) 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
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?