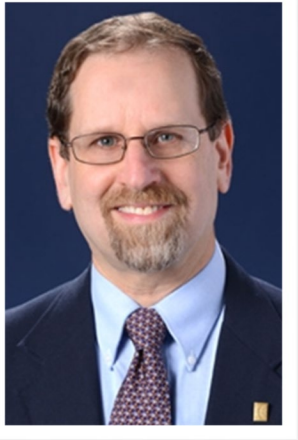
GETTING STARTED: COMPUTER SCIENCE INDEPENDENT WORK

SPRING 2026

DR. ROBERT FISH, DR. DAVID AUGUST,
& MIKKI HORNSTEIN

WELCOME!



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OUTLINE FOR THIS SESSION

- Outstanding IW Awards – Fall 2025
- Overview of independent work in Computer Science
- Details of important steps and deadlines
- Resources for more information and help

CONGRATULATIONS!

Exemplary Fall 2025 Independent Work

Jeremy Bao, BSE'27
Calibrating Reasoning Models to Know When They Don't Know
Adviser: Anirudha Majamdar

Stefan Gjaja, BSE'26
prompt.ly: Prompt better, think better.
Adviser: Robert Fish

Diya Hundiwala, BSE'27
AnchorNote: Exploring Gesture- and Speech-Based Spatial Sticky Notes for Collaboration in Augmented Reality
Adviser: Andrés Monroy-Hernández

Abdur-Raheem Idowu, BSE'26
On the Practicality of Real-World Wi-Fi-Based Video Fingerprinting
Adviser: Maria Apostolaki

Ivan Amado Krsul Portugal, BSE'26
Handlebar: A Platform for Ethical Mobile Screen Data Research
Adviser: Andrés Monroy-Hernández

Rafael Moschopoulos, BSE'27
STU-NO: Solving Partial Differential Equations with Spectral Filtering
Adviser: Elad Hazan

Addison Wu, BSE'27
Are Large Language Models Sensitive to the Motives Behind Communication?
Adviser: Tom Griffiths

Annika Yeh, BSE'26
Deep Learning for Archival Aerial Photography: Mapping Long-Term Socioenvironmental Change in Namibia
Adviser: Xiaoyan Li

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, Spring

- Spring 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.

IW Seminars

- Same as one-on-one 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 2026 Projects

February 12:	Written Project Proposal due in IW portal, 11:59pm
February 13:	SEAS online IW/thesis funding application due, 5:00pm
March 5:	Checkpoint Form due, 11:59pm
March 17:	Attend How to Give an IW Talk information session
March 24:	Attend How to Write an IW Paper information session
April 12:	Oral Presentation Slides & Link to Video due in IW portal, 11:59pm
April 26:	Written Final Report due in IW portal, 11:59pm

https://www.cs.princeton.edu/ugrad/calendar-and-requirements

QUESTIONS SO FAR?

Onto the specifics…

Written Project Proposals

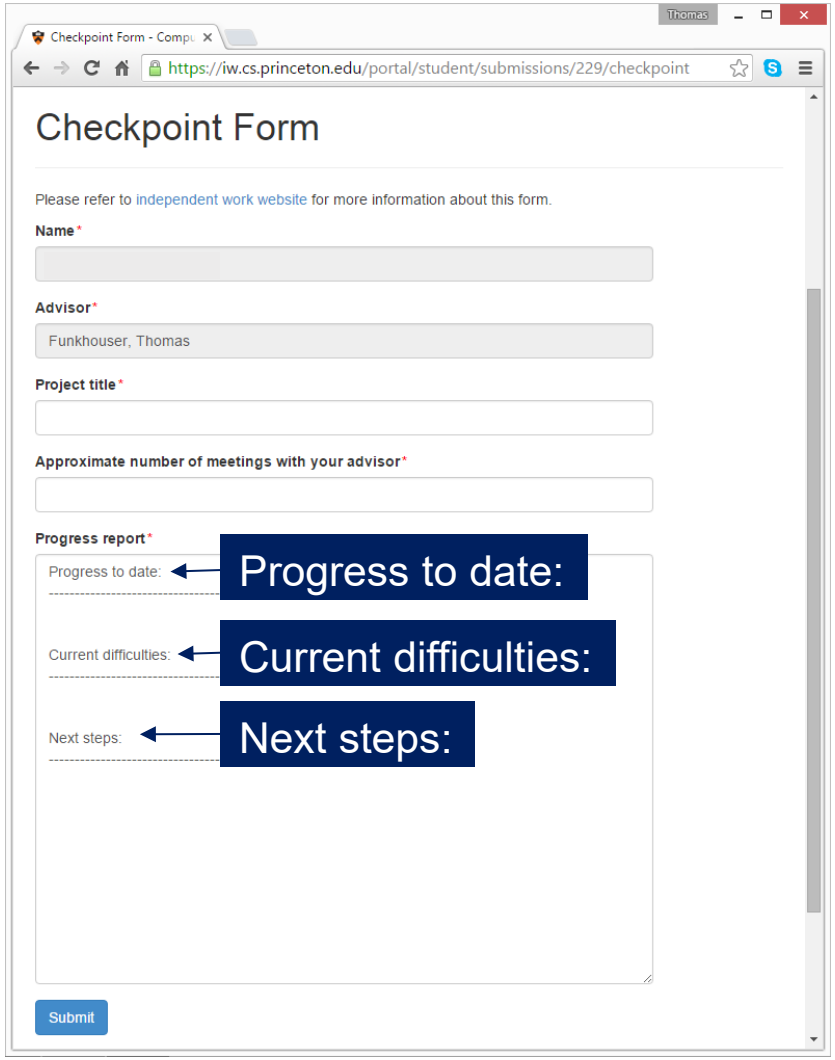
- Submit a written description of your project plan
- Logistics:
  - Due February 12, 11:59pm Eastern
  - 1-2 page paper
  - Submit PDF document via IW portal

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

- Write a short summary of what is done in the first half, and what is planned for the second half
- Logistics:
  - Due March 5, 11:59pm EDT
  - Write two-three paragraphs
  - Submit via IW portal
  - Get feedback from advisor


Thomas
Checkpoint Form - Compu
https://iw.cs.princeton.edu/portal/student/submissions/229/checkpoint
Checkpoint Form
Please refer to independent work website for more information about this form.
Name*
Advisor*
Funkhouser, Thomas
Project title*
Approximate number of meetings with your advisor*
Progress report*
Progress to date:
Current difficulties:
Next steps:
Progress to date:
Current difficulties:
Next steps:
Submit

Oral Presentation
(Spring-Term IW Students Only)

- Give a **nine-minute** talk about what you've done over the whole term.
- Logistics:
  - Attend "How to Give an IW Talk" on March 17.
  - Submit slides and video link via IW portal by April 12 at 11:59pm.
    - Note: You must submit your FULL slide deck by the deadline above.

Oral Presentation (Continued)

- Video-recorded oral presentations
  - Record your oral presentation via Zoom, or
  - Select another way to record your oral presentation (Loom, etc.)
- Save your recording either on Zoom or in Google Drive
  - Submit a **link** to your recording to the IW portal
- Submit a pdf of your slides to the IW portal
- Seminar students: your instructor may ask you to practice or present in your group meeting, as well
- One-on-one students: your adviser may ask you to present to their research group, as well

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

Logistics

- Due April 26 by 11:59pm
- Attend “How to Write an IW Paper” on March 24
- Submit PDF via IW portal
- 20-25 pages, double-spaced, plus appendix

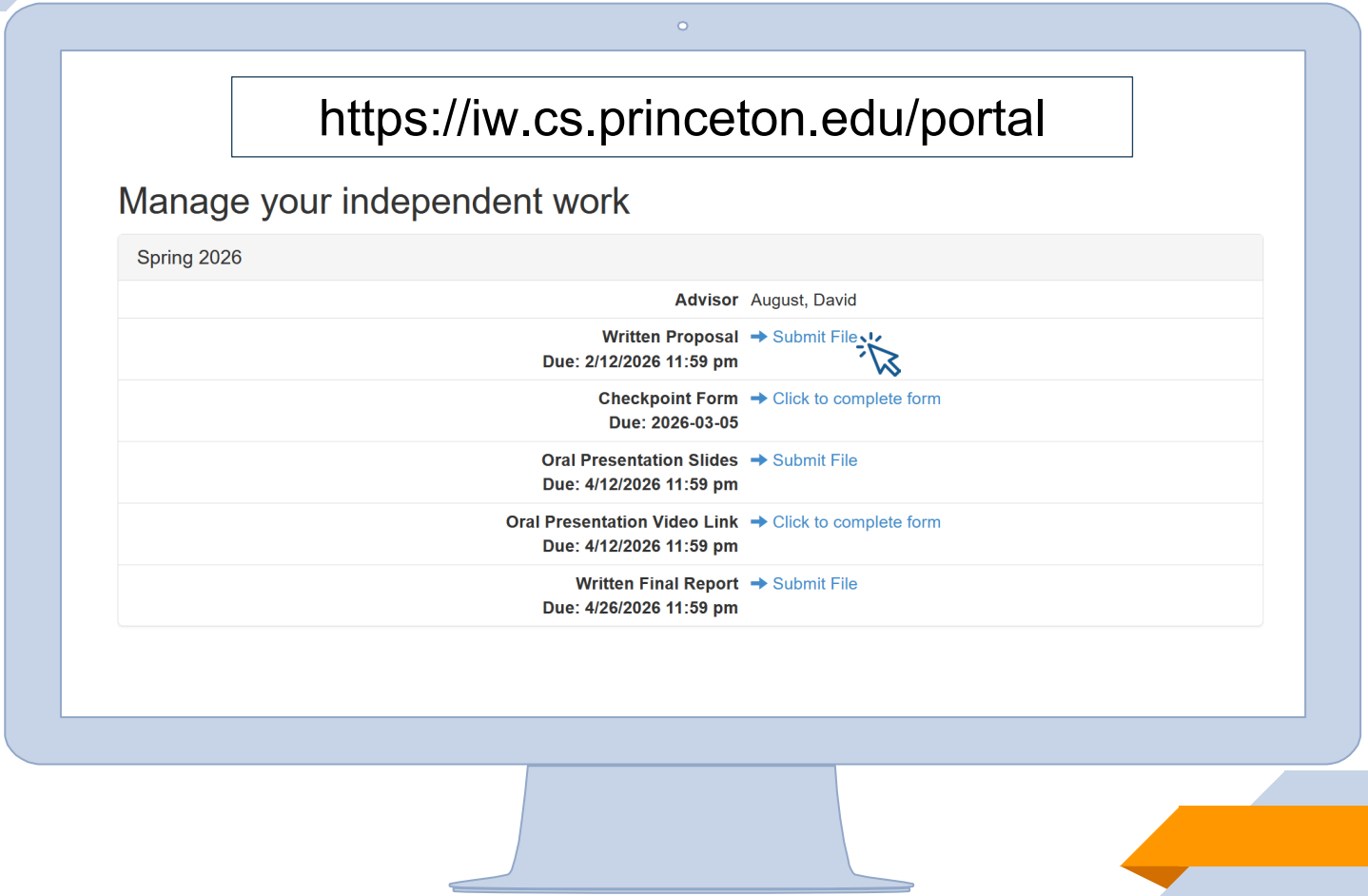
Final papers submitted after 11:59pm on the due date will be assigned a 1/3 grade deduction.

Written Final Report (Continued)

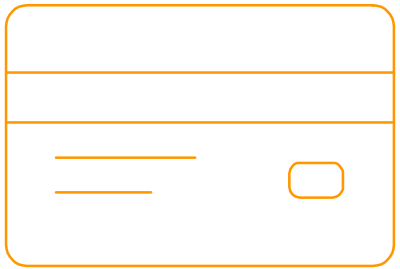
- Motivation and goal
  - “The goal of my project is…”
- Related work
  - Survey of prior work with similar goals
- Approach
  - Key novel idea
- Implementation
  - Things you built. How did you do it? ~~What remains to be done?~~
- Evaluation
  - Experiment design, data, metrics, comparisons, qualitative results, quantitative results, ~~further results needed~~
- Discussion
  - Conclusions, limitations, future work

Additional Important Information

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



Funding



- Project-related expenses:
  - Unusual hardware, software, data sets, etc.
- Available funds:
  - School of Engineering and Applied Science: Application due February 13 by 5:00pm
    - Requires an adviser signature, **don't procrastinate!**
  - Support up to ~$500 or more with justification ($300 max for cloud computing services. Again, more with justification.)
  - 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, novel idea, evaluation methodology, etc.
  - Each student must submit their own work
  - Each student will be graded separately

Grading

- **IW must be taken for a grade.**
- Grades are recommended by instructor, confirmed by IW Coordinators

- Grades will depend upon:
  - Student initiative and contribution: the creativity and originality of student ideas and/or degree of technical challenge undertaken
  - Student progress: content, amount of work accomplished to date, clarity and polish of presentations
  - Student presentation and paper: content, eloquence, organization and clarity

Grading (Continued)

- Majority of grade will depend upon quality of work and presentation.
  - Poor presentation and/or missing checkpoints will also have an impact.
- **Final papers submitted after 11:59pm on the due date will be assigned a 1/3 grade deduction.**

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 and talks – 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.
  - TAs are usually assigned to every seminar. Use them!

Common Mistakes (Continued)

- Mistake: Putting off work until the end of the term.
  - Instead: Work consistently during the term (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.

Who/What You Can Ask

- Your Advisor:
  - Anything research related
  - Not: “Can I skip the project proposal or final paper?”
- IW Coordinators (Dr. Fish, Dr. August)
  - 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

- Canvas/Ed – Primary Resource
  - https://edstem.org/us/courses/94936/discussion
  - Ask IW staff and other students questions about logistics, advice, toolkits, data sets, etc.
- Email Mikki
  - mhornstein (@princeton.edu)

Where to Find More Information

- IW Website:
  - https://www.cs.princeton.edu/ugrad/independent-work-thesis
    - Calendar and Requirements
- IW Handbooks:
  - AB Handbook: https://csguide.cs.princeton.edu/sites/default/files/2025-08/COS_AB_IW_Handbook_2025-26.pdf
  - BSE Handbook: https://csguide.cs.princeton.edu/sites/default/files/2025-08/COS_BSE_IW_Handbook_2025-26.pdf

Note: These slides will also be available on the website and Canvas

That pretty much covers it.

Let’s summarize the key points…

Immediate Next Steps

- Look over the IW website, IW handbooks, and be aware of important upcoming deadlines.
- One-on-one students: Schedule weekly meetings with your advisor.
- Seminar students: Attend your seminar meetings.

What to Do in January/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?