LECTURE XII

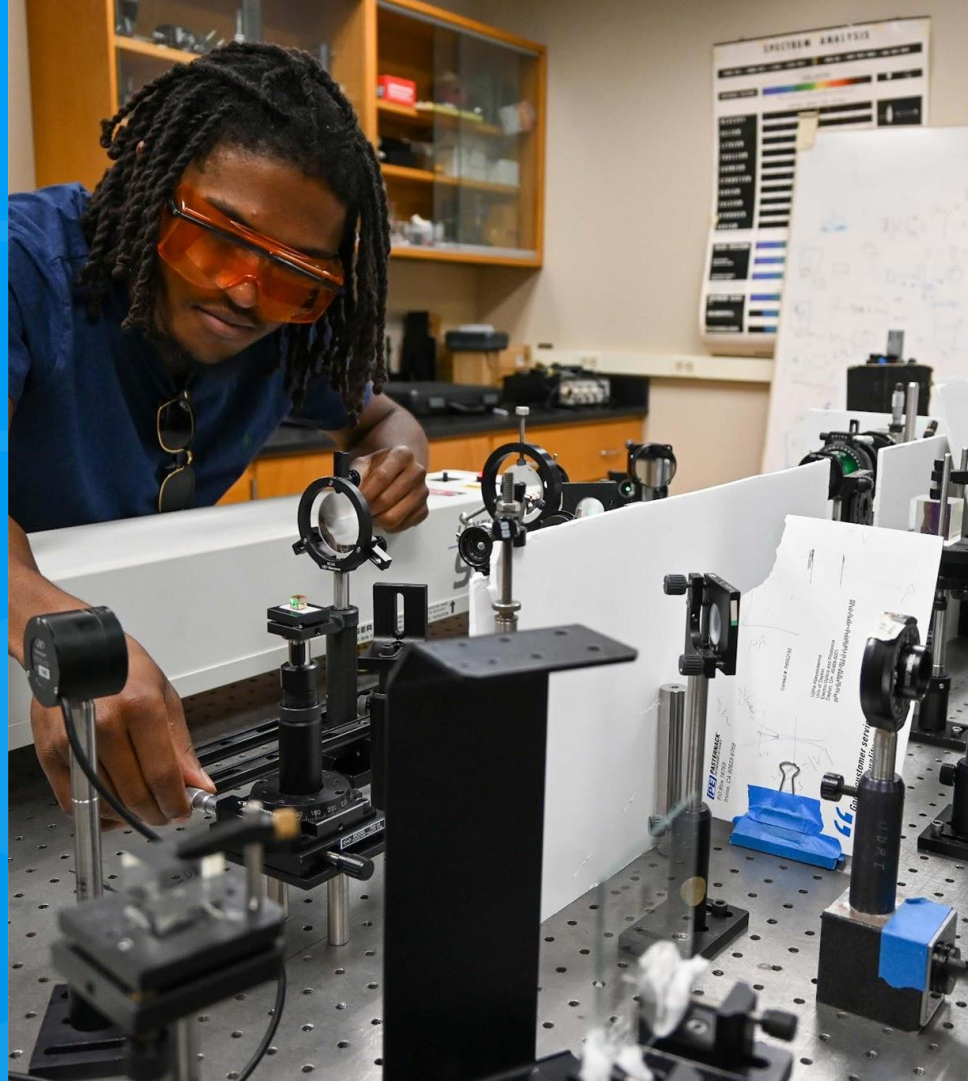
Career Development

Choosing Your Early Career Path

- There **two common paths** for students completing their undergraduate degree:
  - Pursuing a **Master's degree or PhD** (grad school)
  - Acquiring a job in **Industry**
- We will discuss the pathways separately, highlighting important components in accomplishing each…

Graduate Pathway

Master’s Degrees and PhDs



Is Graduate School Right for Me?

- **Do you have a specialization in mind?**
  - If you don't, consider spending time in industry to first learn more about your interests
- **PhD or Master's Degree?**
  - **Master's programs** tend to be more **career-oriented** and allow **further specialization** into a field (1-3 years)
  - **PhD programs** are heavily **research-based**, usually **very specialized**, and encourage research-oriented careers after graduation (3-7 years)
- **When should you pursue an MBA?** After a couple years of industry experience

Preparing for Graduate School

How do I best apply for graduate school?
You will need (listed in order of importance)…

- High **GPA** and **GRE** scores
- **Faculty connections** and **Letters of Recommendation**
- **Good Essay Responses**
- **Prior project** or **research experience**
  - Project experience (if Master's)
  - Undergraduate research experience (if PhD)

SECTION I

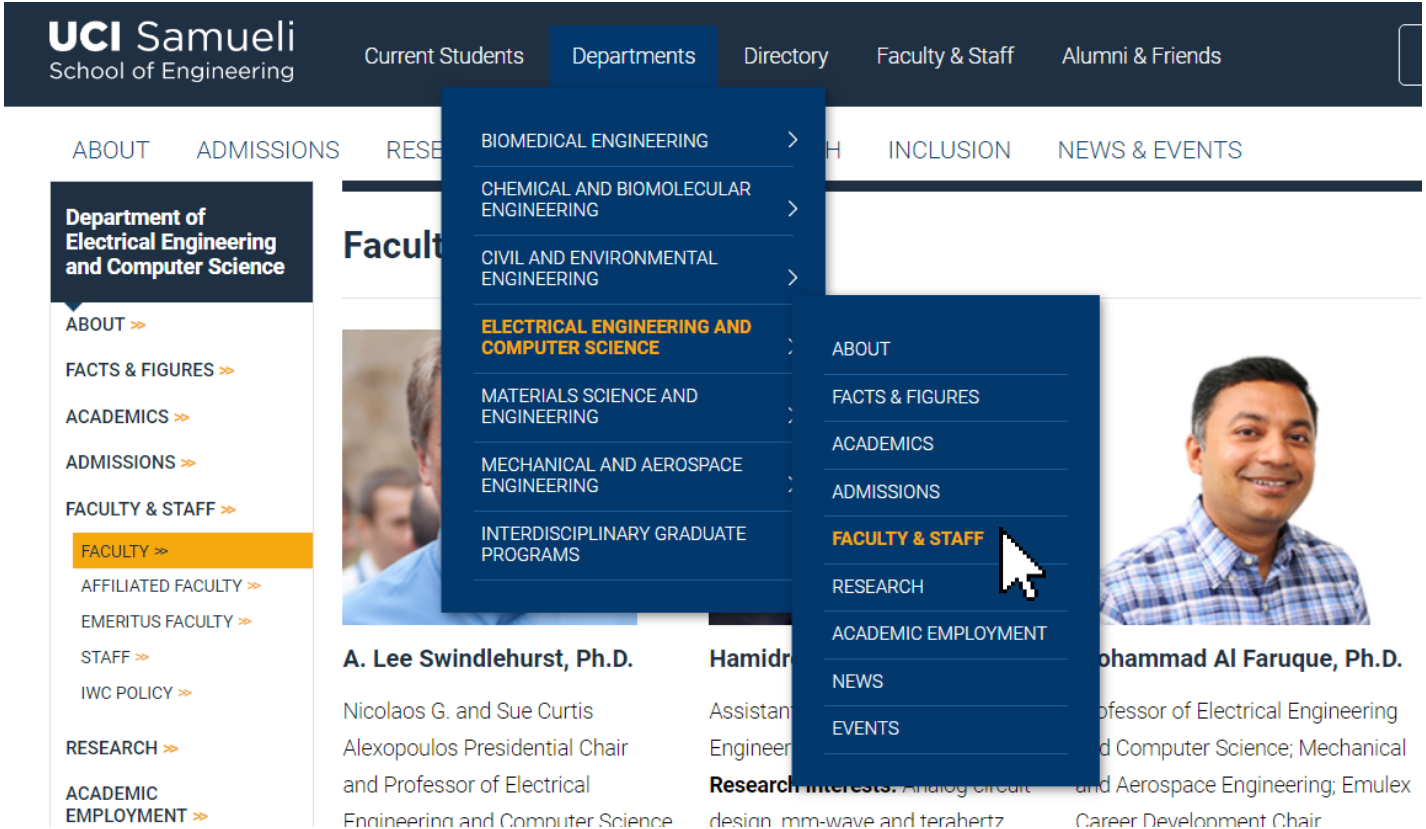
Undergraduate Research

Finding Research Opportunities

Many of your professors are involved in research, which you can get involved in…

- First find research topics that genuinely interest you
- Check out a professor's **faculty page** to learn more about their research area
- **Email the professor** whose research work interests you and inquire about their research OR **talk to them outside of class**

Faculty Pages & Research Areas



Sample Email to Professor

Dear ***Professor X***,

My name is ***Peter Anteater***, and I am very interested in becoming involved in research in ***Subject Area***. I am a ***X*** year student with a GPA of ***X***. I have taken ***Courses*** and ***Additional Experiences***. My goal is to ***Goal***.

I have reviewed your faculty profile and am interested in the work that you have done. I was intrigued by your journal article, ***"Article Title."*** It ***Additional Information about Topic***. I would like to get involved in research in this area because it will help me to better prepare for ***Goals***.

Would it be possible to meet with you to further discuss ***Topic*** and my possible involvement in research? I am available ***Days and Times***. I look forward to hearing from you.

Sincerely,

Peter Anteater

Email

(*Template from University Research Opportunities Program*)

UROP

- Check out the Undergraduate Research Opportunities Program (UROP) for more information on campus research, workshops, counseling, and more!
- UROP funds student projects and student-run programs too

Industry Pathway

Internships, Co-Ops, and Full-Time Jobs

Preparing for Industry

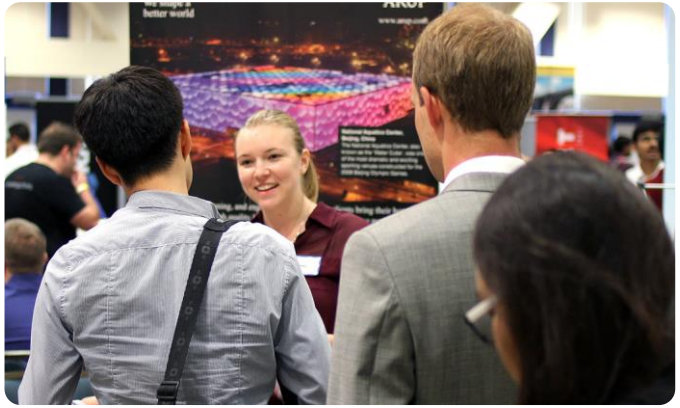
If you choose industry, you are looking for **internships**, **co-ops**, and eventually, **full-time jobs**…. what are those?

- **Internships** are usually **temporary Summer positions** which offer **mentorships** and **practical work experience** for some small monetary or college-unit-based compensation
- **Co-ops** are ostensibly internships **held during academic terms** (either part-time or full-time)
- **Full-time jobs** are **fully-compensated positions** which often require employees to have completed college degrees
    - Finding a full-time job is easier with internship or co-op experience

Preparing for Industry (Cont'd)

How do you get a job/internship?
You will need…

- **Project** and **leadership** experience
  - Attained through personal projects, hackathons, and senior design teams
- **Networking opportunities**
  - Job search sites, career fairs, industry nights, and, potentially, cold-calling



SECTION II

Projects

UCI Senior Design Projects

- **MAE Department** Senior Design Course
  - Mechanical Engineering and Aerospace Engineering students must take courses **MAE 151A and 151B**
- **EECS Department** Senior Design Course
  - CpE, CSE, and EE students must take courses **EECS 159A and 159B**
- Students **design and build projects** under the guidance of a faculty advisor
  - This is done in a team of 2-6 (on average)
  - The projects last two quarters (6 months)

UCI Senior Design Projects (Cont'd)

- The senior design courses are **taken sequentially** (usually Fall and Winter), each with regularly scheduled lectures and lab sections
- The courses culminate in the **Winter Design Review** where students of all departments **showcase their projects**
    - Students present to alumni, industry members, and judges for the Dean's Choice Award
- **Non-senior students can still participate** in some recurring senior design projects through **MAE 93**

Recurring UCI Senior Design Projects

- Some senior design projects are established as **large teams** (30+ students) with **multi-year development cycles** and **annual recruitment periods**
  - Ex) Rocket Project, HyperXite, Baja Racing
  - Students **participate for MAE 93 credits** until they are ready to take their senior design course
  - **In the senior design course**, students within the recurring project **form smaller teams** of 2-6 students
    - They create “sub”- projects which contribute to the larger, recurring project

Recurring UCI Senior Design Projects (Cont'd)

Here is an abridged list of popular recurring projects:

- Rocket Project – rocket design/launch
- CubeSat – low-orbit space satellite
- CanSat – satellite
- HyperXite – small-scale Hyperloop pod
- UAV Forge – unmanned aerial system
- Anteater Electric Racing - EV race car
- Formula SAE Racing - small Formula One race car
- Anteater Baja Racing - off-road race car

Common tasks/topics:
PCB design, embedded programming, materials engineering, structures, and radio communication

UCI Senior Design Projects (Cont'd)

- Find other design projects at projects.eng.uci.edu/projects
- Look for project recruitment announcements on the Engineering Newsletter

Home » Projects

Projects

Project name | Term | Year | Apply | Reset

- Any - | 2023-2024

2024 E-Bike Battery Optimization - Team 13

MAE

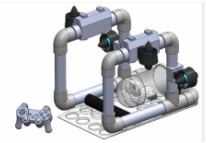
Summary:

In partnership with Saratech and the UCI Battery Lab, our project focuses on optimizing E-Bike batteries. We've selected lithium-ion batteries for their high energy density, long cycle life, and lightweight nature, ideal for electric bike applications. Specifically, we are opting for cylindrical battery types over prismatic and pouch cell types in order to prioritize airflow optimization for efficient cooling.

Read more

15A Remotely Operated Underwater Robotic Vehicle (ROV)

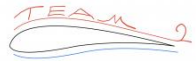
MAE



Coastal areas in California attract millions of tourists a year and the more crowded these areas become, the more they are prone to pollution and trash build up. There are a few solutions when it comes to debris collection from bodies of water. We propose an underwater remotely operated vehicle (ROV) capable of maneuvering and object retrieval. Our ROV is nicknamed Archelon and it features applications of modern technology derived from underwater ROV research.

Read more

2-Validation of a Numerical Prediction Method for Aerodynamics

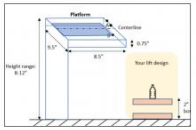


MAE

The project aims at testing the level of relativity between values of airfoil performance from prediction and the one in reality. Through the airfoil analysis tool (XFOIL), the team will simulate a numerical airfoils and obtain the values from the prediction. In the meanwhile, the team should design and manufacture the corresponding airfoils that are valid for wind tunnel test. Finally, the team will compare the results from the two methods and apply Technology Readiness Levels (TRL) to evaluate the conclusion relativity between prediction and reality.

Read more

2024 Winter Bottle Lift and Transfer Project – Team 17C



MAE

Summary

Read more

3D Printer Magnetization Head For Microscale Applications

MAE

Currently, there is a technological gap in the manufacturing processes for magnets with complex polarity patterns. Current manufacturing of magnets sacrifices the strength of the magnet to maintain a small size, and vice versa. The 2D Magnetization Head will be able to manufacture small, powerful magnets with complex geometries. Users interact by operating software which actuates the microcontroller, controlling the strength of the magnetic field produced as well as the motion of the gantry that the magnetization head is attached to.

Read more

Hackathons

- A **hackathon** is a collaborative marathon event where teams **create projects** in a **short period of time** (usually 24-72 hours)
  - Hackathons often have **prize money** or **other winnings** for the highest performing teams
  - There are hackathons for coding, embedded projects, mechanical engineering, and so on!
- Hack at UCI is UCI's largest hackathon
  - Student-run
  - Hosts beginner hackathons with workshops

SECTION III

Job Search and LinkedIn

LinkedIn

- LinkedIn is professional social media platform
  - Build your personal brand
  - **Showcase skills** and experiences (such as OPS!)
  - Find and **apply for internships** and jobs
  - **Network** with job recruiters, professionals, and friends
  - Linkedin Learning certifications

LinkedIn Profile

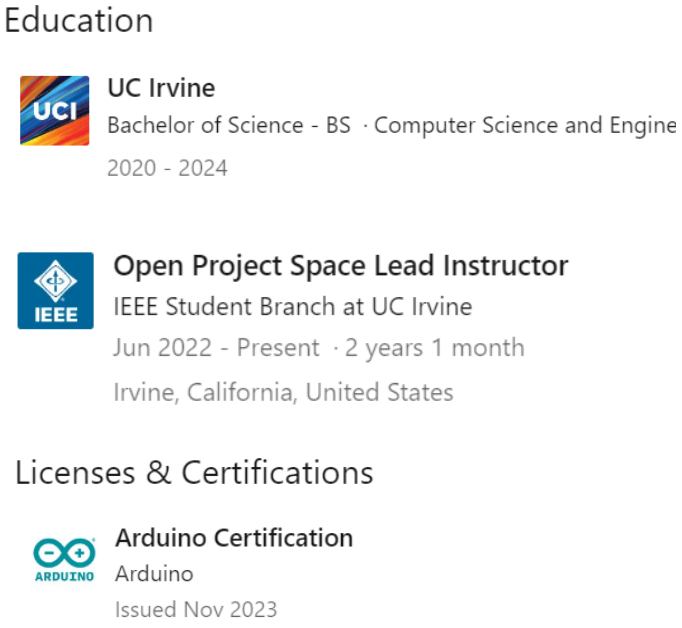
How do I build a good LinkedIn profile?

- Include a clean **headshot** and background photo
- Write a **headline** with job title, school or employer
- Summarize your background, **passions**, and future ambitions

LinkedIn Profile (Cont'd)

How do I build a good LinkedIn profile?

- Transfer resume information
  - Education, **internships**, project teams
  - **Skills**, certifications, and organizations
- Interact with industry content (like, follow, etc.)
- Get endorsed for key skills
  - IEEE at UCI will **endorse students** who **complete all OPS projects**
- Find peers and 



Other Job Search Tools

What other job search tools are there?

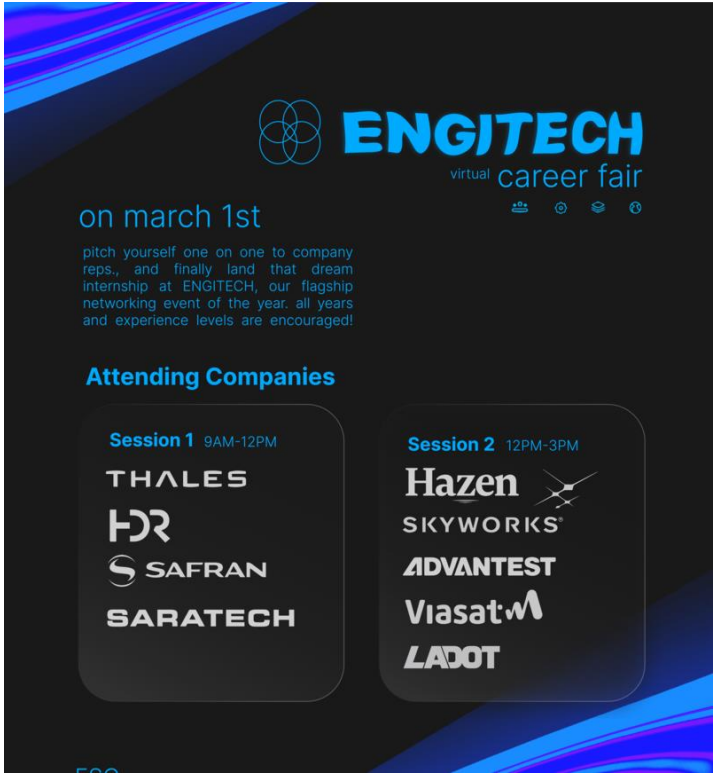
- Handshake is college student specific site
  - UCI's Division of Career Pathways uses Handshake for job and internship listings
  - Provides access to graduate school fairs and career fairs
  - You already have an account! Just login with your UCInetID and password
- Indeed (That's where Ben found his internship)
- Glassdoor

Career Fairs

- The Division of Career Pathways hosts multiple career fairs throughout the year
- They are great opportunities to network with company recruiters and find internships

Career Fairs (Cont'd)

- The Engineering Student Council (ESC) usually hosts the **EngiTECH Career Fair** during E-Week
- You can find more STEM-related career opportunities there
- E-Week is usually at the **end of the Winter Quarter**



Quick Job Search Tips

- **Apply to a lot** of jobs/internships (10-15 per week)
  - Some people apply to over 100 jobs before receiving an offer, so don’t be discouraged!
- **Start your search** for Summer 2025 internships now
  - Google and Amazon open their applications for next year over Summer 2024… other major companies do the same

Quick Job Search Tips (Cont'd)

- **Network! Network! Network!** Network with companies at career fairs and on LinkedIn
  - Seeking referrals from recruiters will help you bypass ATS and move straight to technical/behavioral interviews
- **Prepare for interviews** and **tests** while you're searching
  - If you're looking for a CS job, time to LeetCode
  - If you're MechE, get your CSWA, CSWP, or even CSWE certification
  - Practice with common behavioral interview questions

SECTION IV

Resumes

Resumes vs CVs

- **Resumes** are a **one page document** summarizing your skills, experiences and accomplishments
- **Curriculum Vitae** **(vee·tai)** or **CVs** are more detailed than resumes and include research experience, publications, and references
    - You’re probably not going to write a CV for internships

What to Include in Your Resume

- **Education**
  - Do not list your high school
  - Include “University of California, Irvine” with your expected graduation date (month and year)
  - Include your degree title… for example “Bachelor of Science in Computer Engineering”
  - Include Minors, GPA, Honors/Awards (Dean’s List, Campuswide Honors, etc.)
  - Optional: Relevant Coursework (List 3-5 course titles related to the position you are applying)

What to Include in Your Resume

- **Experience (Jobs, Internships)**
  - Include the job title, organization name, city and state, and the dates you worked there
  - Use **action-verb-led phrases** to describe and **quantify** your accomplishments and results
  - Try using ChatGPT to make bullet points concise
- **Activites, Volunteer Experience, or Leadership Experience**
  - Same tips as above

What to Include in Your Resume

- **Skills and Interests** (“Hard” Skills)
  - Computer or lab skills
  - Language skills, including the level of competency (i.e conversational, fluent)
  - Examples: “C++, Python, Solidworks, Object Oriented Design, Embedded Systems”
  - Don’t include skills that you wouldn’t feel comfortable interviewing on

Resume Formatting

- Today's resumes are processed by **Applicant Tracking Systems (ATS)** before reaching a human recruiter
  - Research suggests the vast majority of resumes are rejected by ATS
- Adopt **standard formatting** and **simple fonts** to pass the ATS filter
  - Avoid pictures, colors, fancy designs, and tables
  - Microsoft Word documents work often better for ATS than PDF versions of resumes

Resume Tailoring

- **Make a copy** and **tailor your resume** to better fit each job description
- **Include keywords** from the job advertisement in your resume
    - If the ad says “computer skills” change the resume section on “technical skills” to the same phrase
- Write a resume tailored to each application, including the keywords, phrases, and most relevant experiences for that job

Resume Sample

- Here’s an sample engineering resume
- Find more information and examples at the Division of Career Pathways’ Resumes and Samples page

How to Put OPS in Your Resume - Sample

UCI Student Section, Institute of Electrical and Electronics Engineers

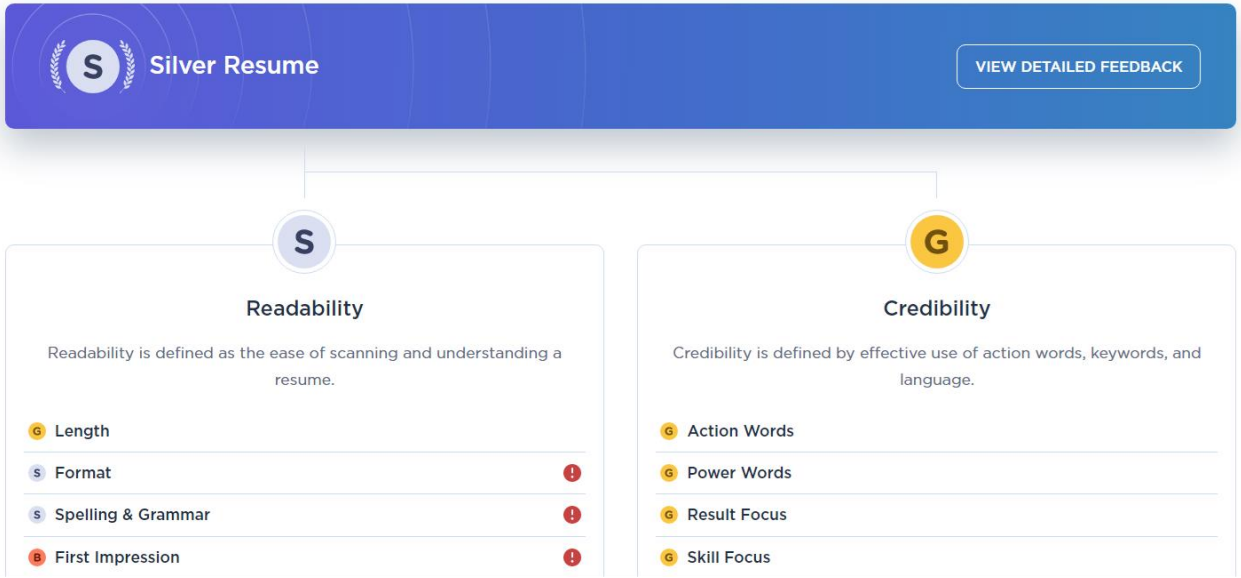
October 2023 - June 2024

Open Project Space Member

- Attended a yearlong course, developing real-world electronics skills in areas including ICs, breadboarding, soldering, PCB design, microcontrollers, and hardware communication
- Designed a wirelessly-communicating weather station with temperature, humidity, and light sensors
- Built an RC rover with a custom PCB remote control

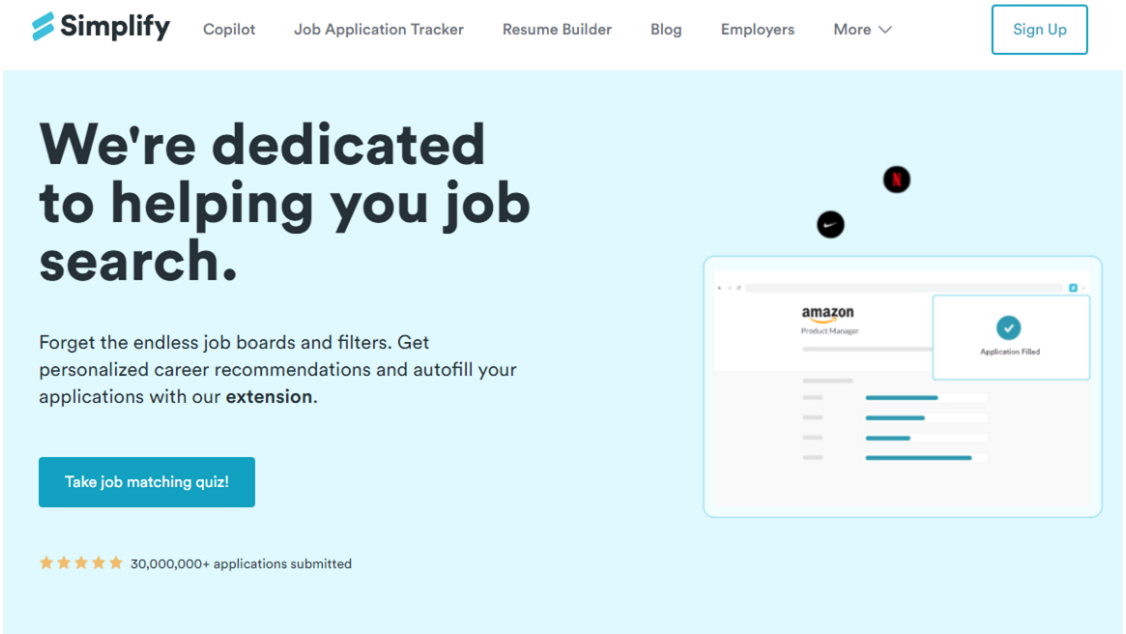
Assistive AI Tools for Resumes

- Use Resume AI by Big Interview to receive suggestions for improving your resume. Just upload your document!



Assistive AI Tools for Resumes (Cont'd)

- Try Simplify for tracking job applications and auto-filling application forms

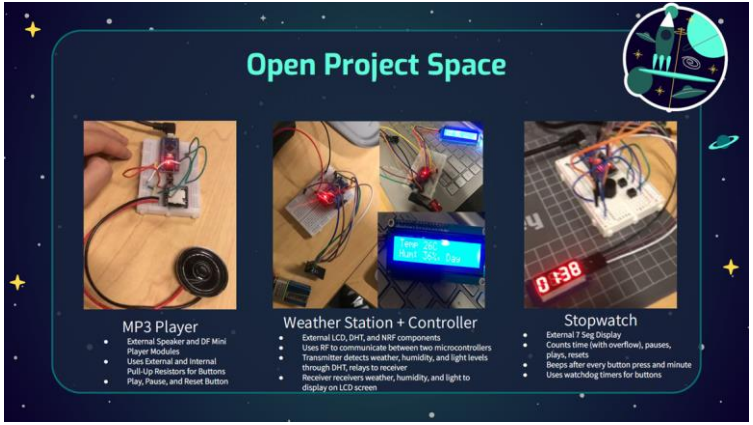


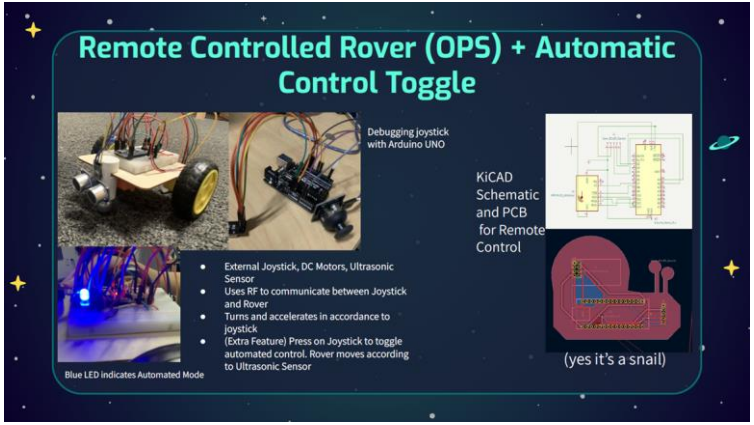
SECTION V

Portfolios

Portfolios

- Unlike resumes, [portfolios] primarily highlight **project experience**
  - They summarize projects much like resumes with **concise bullet points**
- Portfolios can be made as PDFs from a powerpoint
  - Include a title slide (name and personal info) and project slides





SECTION VI

Final Thoughts

Final Thoughts

- **Connections** with faculty are **critical to graduate school admissions**
  - Attend your classes and interact with your professors (who will later become your advocates during application season)
- **Undergraduate research** can be an easy pipeline for PhD programs
- **Network** like there's no tomorrow!
  - Career fairs, professor chats, networking nights… take advantage of all of them! This will get you past the initial screenings
- **Projects and internship experience are key** to the full-time job search
  - You must prove your technical skills through tangible deliverables

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