# AI4Good Lab

# Grad Studies Q&A



Presented by:
**Sarah Davis**

Nov 9th, 2021

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10:45 - End of Hour




# Poll time!



- What city are you joining from? What school?
- What program are you in?
- What year are you in?
- Are you decided on grad school, or still considering other options? (0 = undecided, 1 = decided, 2 = other)
- What is your dream job?

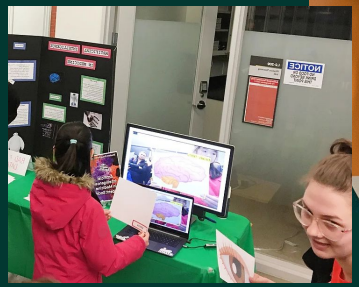


# Hello!

- Sarah Davis
- 2nd year M.Sc. Computing Science student at the University of Alberta
- B.Sc. Biological Sciences, Computing Science Minor (2020 Grad)
- They/them please!
- Not an admissions expert...











# My Journey

From 1st year undergrad to now

# General Timeline

**Sep, ‘16**
Started Neuroscience Degree

**Apr, ‘17**
Oops, flunked out of honours program

**Sep, ‘17**
Take first CS course of my life

**Feb, ‘18**
Oh snap I gotta go to grad school!

**Summer, ‘18**
First research internship!

**Nov, ‘19**
Applied for CS Grad Program

**Summer, ‘19**
Second research internship, continues part time

**Jun, ‘20**
Convocation!

**Jan, ‘20**
Accepted into CS Grad Program, first publication, start second part-time research job

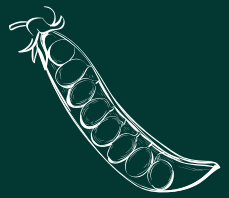
**Sep, ‘20**
Starting grad school

**Summer, ‘20**
Summer of three supervisors

**Sep, ‘21**
Begin working as ML Course Facilitator

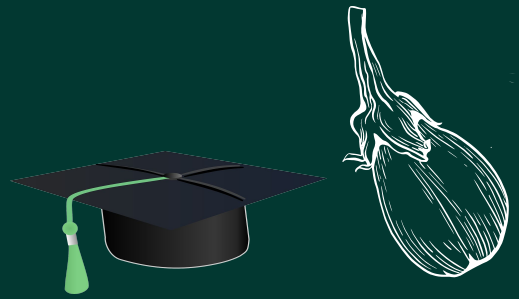
**Summer, ‘21**
Amii / NRC Machine Learning Internship

2017 2018 2019 2020 2021



# Undergrad Experience (2016-2020)

- Slightly non-traditional for a CS grad student
  - Anything can happen!
- Hons. Neuro
  → Biosci Maj, Bioin Min
  → Biosci Maj, CS Min
- Just because your background isn't the norm, doesn't mean you can't be successful
  - Diversity of experience can be an asset








# Turning Point (2018)

- Near the end of my second year, I set the goal of getting into grad school for... **Not** CS and **not** at the U of A

- Almost single-mindedly pursued this for 1.5 years, which lead me to getting research experience which did ultimately help find where I wanted to be
  - Nothing wrong with trying different things until stuff starts to make sense





# First Research Experience (2018)



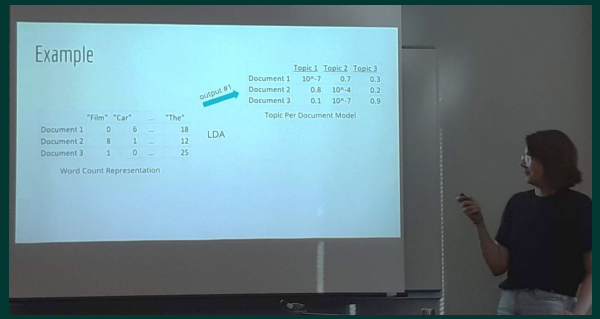
- Kind of a long story of how I got the position...
- First month or so was helping my supervisor finish up a manuscript
- Months 2-4 was working on a new project!
- I was very, very inexperienced, and ended up with a “trial by fire” intro to machine learning
  - Learned A LOT



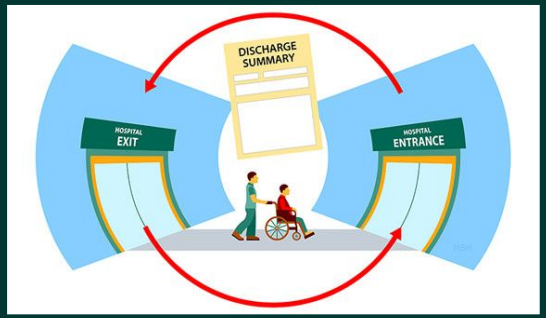


# Big Projects (Started in Undergrad)

- Cancer topic modeling
  - 2018-present

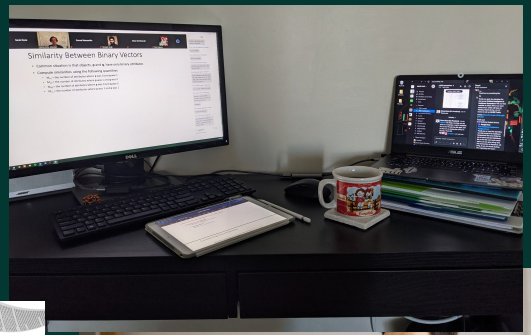



- Readmission prediction
  - 2020-present



# Graduate School (2020-pres)

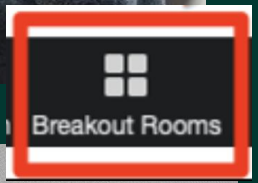


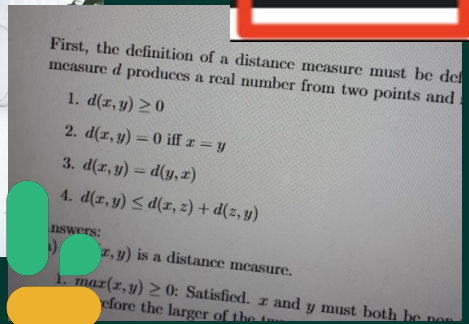





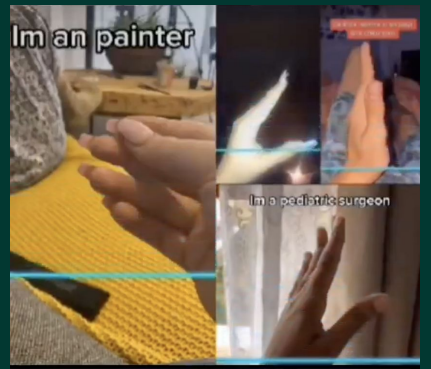


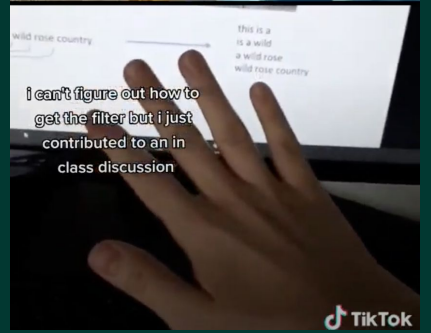





**Evaluate the Performance of the Stack-RNN Model**

```
# Training set accuracy
correct_num = test_model (model, training_input, training_output)
print ('Training accuracy: {}.'.format(correct_num))
```

```
Training accuracy: (4.82, 241).
```

```
# Test set accuracy
correct_num = test_model (model, test_input, test_output)
print ('Test accuracy: {}.'.format(correct_num))
```

```
Test accuracy: (0.0, 0).
```

# ML Internship (2021)

- I applied to 17 different postings for a summer 2021 internship
  - 🔇
- Eventually heard back from four, and that was to reject me
- Realized I was going about this wrong!
  - I spent the last three years building a relationship with the Alberta Machine Intelligence Institute
  - Why not see if they can help?
- Miraculous timing!



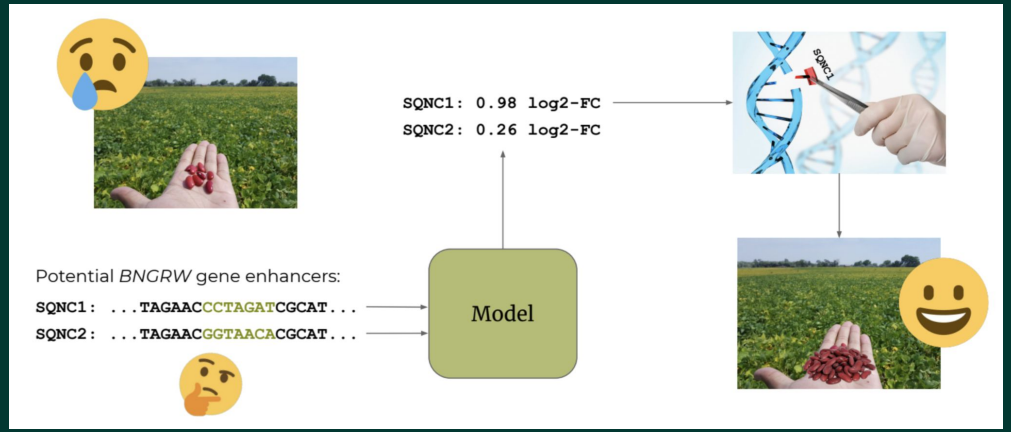


amii

# Deep Learning for Crop Genomics

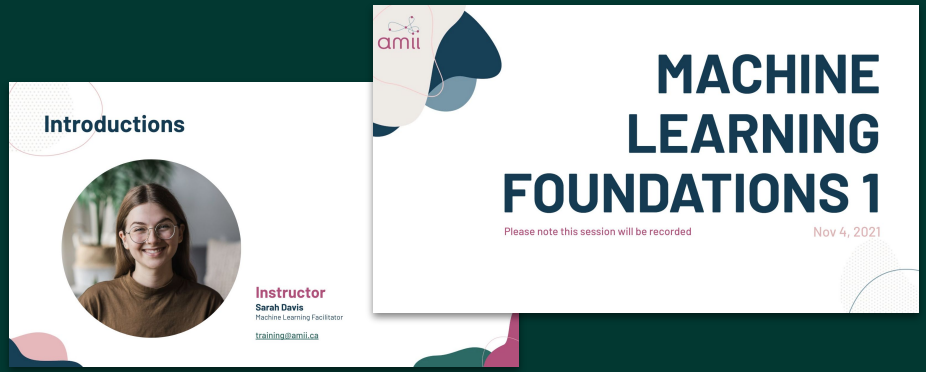
- Worked with Amii and the National Research Council to prototype solutions for gene expression prediction
  - Given gene sequence, predict its gene expression “effect”

- Really interesting applications in precision agriculture!



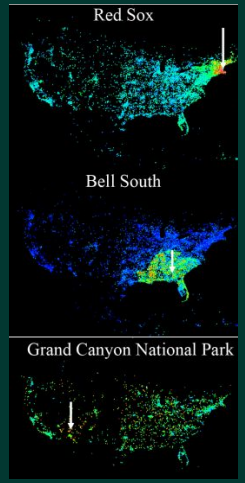
# ML Facilitator (2021-pres)

- Opportunities breed more opportunities!
  - (Amii again 😁)
- Chance to hone my teaching skills part-time

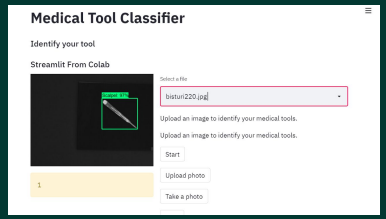


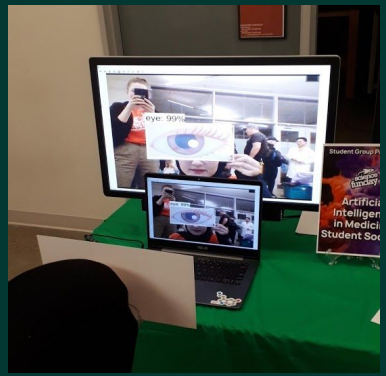



# One Bajillion Projects




- Organ object detection
- Data-driven disease heritability estimation
- Predicting covid outbreaks using Twitter data
- Predicting mask wearing using sociodemographic factors
- Mapping Multi-Layer BERT Features and EEG Representations
- Stack Augmented Neural Networks for Transduction
- Latent Dirichlet Allocation Topic Modeling for Sentiment Analysis
- Medical tool classification
- SHEST: Secular Heritability ESTimate
- ...

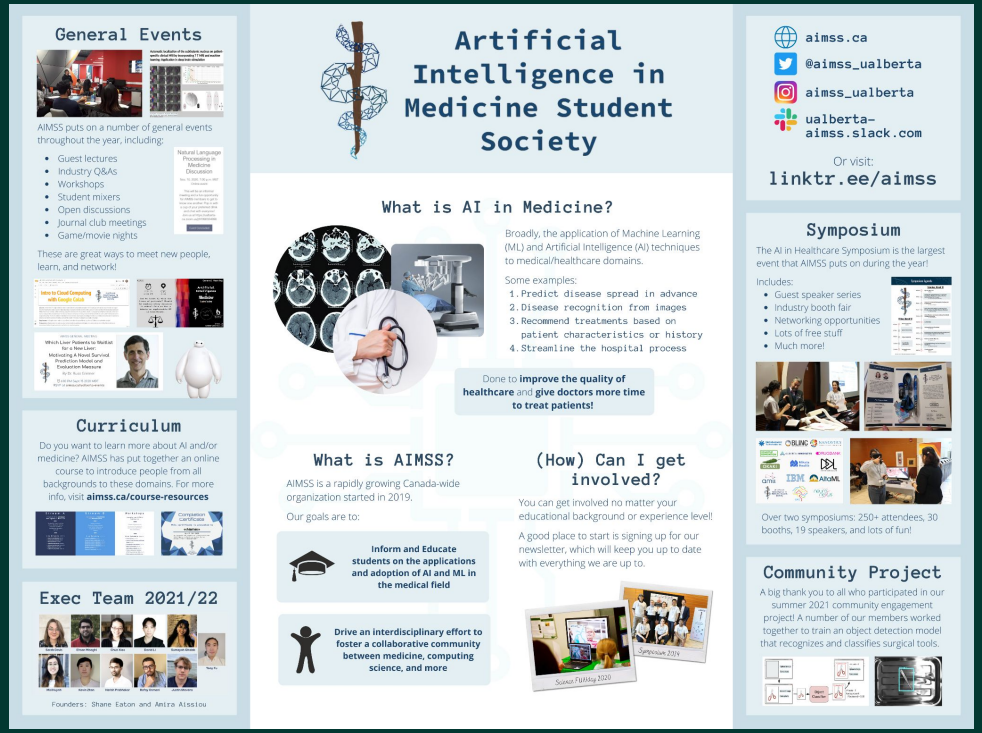




# AI in Medicine Student Society

- Where do I even start???
  - 2019-2021 totally changed my life
- VP Internal, Co-President, symposium director, content creator, workshop facilitator, graphic designer, etc etc etc

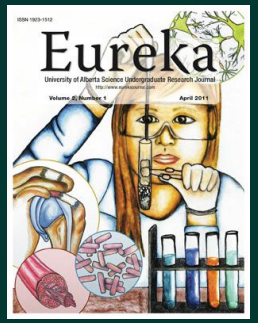


# Other Extracurricular



- Judging and reviewing for UAlberta undergraduate academic journal, Eureka
- Tutoring
- Mentorship, hosting events for younger students, speaking on panels
- Now I'm approached to do stuff like present to you all today!
- There are always people who can learn from your experience





# Advice!

What I wish I knew about applying to grad programs, marketing myself, getting jobs, etc.





# Application Process





# Application Process

- Pay really close attention to the deadlines!
  - Confirm references at least 3 weeks in advance of deadline
  - Complete application at least 2 weeks in advance of deadline
- Fall break (Oct/Nov), winter break (Dec/Jan) are your friends!
- Research potential supervisors in this time if you haven't already done so
  - Normally doesn't hurt to reach out and say hello!
  - Many applications will ask you to list who you are interested in working with (if you don't already need to have a supervisor)





# References



- Who to choose for your letters of recommendation? Formula that worked for me:
  - Someone who was **really familiar with my work** (supervisor)
  - Someone who **knew my potential as a student** (a prof whose course I did very well in, went to their office hours, etc.)
  - Someone with a bit of **name recognition** (in my case, department chair who taught me a class)



- Normally, references letters are completed through a web portal
  - You can often relinquish your right to read them in your applications - pros and cons

# Write a cover letter / letter of intent



[Name]
[Address]
[City, State, Zip]
[Phone]
[Email]

Dr. Merrill Yates
Dean of the College of Graduate Studies
Arizona State University
411 N. Central Avenue
Phoenix, AZ 85004

Dear Dean Yates,

I am writing to inform you of my interest in the Master's of Science in Mechanical Engineering Program at Arizona State University. I have submitted my application with applicable documentation.

I currently hold my Bachelor's of Science in Mechanical Engineering from Washington State University (WSU), having graduated cum laude with a GPA of 3.76. While attending WSU, I participated in the American Society of Mechanical Engineer's Lighter than Air UAV competition, scoring third place with a team of fellow student engineers.

I developed an interest in engineering and technology in high school, having spent my junior and senior years in the Aerospace Science and Technology program at Rainier Beach High School. During my time in the program, I learned a great deal about the interworking of engines and airfoils. This convinced me to apply to the Aerospace Engineering program at WSU. This program allowed me to study many different subjects, including physics, aerodynamics, mathematics, and fluid dynamics.

In addition to my demonstrated skills in the design and engineering of aircraft, I also spent two years as an undergraduate researcher. During my time as a researcher, I studied fluid flow of magnetic particles suspended in a viscous fluid. As a result of my research, I was able to publish a paper titled "Magnetic Particles in Viscous Fluid Flow" with Dr. Thomas Roundtree.

Given my education and experience, I am confident that I am an excellent fit for the ASU MSME program. I have researched the program and determined that the coursework and research profile of the college are a strong match. If you have any further questions, please contact me using the information at the top of this letter.

Respectfully,

John Smith



# GPA



- Most common questions I get:
  - “Is my GPA good enough?”
  - “What is the competitive GPA?”
  - “What GPA did you get in with?”



- Most (Canadian) schools in my experience look at approx. the last two years / 60 credits

- If you reach the minimum GPA requirements, then your GPA alone will not be the “deciding factor” – they will look at your application holistically
  - Publications, extracurriculars, etc.





# After you get in





# General Advice

- Celebrate! Make sure to accept your offer before the deadline (check all possible email addresses for communications)




- Start thinking about topics you would like to explore
- As soon as you start, begin attending public thesis defenses/presentations
  - Begin to think about what makes a compelling research project and how to communicate your ideas



# Courses





- DISCLAIMER: most relevant if your program works like mine
- Now is the time to email potential supervisors!
  - Not to ask them to be your supervisor (yet)
  - Ask what courses they would want a potential student to take
  - Increases your chance of them taking you on
- Above all, take a balance of courses you think are interesting and courses that will increase chances of success in your research field

# Thesis Topic?

- Since UGrad, I worked on a little bit of everything to get a sense of what I thought was interesting
  - No regrets, but...



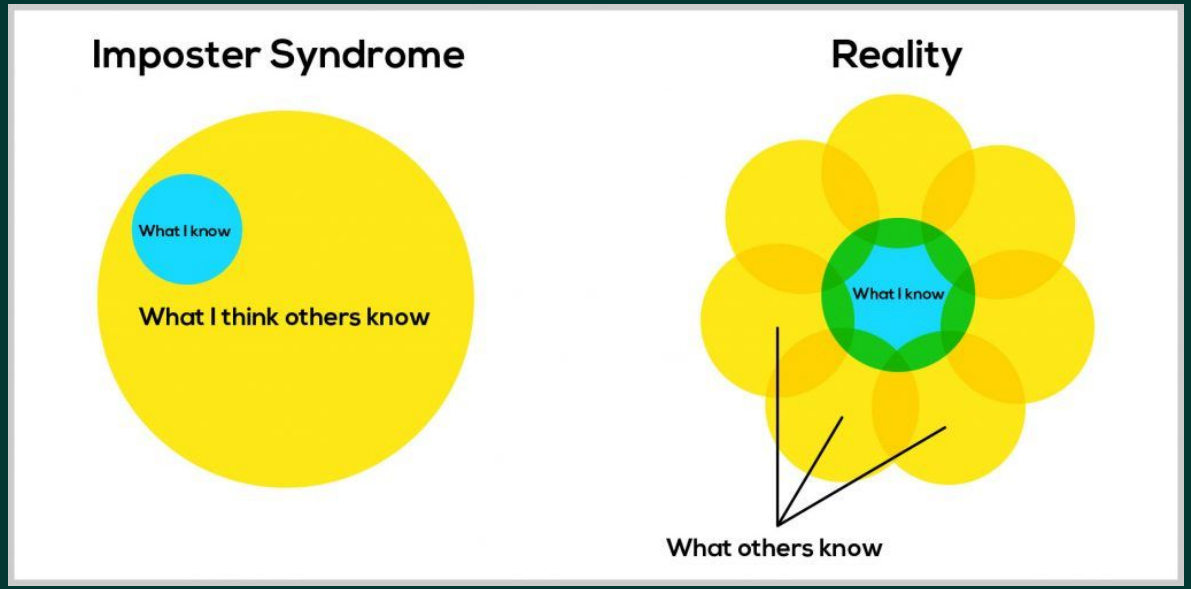
- Thesis topics can come from a number of places:
  - Extension of your previous work
  - Extension of work within your supervisor's lab
  - Novel idea from you or your supervisor
  - Starting with a problem you want to solve and going from there
  - Working with an external organization*



- You're not expected to make machine learning 2.0 during your master's!



# Impostor Syndrome



# Internships



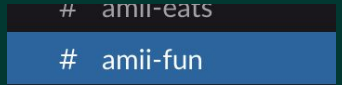
- 101% recommend doing internship in industry during grad school
- Eyes should be open for opportunities starting around November of the previous year
- Apply to lots of places, but don't waste your time applying to jobs where you don't meet at least 80% of the qualifications
  - Stakes are low, be picky if you like
- The closer to your eventual thesis project, the better!



# Have fun and meet lots of people!

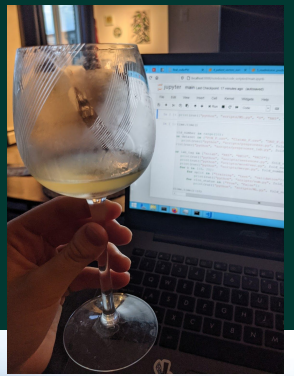
- Good for your mental health and your long-term career





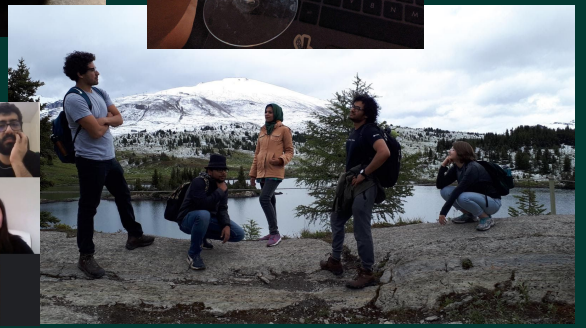












# What can I start now?





# Marketing Yourself and Your Brand

- The world isn't going to ***ask*** you what you have to offer
  - Think about your unique skills and talents and make sure you put that information out there!
- Being recognizable is incredibly valuable:
  - Online presence ✅
  - IRL presence ✅
- Chances are, you already all have a head start...





# Leveraging Professors



- If you're in classes still...
  - Sit in the front
  - Ask questions in class
  - Go to office hours, even if you don't have any questions
  - Ask to go over mistakes on your exams
    - Even if you aced them 😈



- Great to have that relationship in your back pocket!
  - Reference letters
  - Jobs (industry connections)
  - They're just cool people!



# Networking



- IMO, nothing beats in-person events
  - Things are starting to happen again!
  - Keep an eye out for departmental, student group, and external events
    - Lame, but works: read newsletters
  - If you see someone who you think is cool, chances are they are there to network too! Introduce yourself
  - Bring a friend if you need moral support

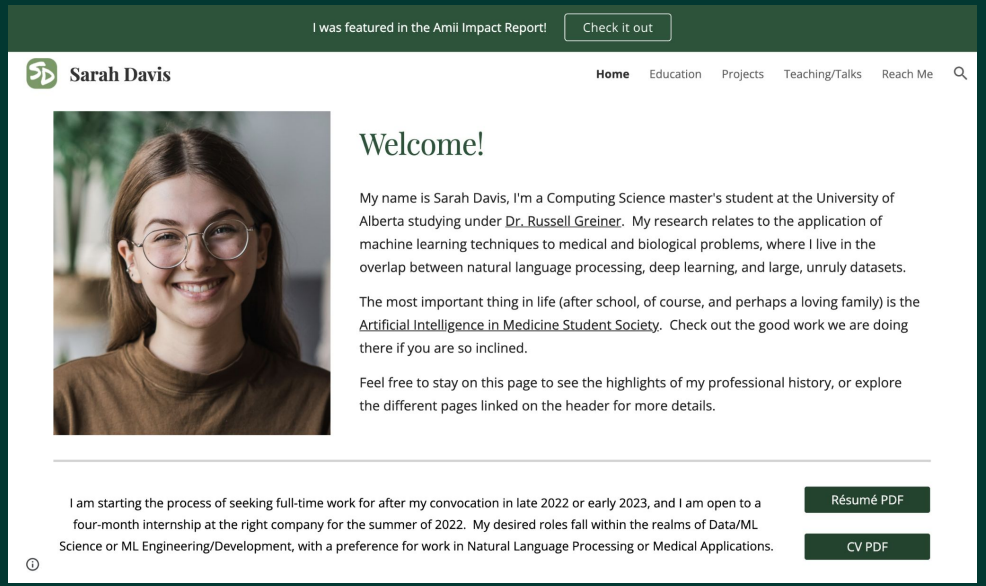


- LinkedIn account is now the bare minimum in tech
  - Don't be afraid to share your successes with your network!



- "Shallow" vs "deep" networking

# Personal Website / Social Media









# Public Speaking

- Maybe some of you are natural public speakers, but that is not true for everyone



- The only way I was able to crush my social anxiety and fear of public speaking was repeated exposure to it

- Tips:
  - Work your way up
  - Create some good experiences where you speak to something you really know and care about
  - Join a club like Toastmasters!



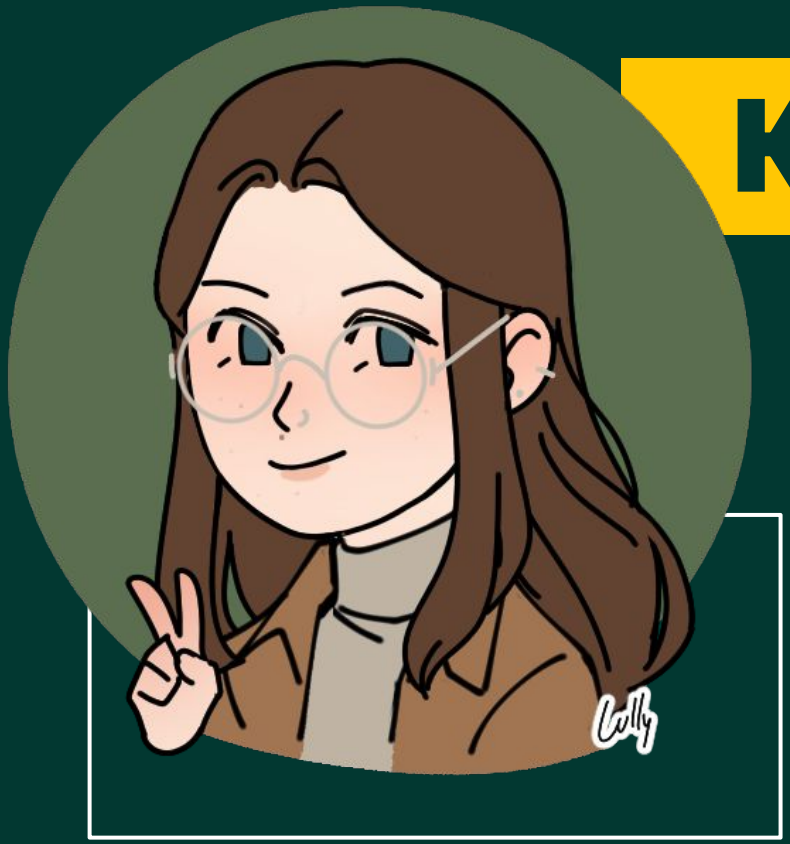
# Seize Opportunities





# Q&A

Ask me anything!



# Keep in touch!


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