

# Amil V Dravid

Updated December 15, 2021

**Email:** amildravid2023@u.northwestern.edu

**Phone:** (224) 406-3693

**Website:** <https://avdravid.github.io/>

**Google Scholar:** <https://scholar.google.com/citations?user=YZ8Y-sUAAAJ&hl=en>

**GitHub:** <https://github.com/avdravid>

**LinkedIn:** <https://www.linkedin.com/in/amil-dravid/>

## Overview

Northwestern University computer science and statistics junior with interests in artificial intelligence: specifically deep learning, computer vision, and their mathematical foundations and theory. I am particularly interested in foundational research with broad applications not only to computer science and engineering, but with potential to improve society through avenues such as healthcare. I aim to pursue an academic career in research and teaching at the university level.

## Research Interests

Artificial Intelligence, Computer Vision, Machine Learning, Deep Learning, Computational Photography, Autonomous Systems, Medical Imaging

## Education

<b>Northwestern University</b>	Evanston, IL
Robert R. McCormick School of Engineering	Junior: Sep. 2019 – Present
BSc in Computer Science, Statistics Minor	GPA: 4.00/4.00

<b>Glenbrook South High School</b>	Glenview, IL
Science and Engineering (STEM) Program	Aug. 2015 – June 2019
High School Diploma	GPA: 5.00/4.00

## Relevant Coursework

Deep Learning: Foundations, Algorithms, Applications; Machine Learning; Computer Vision; Statistical Pattern Recognition; Computational Photography; Fundamentals of Computer Science I (Racket) and II (C, C++); Mathematical Foundations of Computer Science (Discrete Math); Data Structures and Algorithms (Racket DSSL2); Human-Computer Interaction; Engineering Analysis Sequence (MATLAB and Linear Algebra); Signals and Systems; Statistical Theory and Methods; Applied Linear Algebra; Introductory Statistics; Multivariate Calculus

## Honors and Scholarships

<b>The Barry Goldwater Scholarship</b>	2021
<i>Awarded \$15,000 scholarship over junior and senior year for excellence in natural science, mathematics, or engineering research.</i>	

<b>CRA Outstanding Undergraduate Researcher Honorable Mention</b>	2021
<i>One of the ~100 undergraduate students nationally recognized as making significant contributions and displaying potential in computing research.</i>	

**Google CS Research Mentorship Program (CSRMP) Class of 2021** 2021

*Selected as a participant for Google CSRMP to pursue a research project on the basis of readiness and a clear vision in contributing to computing research.*

**McCormick High Honors** 2019 - 2021

*Awarded for achieving a perfect 4.0 grade point average each quarter*

**Summer Undergraduate Research Grant** 2020

*Awarded a \$3500 grant by the Northwestern Office of Undergraduate Research to conduct an independent summer research project based on my proposal.*

**National Merit Scholarship** 2019

*Awarded \$10,000 scholarship over four years of college for excellence in high school.*

**2X American Invitational Mathematics Exam Qualifier** 2018, 2019

*Top 500/20% of AIME test takers. Students qualify for the AIME by placing in the top 5% in the AMC 12 or 2.5% in the AMC 10, exams administered by the Mathematical Association of America.*

**Publications**

**Visual Explanations for Convolutional Neural Networks via Attribution in a Generative Latent Space**

**Dravid A.**, Gong B., Schiffers F., Cossairt O., Katsaggelos AK.

In preparation

**Investigating the Potential Of Auxiliary-Classifiers GANs for Image Classification in Low Data Regimes**

**Dravid A.**, Schiffers F., Wu Y., Cossairt O., Katsaggelos AK.

Submitted to *IEEE International Conference on Acoustics, Speech and Signal Processing*, 2022.

**Visual Explanations for Convolutional Neural Networks via Latent Traversal of Generative Adversarial Networks**

**Dravid A.**, Katsaggelos AK.

Accepted and to appear as student abstract in *AAAI Conference on Artificial Intelligence*, 2022.

**Early upper aerodigestive tract cancer detection using electron microscopy to reveal chromatin packing alterations in buccal mucosa cells**

Bugter, O & Li, Y., Wolters, A., Agrawal V., **Dravid A.** et al

*Microscopy and Microanalysis*, 2021.

**DeepCOVID-XR: An Artificial Intelligence Algorithm to Detect COVID-19 on Chest Radiographs Trained and Tested on a Large US Clinical Dataset**

Wehbe, R., Sheng, J., Dutta, S., Chai, S., **Dravid, A.** et al

*Radiology*, 2020.

## Research experience

### **Interpretation of Brain Morphology in Association to Alzheimer's Disease Dementia Classification Using Graph Convolutional Networks on Triangulated Meshes**

Azcona, EA., Besson, P., Wu, Y., Punjabi, A., Martersteck, A., **Dravid, A.** et al  
International Workshop on Shape in Medical Imaging at MICCAI 2020

### **Employing deep networks for image processing on small research datasets**

**Dravid, A.**

*Microscopy Today*, 2019.

### **Northwestern Image and Video Processing Lab (IVPL):**

<https://ivpl.northwestern.edu/>

Advisor: Professor Aggelos K Katsaggelos Oct. 2019 – Present

I work with fellow lab members on research projects as well as lead projects related to machine learning and computer vision. My work ranges from medical imaging applications of deep learning to mathematical foundations of architectures and frameworks such as Generative Adversarial Networks (GANs).

### **Computational Photography Lab (CPL)**

<https://compphotolab.northwestern.edu/>

Head: Professor Oliver Cossairt July 2020 – Present

In conjunction with my work in the IVPL, I collaborate with members of the Northwestern Computational Photography Lab headed by Professor Oliver Cossairt. PhD student Florian Schiffrers serves as a mentor and co-collaborator.

### **Google Mentorship**

<https://research.google/outreach/csrmpp/>

Mentor: Dr. Boqing Gong Jan. 2021 – July 2021

After matching with Google researcher Dr. Boqing Gong through the Google Computer Science Research Mentorship Program, I received mentorship as I pursued a project at the intersection of computer vision and deep learning.

### **High School Research**

Mentors: Yue Li, PhD and Karl Hujak, PhD Dec. 2017 – Jan. 2019

As a high school junior and senior, I explored convolutional neural network applications to transmission electron microscopy (TEM). Yue Li, then an applied physics and materials science graduate student, as well as Karl Hujak, then a materials science graduate student, guided me in this process. This ultimately sparked my love for computer science research, and led to a single-author publication highlighted in the Publications section above.

## Teaching experience

### Teaching Assistant (Computer Science Dept., Northwestern)

*COMP SCI 349: Machine Learning*

*April-June, 2021*

As a teaching assistant, I graded coding and written assignments, held multiple weekly office hours, and taught some lectures.

### Student-Led Mini-Class (Computer Science Dept., Northwestern)

*Deep Learning in Practice*

*Jan. 4-8, 2021*

One-week workshop part of student-led classes pilot program. My workshop surveyed various applications of deep learning in professional, industry, and research settings. ~50 students in this course learned how to code mini-projects in PyTorch and Tensorflow/Keras such as voice recognition or object detection systems.

## Press Coverage

[Northwestern Now](#)

April 2021

*Three Northwestern undergrads earn Goldwater scholarships*

[Northwestern Computer Science Department News](#)

Jan. 2021

*Four Students Receive Honorable Mention in CRA Undergraduate Research Awards*

[Forbes](#)

Nov. 2020

*Northwestern University Has Developed An AI System That Helps Detect Covid-19 On Chest X-Rays*

[Northwestern Now](#)

Nov. 2020

*A.I. detects COVID-19 on chest X-rays with accuracy and speed*

[The Glenview Lantern](#)

July 2020

*GBS graduates develop tool to take guesswork out of college admission process*

[The Oracle](#)

March 2020

*Dravid's work published in science magazine Microscopy Today*

## Skills

### Technical

Python, Java, PyTorch, C, C++, Keras, Tensorflow, MATLAB, LaTeX, research, manuscript preparation

### Languages

English (native), Spanish (working proficiency), Marathi (elementary proficiency)

## Activities

### Institute of Electrical and Electronics Engineers (IEEE)

March 2020 - Present

*President (2021-2022), Project Manager (2020-2021) of Northwestern Chapter:* Attend weekly meetings to plan events that promote technology at Northwestern. This includes a yearly project showcase sponsored by various companies. Mentor a group of students in a machine learning/AI project.

### ProjectX

Aug. 2021 – Jan. 2022

Collaborate in an interdisciplinary group of my Northwestern peers in a continental undergraduate research competition focusing on AI in health: [competition site](#).

### Society of Asian Scientists and Engineers

Sep. 2019 – Sep. 2021

*Head of Internal Affairs of Northwestern Chapter-* Organize professional events with professors and industry leaders as well as plan community-building gatherings for members. Host weekly meetings for the committee and attend larger general meetings weekly.

### Northwestern Computer Science Mentorship Program

Sep. 2020 – June 2021

*Computer Science Buddy/Mentor:* Host weekly meetings to advise freshman computer science students. Discuss how to navigate classes, obtain research/internship opportunities, and deal with mental health issues as well as college life.

## Other interests

### Taekwondo

2012 –

Third degree black belt. Compete nationally and internationally in *poomsae* (forms). Ranked nationally and internationally. Attend three weekly team trainings as well as personally train and condition daily.

### Jazz Percussion

2012 –

Keen jazz listener and drummer. Performed at venues such as the Chicago Symphony Center and Northwestern's Bennett-Gordon Hall.

### Learning

Online courses on Coursera (Deep Learning Specialization certification), Udemy. Enjoy watching documentaries to learn about random non-technical topics.