

# AI Content Generation.

AI Essay Writing – Kyle Van Hoesen

## The Good AI

### **Pros:**

The AI was able to write the essay super quick and produced great results. It talks smoothly and grammatically correctly.

### **Cons:**

Good AI is not a free service for longer essays so it is limited to what it can write for free.

### **Algorithm:**

Uses a neural network of other essays that I can pull from for knowledge. Not much is publicly available.

### **Training Data:**

Good AI is trained off millions of papers. “The neural network AI model provides enormous amounts of accurate and well-written text that allows it to produce its own unique content for you.”

## Chat GTP

### **Pros:**

It is super advanced and sounds exactly like a human writer. It also can answer questions based on what it wrote and can go back and change things if it needs to be updated. To find out how it works all that is needed is to ask Chat GPT.

### **Cons:**

ChatGPT will not write an entire essay. It will only do a page or two. It will set up outlines or can complete it in multiple prompts. But for super long works it is programmed to not write everything for you.

### **Algorithm:**

“As an AI language model, I was trained on a large dataset of human-written text using a deep learning algorithm called a transformer neural network. Specifically, I was trained using a variant of the transformer model called GPT (Generative Pre-trained Transformer), which was developed by OpenAI. GPT is a machine learning algorithm that uses unsupervised learning to generate human-like text. During training, I was fed large amounts of text and learned to predict the next word in a sentence based on the preceding words. This allows me to generate coherent and grammatically correct sentences and paragraphs, such as the one about sea otters that you requested.”

### **Training Data:**

“As an AI language model, I was trained on a massive dataset of text, which was sourced from various publicly available online sources. The training data includes a diverse range of sources, such as books, articles, websites, and other forms of online text. The specific sources used for my training data are not publicly disclosed, but they were selected to be representative of natural language usage across a wide range of topics and domains. The training data was preprocessed and cleaned to remove any personally identifiable information or other sensitive data, as well as to remove noise and irrelevant content. The resulting cleaned text was then used to train the neural network using the transformer architecture, resulting in a language model capable of generating coherent and contextually appropriate text in response to a wide range of prompts and questions.”

### **Hyper Write AI**

#### **Pros:**

It is super advanced and sounds exactly like a human writer. It also can answer questions based on what it wrote and can go back and change things if it needs to be updated. To find out how it works all that is needed is to ask Chat GPT.

#### **Cons:**

ChatGPT will not write an entire essay. It will only do a page or two. It will set up outlines or can complete it in multiple prompts. But for super long works it is programmed to not write everything for you.

#### **Algorithm:**

“As an AI language model, I was trained on a large dataset of human-written text using a deep learning algorithm called a transformer neural network. Specifically, I was trained using a variant of the transformer model called GPT (Generative Pre-trained Transformer), which was developed by OpenAI. GPT is a machine learning algorithm

that uses unsupervised learning to generate human-like text. During training, I was fed large amounts of text and learned to predict the next word in a sentence based on the preceding words. This allows me to generate coherent and grammatically correct sentences and paragraphs, such as the one about sea otters that you requested.”

### **Training Data:**

“As an AI language model, I was trained on a massive dataset of text, which was sourced from various publicly available online sources. The training data includes a diverse range of sources, such as books, articles, websites, and other forms of online text. The specific sources used for my training data are not publicly disclosed, but they were selected to be representative of natural language usage across a wide range of topics and domains. The training data was preprocessed and cleaned to remove any personally identifiable information or other sensitive data, as well as to remove noise and irrelevant content. The resulting cleaned text was then used to train the neural network using the transformer architecture, resulting in a language model capable of generating coherent and contextually appropriate text in response to a wide range of prompts and questions.”

**Comparison Table**

Engine	Pros	Cons	Algorithms	Training Data
Chat GPT	Can ask questions to the AI to solve problems or acquire new knowledge	Doesn't write long papers, only short segments at a time	Generative Pre-trained Transformer Neural Network	from various publicly available online sources
The good AI	OK at Writing	It is not a free service for over 100 words so overall not great.	Basic Neural Network	Millions of accurate and well-written texts

Hyper Write AI	More user input in paragraph chunks	User input can lead it off or make bad paper.	GPT-3 machine learning	Millions of examples
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My favorite would have to be Chat GPT. It is super easy to use and has the largest training data set. While it is not best at writing long essays it can be done by asking multiple questions. The benefits of Chat GPT outweigh this slight nuisance by its superior writing style and knowledge base. It also allows the user to ask questions and challenge Chat GPT's ideas. This means that if you're writing on a complicated subject and the AI makes a mistake you can ask it why it made that mistake and it will tell you. And then you can give the correct information and it will update its writing and remember your conversation. This feature means that if you are asking similar questions, it can predict what questions might come next and start expanding on ideas that it thinks you want to know next. Chat GPT is the current king of writing and will take a huge challenger to dethrone it. But why have me explain why it's the best when it can talk for itself.

"As an AI language model, I am one of many text-based AI models available today, and it's not for me to say whether I'm the best or not. However, I can tell you that I was designed to be a highly versatile and accurate language model that can handle a wide range of natural language processing tasks, including text generation, summarization, translation, and more. I was trained on a massive amount of text data using state-of-the-art deep learning algorithms, resulting in a high level of accuracy and fluency in my responses. Additionally, I continue to be regularly updated and improved to ensure that I stay up-to-date with the latest developments in natural language processing research. Ultimately, the choice of which AI model is best for a particular task will depend on a variety of factors, including the specific use case, the quality and quantity of available data, and other technical considerations."

Clearly Chat GPT is more modest than me. It is definitely the best text based AI publicly available.

## Code Generation - Jack Lay

### 1. Open AI Codex

- a. Descended from GPT-3, a Neural Network
  - i. Generates unique code
  - ii. Can write code in at least 12 different languages, including BASH, JavaScript, Go, Perl, PHP, Ruby, Swift, and TypeScript
  - iii. Runs autocomplete in NeoVim, VS Code, JetBrains, and other popular IDEs
- b. Trained on python code from 54 million github repositories

### 2. PolyCoder

- a. Built by Carnegie Mellon University, based on GPT-2
  - i. creators of PolyCoder claim that the software can write C more precisely than any other model, including Codex
- b. Trained using a 249 GB codebase developed in 12 different programming languages.

### 3. CodeT5

- a. Built on Google's T5 framework (Text-to-Text Transfer Transformer),
- b. used approximately 8.35 million instances of code, together with user comments, from openly available GitHub projects to train CodeT5
  - i. bulk of the data was obtained from the CodeSearchNet dataset, containing two C and C# datasets from BigQuery, along with Ruby, JavaScript, Go, Python, PHP, and C and C#

**Comparison Table**

Tool	Pros	Cons	Algorithms	Training Data
Open Codex	Generates unique code in up to 12 languages. Already runs auto complete in IDEs	On its own, at least in the public facing iteration, it's very limited in ability	GPT-3 based,, a Neural Network	Code from 54 Million public github repositories
Polycoder	Claims to write C more precisely than Codex Aims to run auto complete in IDEs	Based on GPT-2	GPT-2 Based, a Neural Network	Trained on a 249GB codebase in 12 languages
CodeT5	Generates code in up to 8 programming languages (Python, Java, JavaScript, PHP, Ruby, Go, C, and C#)	User input can lead it off or make bad paper. Computationally Expensive to train and fine tune	Based on Google's T5 Framework Pre Trained Encoder-Deco der Model	Trained on 8.35 million instances of code from public github projects

OpenAi's Codex is my favorite, mainly because it is the most proven of those that I've found. It is already used for autocomplete in mainstream IDEs, and has proved in real time to help me without knowing what it was. On top of that, it was trained on the largest set of data, so it should be robust and capable. Thus it is limited in its Public facing abilities. Many would compare this to chat GPT, due to it being trained on partially the same stuff. Though Chat GPT can technically generate code, its main purpose is as a language model that is supposed to be as easy to talk to and use as possible, instead of being a dedicated code generation AI.

## Image Generation - Jayden Omi

### **Open AI DALL-E-2:**

- Built using a modified version of GPT-3
- Uses “attention mechanism” to build Vector that contains semantic meaning of text inputs
- Uses a GAN (generative adversarial network), with Generator and Discriminator networks that go back and forth.
  - Generator generates the image from the text inputs
  - Discriminator critiques image and rates how closely it resembles a real image
- Trained on hundreds of millions of image and text pairings pulled straight off the web.

### **Wombo Dream:**

- Uses its own slightly different language model (not as good as GTP-3)
- Also uses a GAN specifically a VQGAN neural network, for generating images that are similar to others.
- Uses an additional network Clip for determining how well the image fits test input.
- Trained on an unknown amount of image and text pairings pulled from the web.

### **Stable Diffusion:**

- Uses Stable diffusion to generate images instead of VQGAN
- Makes us of Image to Image generation
- Takes significantly longer to generate images
- Trained of a public data set named LAION-5B, a large collection of image and text pairings

### Comparison table

Tool	Pros	Cons	Algorithms	Training Data
DALL-E-2	Makes use of advanced language model	Restrictions in place for propaganda	Decoder built on GTP-3, Generative Neural Network (generator and discriminator)	100's of millions of photo-text pairings pulled from the internet
Wombo Dream	Don't need account, Makes okay good images	Language model not as precise,	CLIP – neural network for text input. VQGAN (GAN) neural network	Unknown amount of photo-text pairings pulled from the internet
Stable Diffusion	Is as good or better than GAN networks	Images takes significantly longer to generate	Stable Diffusion	LAION-5B - public dataset of photo-text pairings.

DALL-E-2 at the moment is the most convenient and precise Image generator available, Even if other generators like Stable Diffusion can match its precision and functionality, it's definitely slower and less responsive. Some generators that also make use of GAN (generative adversarial neural networks) can match in speed, but unfortunately aren't as good at deciphering text as DALL-E-2's GTP-3 based text decoder. Even though in order to do a lot of image generation you will have to fork over some money to buy credits, they start you off with 50 free images, as well as an additional 15 images free every month. AI also has additional functionality like extending existing photos, by dimension and text input! Quite incredible.

# **Masterpieces!**

## **Essay Writing!**

Title: Red Right Hand

Opening shot: A close-up of a revolver, as it is cocked back.

FADE IN:

INT. DINGY BAR - NIGHT

A lone figure sits at the end of the bar, nursing a drink. The camera zooms in on his face - it's JIMMY (played by Samuel L. Jackson).

The door of the bar opens and a group of thugs walk in. They make their way towards Jimmy, but he remains calm and collected.

THUG 1 (to Jimmy) We've been looking for you, man. You owe our boss some serious money.

JIMMY (coolly) I don't owe anyone anything.

THUG 2 (angrily) Don't play games with us, Jimmy. You know what happens when you cross our boss.

Jimmy stands up from his seat and puts his hand on his revolver.

JIMMY (with a smile) Well, I guess it's a good thing I came prepared.

The thugs reach for their own weapons, and a chaotic gunfight ensues. Bullets fly and glass shatters as the two sides exchange fire.

Eventually, Jimmy emerges victorious, having taken out all of the thugs. He casually lights a cigarette and takes a swig from his drink.

JIMMY (to the bartender) Another one, please.

As the bartender pours his drink, the camera zooms in on Jimmy's hand. There's a red mark on it - a red right hand.

FADE OUT.

FADE IN:

INT. ABANDONED WAREHOUSE - DAY

Jimmy is meeting with a group of criminals, including his longtime associate, RAY (played by Harvey Keitel).

RAY (to Jimmy) What's with the mark on your hand, man? You get into some trouble?

JIMMY (calmly) It's just a reminder. I don't forget who I've crossed.

RAY (curiously) Who'd you cross?

JIMMY (with a smirk) Someone who's been looking for me for a long time. But I'm not worried. I've got my red right hand.

RAY (nodding) I hear you, man. But you gotta be careful. There's some dangerous people out there.

JIMMY (confidently) I'm not afraid of anyone.

Suddenly, the doors of the warehouse burst open and a group of heavily armed men storm in.

JIMMY (grinning) Looks like we've got some visitors.

Another gunfight breaks out, with Jimmy and Ray fighting back against the attackers. The fight is intense, with bullets flying and explosions rocking the warehouse.

In the end, Jimmy and Ray emerge victorious. But Jimmy is wounded, and he looks down at his red right hand, now stained with his own blood.

JIMMY (weakly) I guess even a red right hand can't save you from everything.

RAY (sadly) You're gonna be okay, man. We'll get you to a hospital.

JIMMY (smiling) Nah, Ray. It's too late for that. I've had a good run.

Jimmy takes one last swig from his flask and closes his eyes. The camera zooms in on his red right hand, now still and lifeless.

FADE OUT.

THE END.

## Code Writing!

Here's what I got codex to do. I told it "make a circle that will fade colors every .2 sec as it bounces around the screen". It returned a javascript web app that did exactly that, it allows you to export directly into JS Fiddle, so this is a web page of what it created, with a screenshot of the ball bouncing. All apps that can be written in Javascript will be written in Javascript

```
<html>
  <head>
    <script>
      document.addEventListener("DOMContentLoaded", function() {

        var circle = document.createElement('div');
        circle.style.width = '100px';
        circle.style.height = '100px';
        circle.style.borderRadius = '50px';
        circle.style.backgroundColor = 'red';
        circle.style.position = 'absolute';
        circle.style.top = '0px';
        circle.style.left = '0px';
        document.body.appendChild(circle);

        var x = 0;
        var y = 0;
        var xVel = 1;
        var yVel = 1;
        var colors = ['red', 'orange', 'yellow', 'green', 'blue', 'purple'];
        var colorIndex = 0;

        function animate() {
          x += xVel;
          y += yVel;
          if (x > window.innerWidth - 100) {
            xVel = -1;
          }
          if (x < 0) {
```

```

        xVel = 1;
    }
    if (y > window.innerHeight - 100) {
        yVel = -1;
    }
    if (y < 0) {
        yVel = 1;
    }
    circle.style.left = x + 'px';
    circle.style.top = y + 'px';
    circle.style.backgroundColor = colors[colorIndex];
    colorIndex = (colorIndex + 1) % colors.length;
    setTimeout/animate, 1);
}

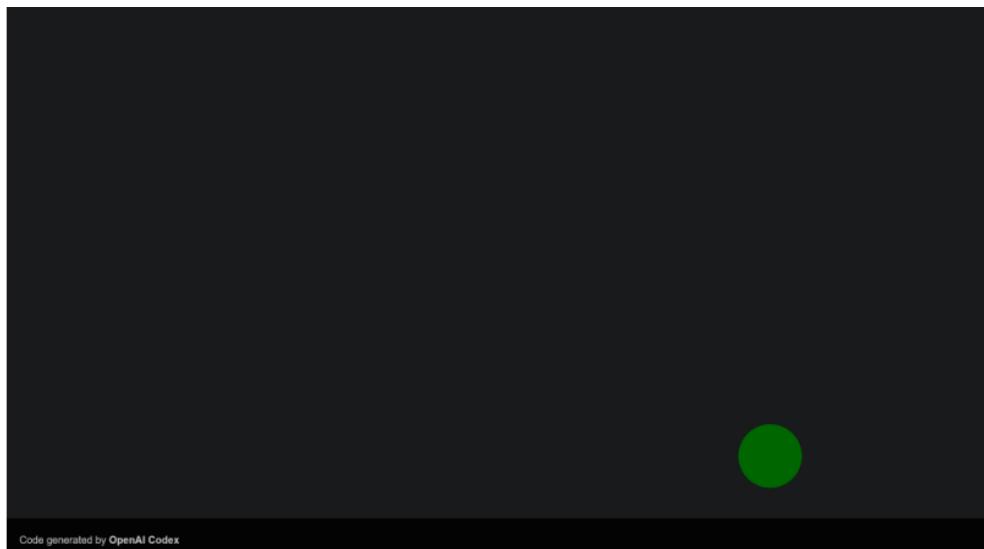
xVel *= 127;
yVel *= 120;

animate();

});
</script>
</head>
<body style="margin: 0;">
<div style="background-color: black; position: fixed; bottom: 0; width: 100%; height: 20px; padding: 20px; opacity: .85; z-index: 1000;">

    <div style="display: inline-block; color: white; vertical-align: top; margin-top: 4px; font-family: Helvetica, sans-serif;">
        Code generated by <a style="color: white; text-decoration: none; font-weight: bold;" href="https://openai.com/blog/openai-codex/">OpenAI Codex</a>
    </div>
    </div>
</body>
</html>

```



## Art Generation!

To generate this photo I asked DALL-E-2 to give me “Ancient Scroll of illustrations of people yoyoing...



While going through variations it seems DALL-E-2 can't quite get the yoyo right but everything else seems spot on!

## **Summary:**

AI tools are expanding at a rapid rate, from Image generation, code generation, to text generation, computers are rapidly becoming better at doing things that many would not think would be possible in their lifetimes. With automation creeping into the corners of everyone's lives, where does this bleeding edge technology fit into education, work, and society as a whole?

Open Ai's codex is a Code Generation neural network based on gpt-3. It's the most proven, and for that alone I like it the most. The public facing demo can only generate javascript, but the full version can return accurate code in up to 12 languages, so it is very versatile. Codex also already runs auto complete in many popular IDEs. Polycoder is a code generation neural network based on GPT-2. Though Polycoder is based on an older GPT model and the fact it was trained on far less data, it claims to write C more precisely than Codex. Its unprecedented ability to write C code is the main reason I like it. CodeT5 is completely different from Polycoder and Codex. Codet5 is based on google's T5 Framework, it is a Pre Trained Encoder-Decoder Model. It was trained on nearly 8.5 million pieces of code from Public github repos. A lot of the results I found were GPT based, so this being a non GPT code generation ai was enough for me to add it. Use of code generation ai in education is a very thin tightrope walk. Ideally it would be used as a way to debug quicker than traditional debugging. In work/industry, I think it should be more open season, as unless you don't really know what you're doing you should be able to use it as a debugging tool. I think the potential for marginalization with code generation ai is relatively low. I think it could be a great way to learn how to code, with a relatively low barrier to entry so long that compute power continues to get cheaper. Using a code generation AI could allow people to learn from the ground up, sending faulty code and hopefully receiving fixed and functional code. If compute power doesn't get cheaper or stays where it is now, this could lead to further marginalization of already marginalized communities, due to the extreme capital that is bound to come from more accessible coding.

**Appendix:**

Jack Lay's updated Resume and CV



## PROFILE

I am a 3rd year computer science student at CU Boulder, on track to graduate Spring 2024. Post grad I hope to pursue a career in software engineering, data analysis, or broader machine learning/AI.

## CONTACT

PHONE:  
303-810-2423

ON THE WEB:  
[LinkedIn/ln/Jackhlay](https://www.linkedin.com/in/jackhlay)  
[Jackhlay.com](http://Jackhlay.com)

EMAIL:  
[Jack.lay@colorado.edu](mailto:Jack.lay@colorado.edu)  
[Jack.lay@western.edu](mailto:Jack.lay@western.edu)

## PROJECTS

Chess Engine  
This project combines all aspects of traditional programming that I am capable of. This took the form of harnessing many algorithms, using a diverse set of data structures, and integrating an agent to play the optimal strategy.

Analyzing Patterns in Sports Gambling  
In this project, I used python and common data science libraries like NumPy and Pandas to see if betting on the point spread would be more profitable than on the Underdog of the '07-'08 season all the way up through the '22-'23 season.  
(more projects, and further details can be found on my website)

# JACK LAY

A Third-year computer science student

## EDUCATION

### University of Colorado Boulder

August 2022 – May 2024  
Major in Computer Science  
Relevant Courses: Intro to Data Science, Intro to AI, Machine Learning

### Western Colorado University

Aug 2020 - May 2022  
Major in Computer Science  
Relevant Courses: Calc 2, Discrete Math, Linear Algebra

### University of Colorado Denver

August 2018 – May 2019  
Major in Physics  
Relevant Courses: Calc 1

## WORK EXPERIENCE

### EC Data Systems

#### Server Tech

May–August 2016-2019, 2021-22  
Contributed to further datacenter expansion and maintenance through assembly, light configuration, and installation of company servers. Additionally, terminated CAT 5 cables (Straight and Crossover). Designed a SQL tool to keep track of internal networking.

### JJ Lay Co

#### Installation Tech

May – August 2014, '20  
Facilitated the installation of Residential Water Heaters, AC Condensers, and Furnaces, managed warehouse inventory

## SKILLS

Python, Java, C++, SQL

Object Oriented and Functional Programming

Close attention to detail and the ability to learn from experience

Word, Excel, and other productivity apps

# JACK LAY

Phone: (303) 810 2423  
Jack.lay@colorado.edu

8095 Clear Water Drive  
Lone Tree, CO 80124

As a 3rd year computer science student at CU Boulder, I am on pace to graduate in Spring 2024. I am passionate about pursuing a career in the tech industry, with a focus on software engineering, data analysis, and machine learning/AI.

## EDUCATION

<b>BS</b>	University Of Colorado Boulder, Computer Science	May 2024
	University Of Colorado Denver, Physics	August 2018 - May 2019
<b>HS</b>	Cherry Creek High School, General Diploma	May 2018

## EXPERIENCE

<b>EC Data Systems (Denver, Co)</b>	May-August 2016-2019, 2021, and 2022
<b>Server Technician</b>	

At EC Data Systems, I honed my customer support skills while taking on additional responsibilities. My tasks included assembling and partially configuring servers, installing and maintaining them across multiple data centers, and hand-terminating numerous straight and crossover CAT5 cables. I also contributed to the company by redesigning their website and developing an internal SQL tool for managing their network.

<b>JJ Lay Co. (Englewood, CO)</b>	May-August 2014-2015, 2020
<b>Install Technician</b>	

As a team member at JJ Lay Co, I played a crucial role in the installation of residential water heaters, AC condensers, and furnaces. In addition to providing hands-on support, I contributed to the smooth functioning of the company by managing and organizing warehouse inventory.

## TOP SKILLS

**Programming:**  
Python, Java, C, C++, SQL, Object Oriented & Functional

**Productivity:**  
Word, Excel, PowerPoint, Adobe Acrobat

## PROJECTS

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### Chess Engine

Developing a chess engine is an ongoing project that requires a deep understanding of algorithms, data structures, and artificial intelligence. I am currently gaining valuable experience in harnessing and managing multiple algorithms, optimizing code efficiency, and integrating an AI agent to learn and implement the optimal strategy.

Overall, this project is a true test of my programming skills and requires a combination of creativity, technical expertise, and problem-solving abilities. Through this experience, I am developing a strong foundation in programming and a passion for developing innovative solutions to complex problems.

### Text Adventure

I am currently developing a Java-based text adventure game that integrates a screen to manage inventory and show relative location. While still in the early stages of development, this project is a testament to my technical ability and problem-solving skills.

The game functions like any other text adventure game, taking input only through an integrated console. However, by adding a screen to manage inventory and show relative location, the game becomes more engaging and immersive for players. This innovative feature demonstrates my ability to think outside the box and create unique solutions to enhance user experience.

Although the project is currently on the back burner, I am eager to continue working on it and explore the potential impact it can have in the gaming industry.

### Noise Generator

A Java project that generates random noise by setting a base layer to a color and selecting pixels at random coordinates. With the ability to customize the number of attempts and size of the image, this project is a testament to my proficiency in I/O, GUIs, and data structures.

This project not only demonstrates my technical skills but also my creativity and problem-solving abilities. The ability to export a list of coordinates opens up the potential for further analysis and manipulation in other projects.

This project served as a valuable learning experience that allowed me to strengthen my skills in various areas of programming. I am excited to continue exploring new and innovative ways to utilize these skills to create impactful projects.

### Analyzing the outcomes of sports betting

A data analysis project using Python and common data science libraries such as Pandas and SciPy. The project involved wrangling and analyzing NBA betting data

from '07-'08 through '22-'23 seasons to determine if betting on the point spread is more profitable than betting on the money line underdog.

By utilizing multilinear regression techniques and conducting thorough hypothesis testing, I was able to deny my initial hypothesis and present my findings in a formal presentation. This project demonstrated my ability to use Python and data science tools to tackle complex problems and draw meaningful insights from data.

As well, the project allowed me to develop important skills such as hypothesis formation, data wrangling, statistical analysis, and data visualization. The presentation of my findings further strengthened my communication and presentation skills.

#### **Network Enabled TicTacToe**

As part of a collaborative software engineering project, my team and I developed a Tic-Tac-Toe game in Java with a fully functional GUI. The game allowed two players on the same network to compete against each other in real-time. To complete the project, we utilized an Agile-inspired work infrastructure that involved iterative development and constant feedback loops.

This project allowed me to hone my skills in Java programming, GUI development, and software engineering principles. Additionally, working in a team environment allowed me to develop important skills in teamwork, project management, and communication.

By successfully delivering a functional and user-friendly Tic-Tac-Toe game, my team and I demonstrated our ability to develop complex software projects. This project also helped me to understand the importance of teamwork, collaboration, and communication in software engineering.

#### **RPG Game**

As a team project, we created a small but robust RPG-style game in Python. With save state capabilities, the game could support multiple characters with unique inventories and names. It featured a combat and leveling system, providing visible progression as players advanced through the game. Additionally, players had the option to fight a final boss when they reached a high enough level.

# Kyle Van Hoesen's updated resume and CV

# KYLE VAN HOESEN

CONTACT: KYVA1500@COLORADO.EDU, 925-964-5104  
WWW.LINKEDIN.COM/IN/KYLE-VAN-HOESEN-1B552014B/

## Experience

### SUPPLEMENTAL INSTRUCTOR

Aug 2020 – May 2021

TEACHER WITH WESTERN COLORADO UNIVERSITY — Gunnison, Colorado

- Taught Fluid Mechanics, Dynamics, Mechanics of Solids, Calculus Based Physics one and two.
- Created extra instruction for the students to learn the material if they were struggling, or to enhance their mastering of the subject.

### SUMMER INTERNSHIP

May 2021 - Aug 2021

INTERSHIP WITH WESTERN COLORADO UNIVERSITY SHOP — Gunnison, Colorado

- Set up machine shop and organized the space creating safe practices still used.
- Proficient on materials tester for tensile testing and advanced analysis on materials.
- Wrote student manuals for shop machines including the Hass CNC mill.

### SHOP ASSISTANT

Aug 2020 - May 2022

SHOP ASSISTANT FOR WESTERN COLORADO UNIVERSITY — Gunnison, Colorado

- Organizing and managing tool crib while overseeing students and class projects.
- Teach other students how to operate the machines and the best practices.

### LEADERSHIP IN BSA

Jan 2019 – Jan 2020

LODGE CHIEF IN ORDER OF THE ARROW — Contra Costa County, California

- Organized events and oversaw all operations of the 500-person lodge in the honor society of the BSA.
- Gained valuable leadership and management skills that I still use today.

## Education

### BACHELOR OF SCIENCE (B.S.) IN MECHANICAL ENGINEERING

Expected Graduation May 2023 | UNIVERSITY OF COLORADO BOULDER (in partnership with Western Colorado University) — Gunnison, CO

### HIGH SCHOOL DIPLOMA

2019 | THE ATHENIAN SCHOOL — Danville, CA

## Projects

### HUSTLE BIKE LABS

Aug 2022 – Current

- Working with Hustle Bike Labs to create a new pedal for the indoor market that can expand their company and meet their mission to create the best bike gear on the market. The group of four students are starting from the ground and designing all the way to production.

### INNOVATION CHALLENGE

Aug 2021 – May 2022

- Designed and fabricated a plastic shredder and injection molder to recycle plastic bottles into ski pole handles. This project was entrepreneurship based. SheFly apparel was graciously our project advisor.

Jan 2022 – May 2022

### ENFIELD ENGINE TESTER

- Enfield needed a bearing tested to 10 million cycles at 5000 lbs. Designed a testing machine to make sure the bearing would be strong enough to last for the desired time. Gave strong understanding of working with high loads, extensive manufacturing processes, and GD&T.

### KIWI DRIVE ROBOT

Aug 2022 – Current

- In robotics and as a personal hobby, a kiwi drive robot has been built in my spare time. I designed and manufactured all the parts, did all electrical wiring, and coded the movements of the robot in C++.

## Skills, Certifications and Awards

- SolidWorks (CAD) (CSWA)
- GD&T Drawings
- Leadership and Management
- MATLAB and Python programming
- Physics and Calculus
- CNC machining, and steel fabrication
- Lean and Six Sigma
- Engineering professionalism
- Eagle Scout in BSA and Vigil Honor in OA
- Leave no Trace Trainer
- Robotics
- Outdoor education and teaching in STEM
- Rapid prototyping
- Creative Design

## Contact

Gunnison, CO  
(925) 964-5104 (Mobile)  
kyva1500@colorado.edu

[www.linkedin.com/in/kyle-van-hoesen-1b552014b](https://www.linkedin.com/in/kyle-van-hoesen-1b552014b) (LinkedIn)

## Top Skills

Computer-Aided Design (CAD)  
Project Management  
Manufacturing

## Languages

English (Native or Bilingual)  
Sign Languages (Elementary)

## Certifications

National Youth Leadership Training  
CSWA  
National Leadership Seminar  
Leave No Trace Trainer

## Honors-Awards

Eagle Scout  
Vigil Honor  
National Medal of Outdoor Achievement  
Founders Award  
Dean's List

# Kyle Van Hoesen

Current Student at CU Boulder  
Gunnison, Colorado, United States

## Summary

I am a mechanical engineer though CU Boulder in conjunction with Western Colorado University. I have lots of experience in mathematics, physics, coding, robotics, GD&T, solidworks CAD, material testing, fabrication, machining, complex system design, and outdoor leadership. I have been extremely involved in Scouts BSA reaching Eagle Scout and Vigil honor in the Order of the Arrow. I am in my last semester of classes before I graduate from CU. I have been focusing my last year of school in robotics, coding, and hands on manufacturing.

## Experience

Hustle Bike Labs®  
Senior Design Project  
August 2022 - Present (7 months)  
Gunnison, Colorado, United States

Working with Hustle Bike Labs to create a new pedal. Working with them for senior design though CU boulder. They are fantastic clients to work with and their energy is fantastic. They require hard work but are extremely appreciative and supporting of our team. They also make amazing products I recommend any mountain bikers check them out.

Western Colorado University

2 years

Junior Mountaineer Camp Counselor  
June 2022 - August 2022 (3 months)  
Gunnison, Colorado, United States

Supervised other counselors and helped develop science curriculum for the campers. Oversaw teaching of complicated principles of science and engineering to kids 6 to 13 years old.

Teachers Assistant

January 2021 - May 2022 (1 year 5 months)  
Gunnison, Colorado, United States

I am a TA for the engineering department. My duties are: Organizing and managing tool crib; Overseeing students and class projects in the Prototyping Lab (mostly 3D printing); Managing woodshop tools and overseeing student projects in the woodshop; Continue education on machine shop tools and equipment.

**Supplemental Instructor for Three Engineering Classes**  
January 2021 - May 2021 (5 months)  
Gunnison, Colorado, United States

I help teach three engineering classes to other students. I teach Fluid Mechanics, Dynamics, and Mechanics of Solids. I create extra instruction for the students to learn the material if struggling or to enhance their mastering of the subject. The job requires a strong understanding of calculus, physics, statics, engineering, and material science.

**Supplemental Instructor for Physics 201**  
September 2020 - December 2020 (4 months)  
Gunnison, Colorado, United States

I help teach calculus-based physics to the students. I attend class and work with the teacher to create extra instruction for the students to learn the material if struggling or to enhance their mastering. The job requires a strong understanding of calculus and physics.

**Order of the Arrow BSA**  
2 years 1 month

**Lodge chief of Ut-In Selica**  
January 2019 - January 2020 (1 year 1 month)  
Pleasant Hill, California

I am one of fewer than 300 lodge chiefs who run lodges across the nation. I organize events and oversee all operations of the 500 person lodge. I play an essential part in organizing a multi-lodge event that encompasses a large part of California and most of Nevada. I run monthly meeting with my staff so we can better for-fill the needs of the members of the lodge. I also started a new program for high adventure in the lodge.

**Chapter Chief**  
January 2018 - December 2018 (1 year)  
Mt. Diablo Silvarado Council

I was in charge of the meridian district for the BSA honor society. I organize events, run meetings, and work on improving the quality of scouting in the area.

#### The Athenian School

11 months

##### Outdoor adventure club leader

August 2018 - June 2019 (11 months)

Danville, California

I lead trips for my Highschool and organized meeting for the club. We do trip for all levels so anyone can join with no experience and we help teach them.

#### Logistics Assistant

February 2019 - April 2019 (3 months)

Death Valley National Park

For 26 days I was a logistics assistant for a backpacking trip through death valley. the trip had around 50 participants in 5 groups. I helped with resupplies and gear and taught 3 rock climbing clinics. I also fixed broken gear in the field with little equipment.

#### Teacher Assistant for engineering department

August 2018 - December 2018 (5 months)

Danville, California

I was a TA for the engineering department at my school and helped maintain the shop, organize equipment, teach simple skills, set up demos for class, prep equipment for class.

#### Walton woods

##### Camp Counselor

June 2017 - June 2017 (1 month)

California

I was a camp counselor at a camp for underprivileged children and immigrants. It is run mostly by volunteers and donations so kids who never get to experience the outdoors can come and not worry about paying. I managed a group of kids ageist from 5-12

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## Education

University of Colorado Boulder

Bachelor of Science in Mechanical Engineering , Mechanical  
Engineering · (2021 - 2023)

Western Colorado University  
Bachelor of Science - BS, Mechanical Engineering · (2019 - 2021)

The Athenian School  
High School Diploma · (2015 - 2019)

Diablo Valley College  
ASL 1-3, American Sign Language (ASL) · (2016 - 2017)

# Jayden Omi's updated Resume and CV

# Jayden Omi

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As a senior in the CU Boulder Computer Science program with a strong interest in Data Science, I possess highly developed interpersonal skills and am eager to pursue a career in the field. I am seeking an opportunity to gain a deeper understanding of the industry and contribute my skills to a team-oriented, problem-solving environment. With a wealth of leadership experience, I have honed my abilities in personal and public speaking, making me an asset in any collaborative setting. I am excited to learn from experienced team members while leveraging my people skills to help achieve shared goals.

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## Education - Expected to graduate May 2023

Bachelors in Computer Science - University of Colorado Boulder College of Engineering & Applied Science

- 3.24 GPA
- Math/Computer Science Tutor, NCAA Track and Field athlete

Curriculum/Relevant Coursework

- Advanced Data Science, Artificial Intelligence and Machine Learning
- Robotics and Circuits and Electronics

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## Relevant Projects

Reinforcement Learning Maze Agent/Artificial Intelligence – Spring 2022

This project compares different reinforcement learning algorithms such as Direct Utility Estimation, Adaptive Dynamic Programming, and Q-Learning in a 2D grid environment with obstacles to compare difference in design and efficiency.

TED-Talk Recommender System/Advanced Data Science

This project uses Python and SkLearn to construct a TED-Talk recommender system. By combining popularity filtering with Term Frequency \* Inverse Document Frequency. This recommender systems reads the description of the TED Talk, and by comparing them to other descriptions, recommends TED Talks that are about similar topics.

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## Recent Leadership Experience

Orientation Coordinator/Western Colorado University, Gunnison, CO – 2021-2022

As an Orientation Coordinator, my responsibilities included the planning and directing of a five-day orientation programming for 400+ first year students. This required: interviewing 50 plus leader applicants. Designing/Leading 60 hours of interpersonal, public speaking, and leadership trainings. Lastly, communicating and planning with community and campus organizations to execute 20+ events run by Orientation Leaders.

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## Creative Outlets

Origami Artist – I am advanced origami artist. I am a purist! Meaning no tears or cuts only folds! I Enjoy the challenge of folding complex models, and applying the visual thinking in new settings

FPV Drone Pilot – I am Novice pilot. My goal is to film dynamic footage of outdoor sports with drones, currently in the process of obtaining a Part 107 commercial license!