

# Learning About Deep Learning, and Maybe a Few Other Things



Franklin Diaz, Cosmic Voyager

# Introduction

What is Deep Learning, Exactly?

The Journey

Visualizations

Sources and Citations



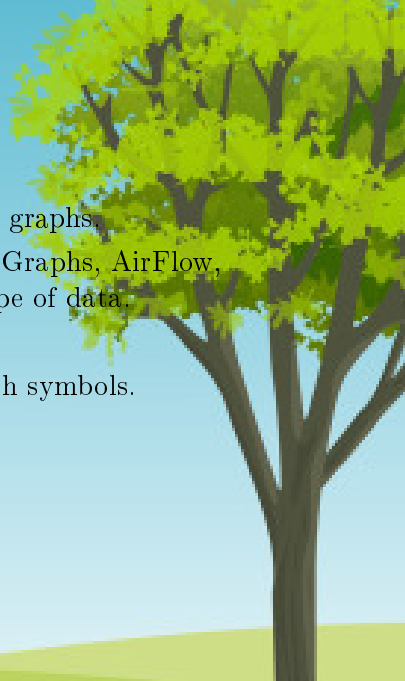
## About Me

- I am a Security Consultant at Palo Alto Networks, cloud and automation for past 2+ years
- Did Data Eng/DevSecOps at Salesforce for 5 years.
- Been going to security conferences for a while.

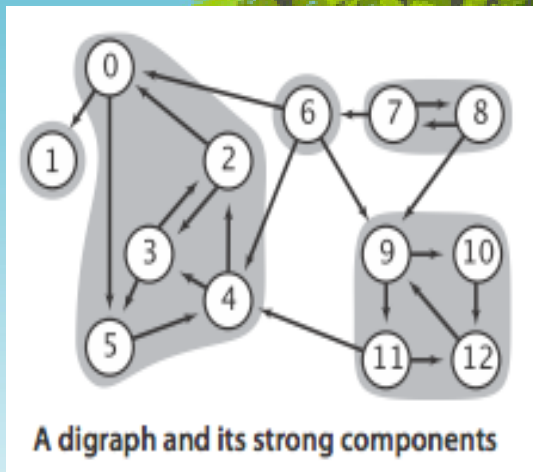
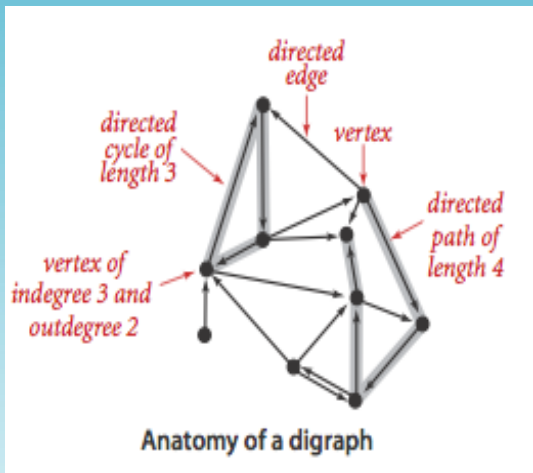


# The Project

- Realized that Terraform can output directed graphs.
- Had done a lot of work at Salesforce with DiGraphs, AirFlow, etc. so I was somewhat familiar with this type of data.
- What can we do with these directed graphs?
- Try to understand all these cool looking math symbols.



# What's a DiGraph?



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# The Rise of Deep Learning

## ARTIFICIAL INTELLIGENCE

Early artificial intelligence stirs excitement.



## MACHINE LEARNING

Machine learning begins to flourish.



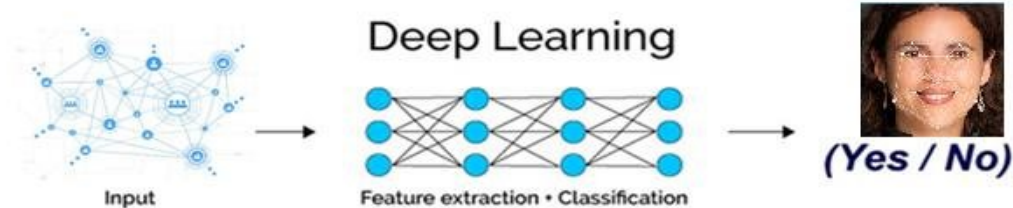
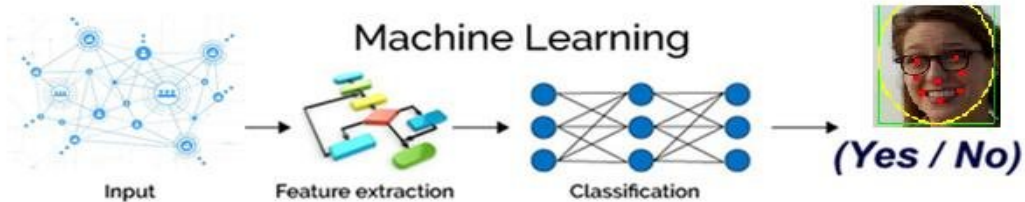
## DEEP LEARNING

Deep learning breakthroughs drive AI boom.



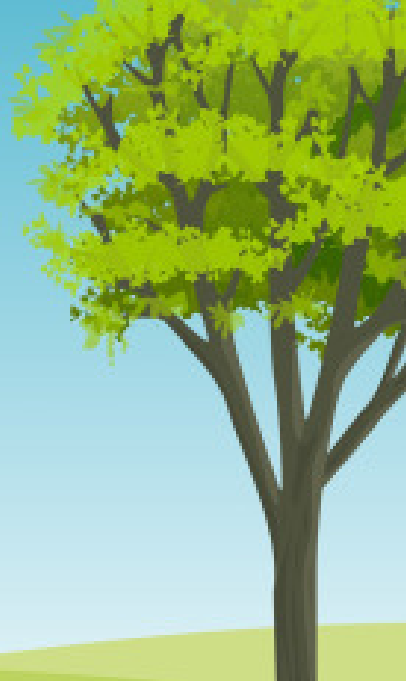
Since an early flush of optimism in the 1950s, smaller subsets of artificial intelligence – first machine learning, then deep learning, a subset of machine learning – have created ever larger disruptions.

## Quick Intro to a Giant Topic





Amazing Tools Available



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# What Have I Gotten Myself Into?

- This is an example of a list.
- Important business information.



# Yak Shaving, Side Quests, Endless Rabbit Holes

- Makefiles and GNU Autotools
- NVIDIA Jetson Nano as cluster nodes
- SLURM cluster scheduler
- OpenMPI for parallel builds
- Docker and Containers
- k8s and Rancher k3s
- Data Version Control [dvc.org](https://dvc.org)
- Storing/accessing data in GCP buckets
- Continuous Machine Learning [cml.dev](https://cml.dev)
- Internal PyPI and Debian/Raspbian mirror (used too much bandwidth on home connection)



## Dot Data Collection

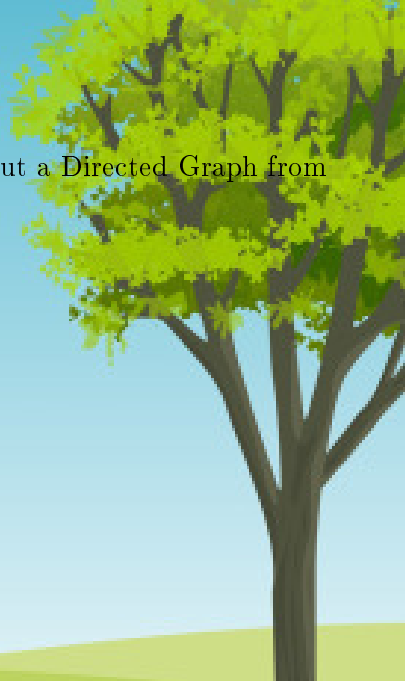
A big barrier to entry was removed by the ability to output a Directed Graph from Terraform. [Click for video](#)

*# Generate a PNG from Terraform*

```
terraform graph | dot -Tpng > graph.png
```

*# Generate vector graphic from Terraform*

```
terraform graph | dot -Tsvg -o graph.svg
```



# Python Data Collection

This became the basis for collection via Python.

[Click for video](#)



# Data Processing

github.com/devsecfranklin/model-html/pull/7

testing #7  
devsecfranklin wants to merge 3 commits into main from dev5-20211118

github-actions bot commented on Nov 19, 2021

```
Creating data directory.  
Downloading the dataset.  
Count: ip 10285  
transport 10285  
port 10285  
server 10285  
dtype: int64
```

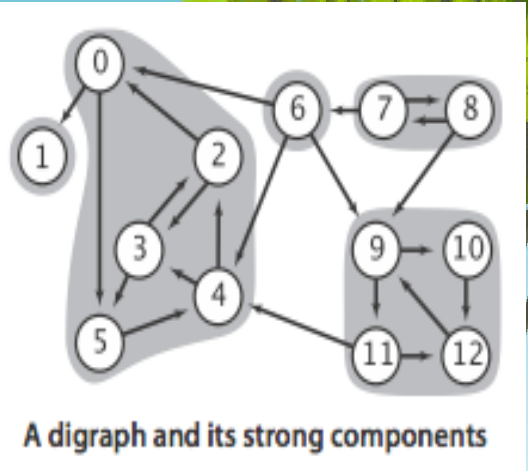
Data sample:

	ip	transport	port	server
0	160.153.63.6	tcp	443	[Apache]
1	35.197.16.105	tcp	80	[Apache]
2	199.19.210.59	tcp	443	[Apache/2.4.10', 'Unix', 'OpenSSL/1.0.1]
3	12.130.77.39	tcp	443	[Apache]
4	129.121.5.237	tcp	443	[Apache]

generating graph object in networkx

github-actions bot commented on Nov 19, 2021

```
Creating data directory.  
Downloading the dataset.  
Count: ip 10285
```



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Figure:

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