MEET TRAVIS – YOUR AI-POWERED TUTOR

Hi! I am Travis. What do you want to learn today?

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Deep Learning Roadmap

Below you'll find the Deep Learning Engineers roadmap - a step-by-step guide on how to become a Deep Learning Engineer. This roadmap covers topics like Nueral Networks, ML/ DL architecture, and training models.

This not a beginners track! Make sure that you have completed the other roadmaps before jumping on this track.

Legend: yellow boxes are key subjects to study. Purple boxes are subtopics. Blue boxes are tools to master. Click on the boxes for recommended learning resources.

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Deep Learning

Papers
- Deep Learning Papers Reading Roadmap
- Zeta Alpha Search Engine for papers

Neural Networks
- Understanding Neural Networks
- Loss Functions
- Activation Functions
- Weight Initialization
- Vanishing / Exploding Gradient Problem

Architectures
- Feedforward neural network
- Autoencoder
- Convolutional Neural Network (CNN) → Pooling
- Recurrent Neural Network (RNN) → LSTM, GRU
- Transformer → Encoder, Decoder, Attention
- Siamese Network
- Generative Adversarial Network (GAN)
- Evolving Architectures / NEAT
- Residual Connections

Training
- Optimizers ← SGD, Momentum, Adam, AdaGrad, Nadam, RMSProp
- Learning Rate Schedule
- Batch Normalization
- Batch Size Effects
- Regularization
- Multitask Learning ← Early Stopping, Dropout, Parameter Penalties, Data Augmentation, Adversarial Training
- Transfer Learning
- Curriculum Learning

Tools
- Tensorflow
- PyTorch
- Keras
- MLFlow

Model optimization (advanced)
- Distillation
- Quantization
- Neural Architecture Search (NAS)

keep exploring and stay up-to-date

🧠 Machine Learning

Concepts, Inputs & Attributes
- Categorical Variables
- Ordinal Variables
- Numerical Variables

Cost functions and gradient descent

Overfitting / Underfitting

Training, validation and test data

Precision vs Recall

Bias & Variance

Lift

Clustering
- Hierarchical Clustering
- K-Means Clustering
- DBSCAN
- HDBSCAN
- Fuzzy C-Means
- Mean Shift
- Agglomerative
- OPTICS

▦ Methods

Regression
- Linear Regression
- Poisson Regression

Classification
- Classification Rate
- Decision Trees
- Logistic Regression
- Naïve Bayes Classifiers
- K-Nearest Neighbour
- SVM
- Gaussian Mixture Models

Supervised Learning

Unsupervised Learning

Ensemble Learning

Reinforcement Learning
- Q-Learning

Association Rule Learning
- Apriori Algorithm
- ECLAT algorithm
- FP Trees

Dimensionality Reduction
- Principal Component Analysis
- Random Projection
- NMF
- T-SNE
- UMAP

🔌 Use Cases
- Sentiment Analysis
- Collaborative Filtering
- Tagging
- Prediction

- Bagging
- Stacking
- Boosting

Machine Learning with Python

Frameworks
- Flask
- Django
- Keras
- Bottle
- Cherrypy

🔨 Tools

Important libraries
- Scikit-Learn
- TensorFlow
- Spacy
- Pandas
- Numpy
- PyTorch
- Matplotlib

Model Deployment

Dockers
Kubernetes
Gradio
MLflow

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Open "https://aigents.co/learn?search=Reinforcement%20Learning&contextBasedSearch=true" in a new tab

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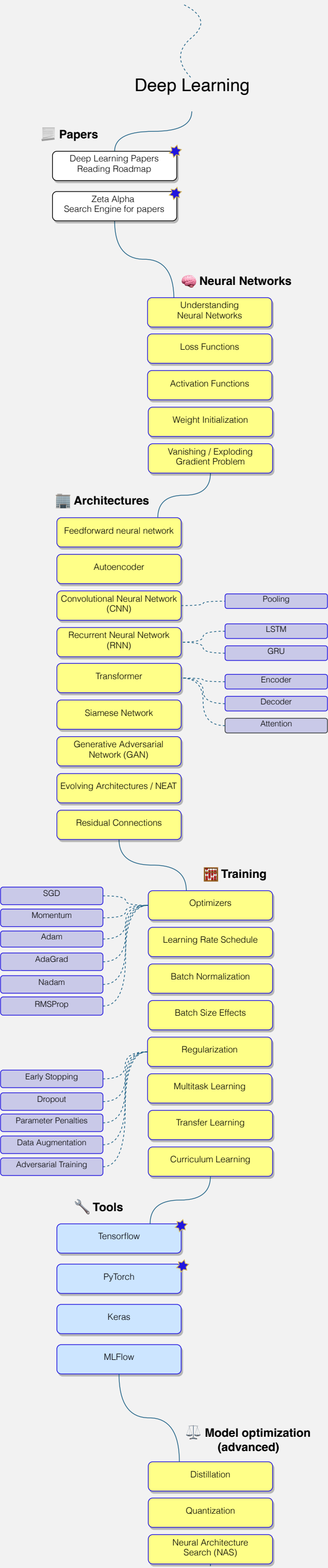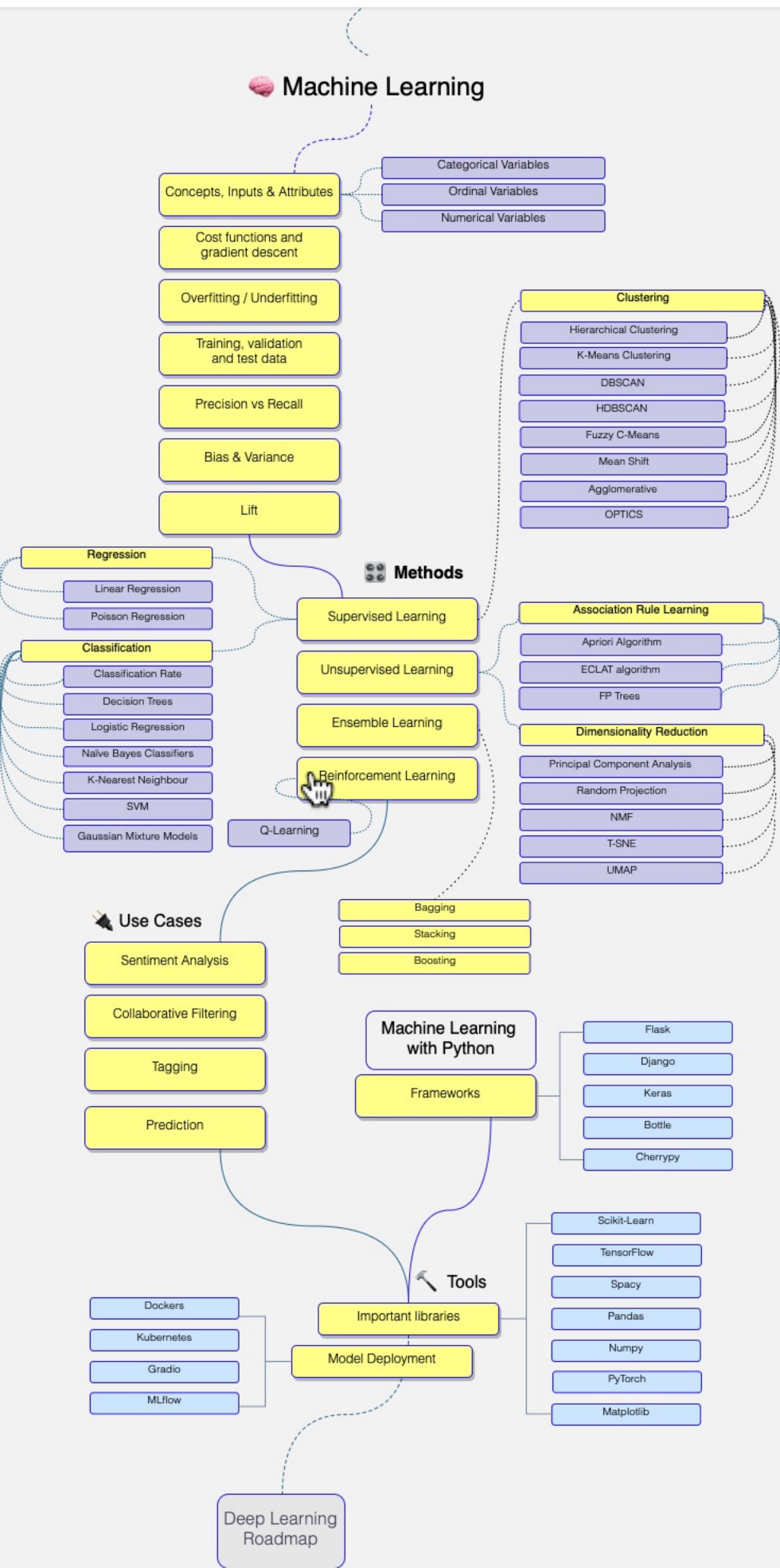
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🗺 Roadmaps

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🍎 Join the Data Science Self-teaching Study Circle

📊 Data Scientist

🎛 Statistics

Normal / Gaussian
Uniform (continuous)
Beta
Dirichlet
Exponential
χ (chi-squared)

Uniform (discrete)
Binomial
Multinomial
Hypergeometric
Poisson
Geometric

Randomness & random variable
Probability distribution
Conditional probability & Bayes theorem

Probability Theory
Continuous distributions
Discrete distributions

iid
cdf, pdf, pmf

Cumulative distribution function
Probability density function
Probability mass function

Summary statistics

Expectation & mean
Variance & standard deviation
Covariance & correlation
Medium & quartile
Interquartile range
Percentile & quartile
Mode

Important Laws

Estimation

Law of large numbers
Central limit theorem

Hypothesis Testing

p-Value
Chi test
F-test
t-test

Maximum Likelihood Estimation
Kernel Density Estimation

Confidence Interval

Monte Carlo Method

📈 Visualization

Matplotlib
plotnine (like ggplot in R)
Bokeh
seaborn
ipyvolume (3D data)

Chart Suggestions
Python
Web

streamlit

Dashboards
BI

Vega-Lite
D3.js
Dash
Tableau
PowerBI

Data Science jobs

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