Awesome Machine Learning Visualizations

Mohamed Kedir Noordeen Follow
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A *curated* list of visualizations/animations of Machine learning algorithms

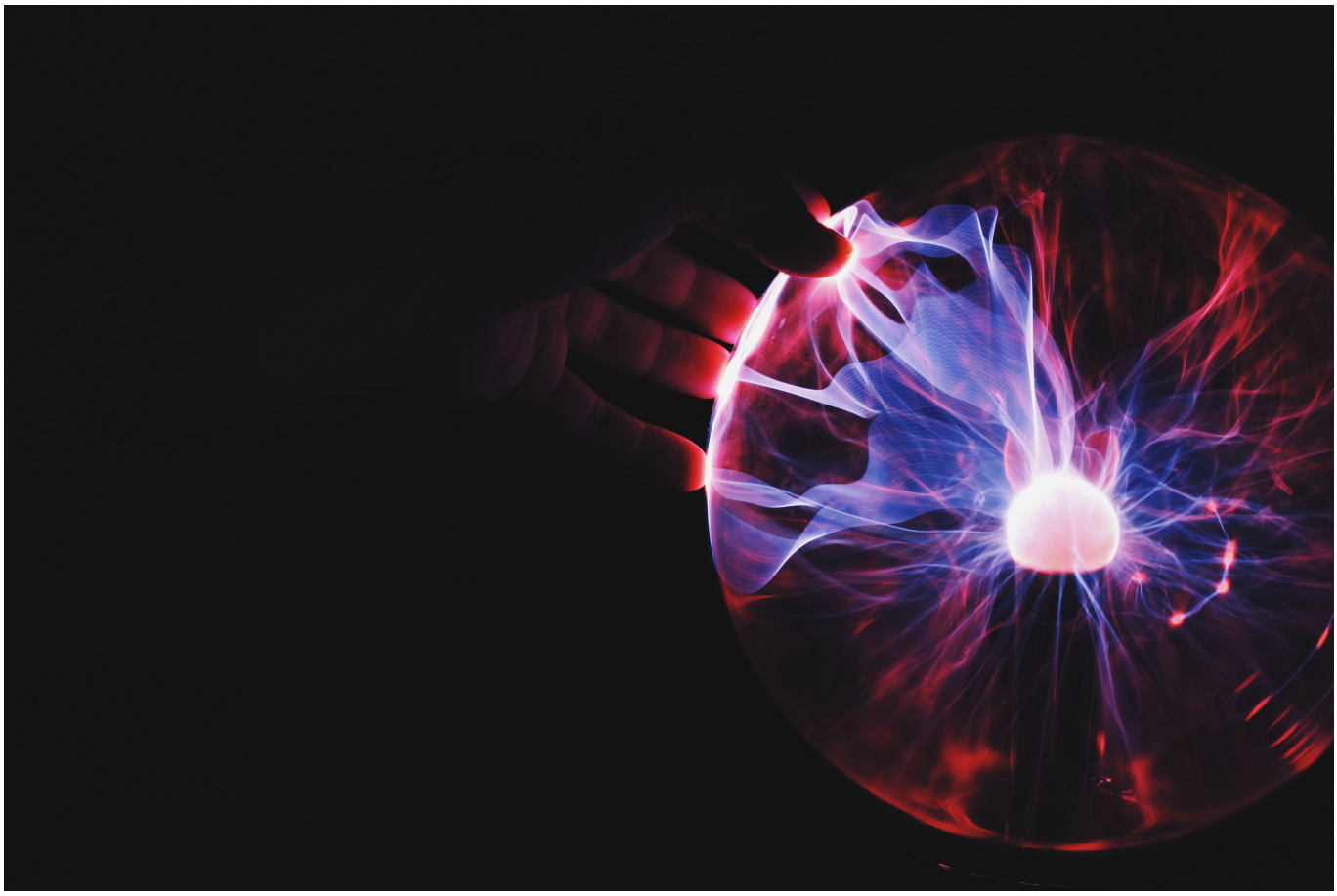

Photo by Ramón Salinero on Unsplash

I have the habit of bookmarking any good visualization or animations that I come across while learning machine learning and took a few efforts to organize it. The following are the curated list of interactive and animated visual explanations of various machine learning algorithms and concepts grouped together concept-wise in no order.

Pictures are worth a thousand words and I feel strongly these interactive visualizations and animations are worth a thousand images. This will be more helpful

1. If you are a beginner like to get better intuition about a concept
2. If you are a trainer looking for a better way to explain a concept.

> *This list is not following any order. You can use this as a reference place to look for interactive visualizations to understand or let others understand a particular concept.*

Mathematics behind Machine Learning

Probability

- Basic Probability
- Compound Probability
- Conditional Probability
- Probability Distributions
- Bayesian Inference
- Central limit theorem
- Monty hall problem
- Basic probability concepts

Statistics

- Statistics Demonstrations
- Frequentist Inference
- Comparing Mean median and mode
- Measures of Central tendency
- Basic statistics concepts
- Kernel density estimation

Calculus

- Derivates visualization
- Derivatives definition
- Derivatives without words
- Basic calculus concepts
- Fourier transforms

Linear Algebra

- Eigenvalues and Eigenvectors
- Basic algebra concepts
- matrix multiplication
- Invitation to another dimension
- Immersive linear algebra
- Matrix decomposition

Machine Learning Algorithms

Regression

- Linear Regression
- Ordinary Least Square Regression
- Regression Analysis

Support Vector Machines

- SVM demo
- SVM with polynomial kernel visualization
- Find the demo at the end of this blog

Decision Trees and Tree ensembles

- Visual Introduction to Machine Learning

- Random Forest demo

Naive Bayes

- Bayes Theorem

KNN

- Stanford cs231n Demo

Clustering

- Visualizing k-means clustering
- Visualizing DBSCAN clustering

Dimensionality Reduction

- Dimensionality reduction
- PCA
- tsne js
- tsne for the web

Deep Learning Algorithms

Neural Networks

- A Visual and Interactive Guide to the Basics of Neural Networks
- A Visual And Interactive Look at Basic Neural Network Math
- Back Propagation Math flow
- Animated demo
- Tensorflow Playground
- NN 3D Simulation
- Neural network zoo
- Parameter optimization
- Initializing neural networks

Convolutional Neural Networks

- CNN Visualization video
- Image kernels
- CNN 3D Simulation
- MNIST 3D Visualization
- Convolutional layer
- Maxpooling layer
- keras.js
- convnet.js

Sequence Models

- Animated RNN and LSTM
- illustrated-word2vec
- Glove demo
- illustrated-transformer
- illustrated-bert
- a-visual-guide-to-using-bert-for-the-first-time
- visualizing-neural-machine-translation-mechanics-of-seq2seq-models-with-attention
- illustrated-gpt2
- recurrentjs

GAN

- GAN Playground

Reinforcement Learning

- Markov-chains

- Reinforcement learning example 1
- Reinforcement learning example 2

Other machine learning concepts

- visual-numpy
- gentle-visual-intro-to-data-analysis-python-pandas
- visualizing-pandas-pivoting-and-reshaping
- Model tuning and the Bias-variance tradeoff
- L2 Regularization

General Resources

- explorables
- Explained visually
- Seeing Theory
- distill pub
- jalammar github
- desmos
- geogebra
- Collection of Interactive Machine learning examples
- Teachable Machine learning
- AI notes

GitHub version is here! Feel free to give a pull request if you like to add any visualizations that I had missed or share it in the comments.

I hope it helps! Connect with me here!