

## i.am.ai AI Expert Roadmap

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Roadmap to becoming an Artificial Intelligence Expert in 2022



Below you find a set of charts demonstrating the paths that you can take and the technologies that you would want to adopt in order to become a data scientist, machine learning or an AI expert. We made these charts for our new employees to make them AI Experts but we wanted to share them here to help the community.

If you are interested to become an AI EXPERT at [AMAI](#) in Germany, or you want to [hire an AI Expert](#), please say [hi@am.ai](mailto:hi@am.ai).

## Note

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👉 An **interactive version with links to follow** about each bullet of the list can be found at [i.am.ai/roadmap](https://i.am.ai/roadmap) 👉

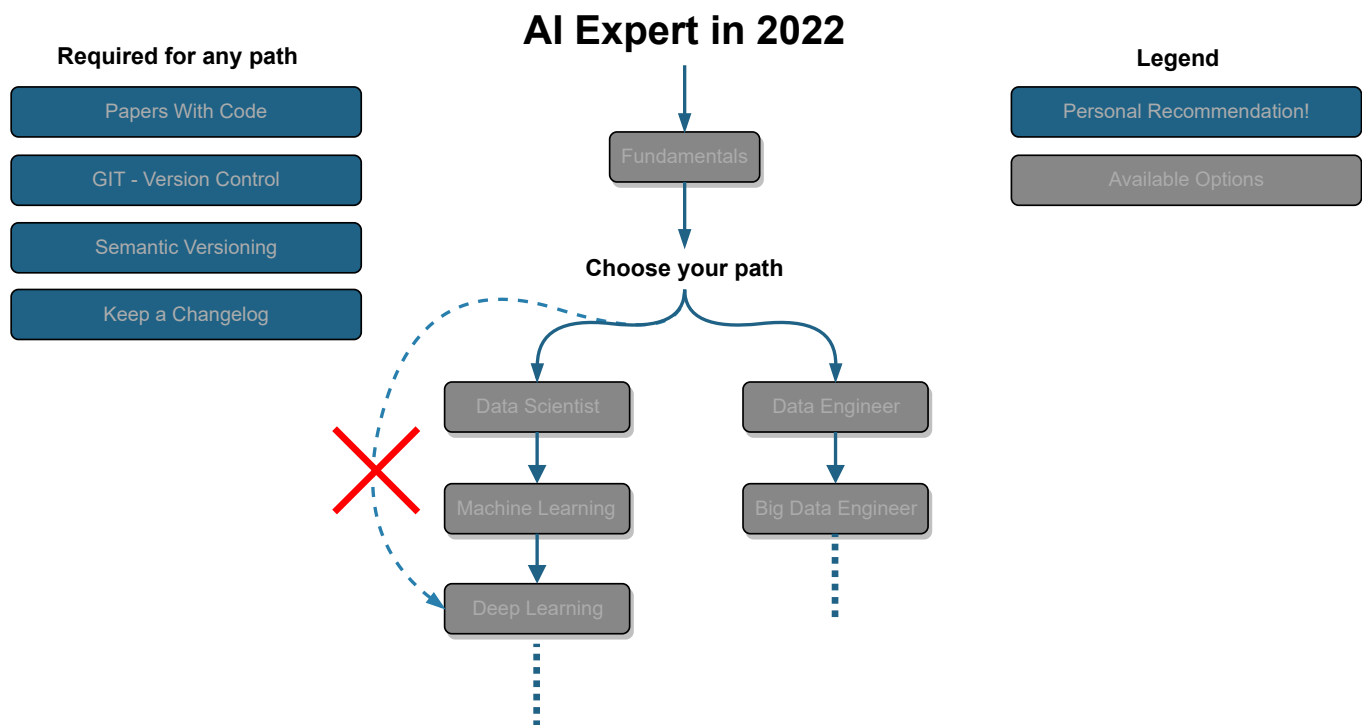
To receive updates **star** ★ and watch 👁 the **GitHub Repo** to get notified, when we add new content to stay on the top of the most recent research.

Follow our **AI Newsletter** to stay up to date with the latest developments in AI. We cover new use cases and research topics.

## Disclaimer

The purpose of these roadmaps is to give you an idea about the landscape and to guide you if you are confused about what to learn next and not to encourage you to pick what is hip and trendy. You should grow some understanding of why one tool would be better suited for some cases than the other and remember hip and trendy never means best suited for the job.

## # Introduction



## Fundamentals

# Fundamentals

## Basics

Matrices & Linear Algebra Fundamentals

Database Basics

Tabular Data

Data Frames & Series

Extract, Transform, Load (ETL)

Reporting vs BI vs Analytics

Data Formats

Regular Expressions (RegEx)

Relational vs. non-relational databases

SQL + Joins (Inner, Outer, Cross, Theta Join)

NoSQL

JSON

XML

CSV

## Python Programming

Expressions

Variables

Data Structures

Functions

Install packages (via pip, conda or similar)

Codestyle, e.g. PEP8

Python Basics

Important libraries

Virtual Environments

Jupyter Notebooks / Lab

Numpy

Pandas

## Data Sources

Data Mining

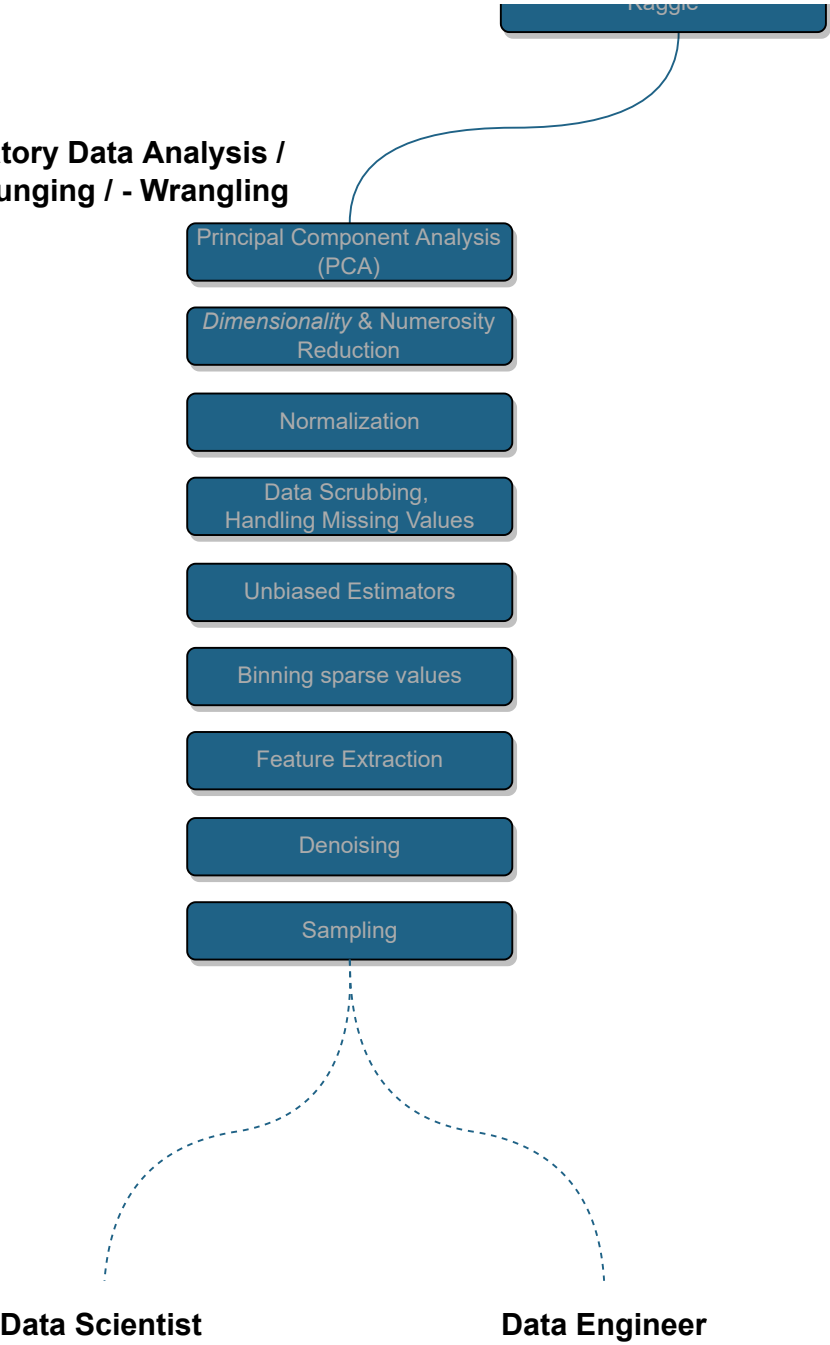
Web Scraping

Awesome Public Datasets

Kaggle

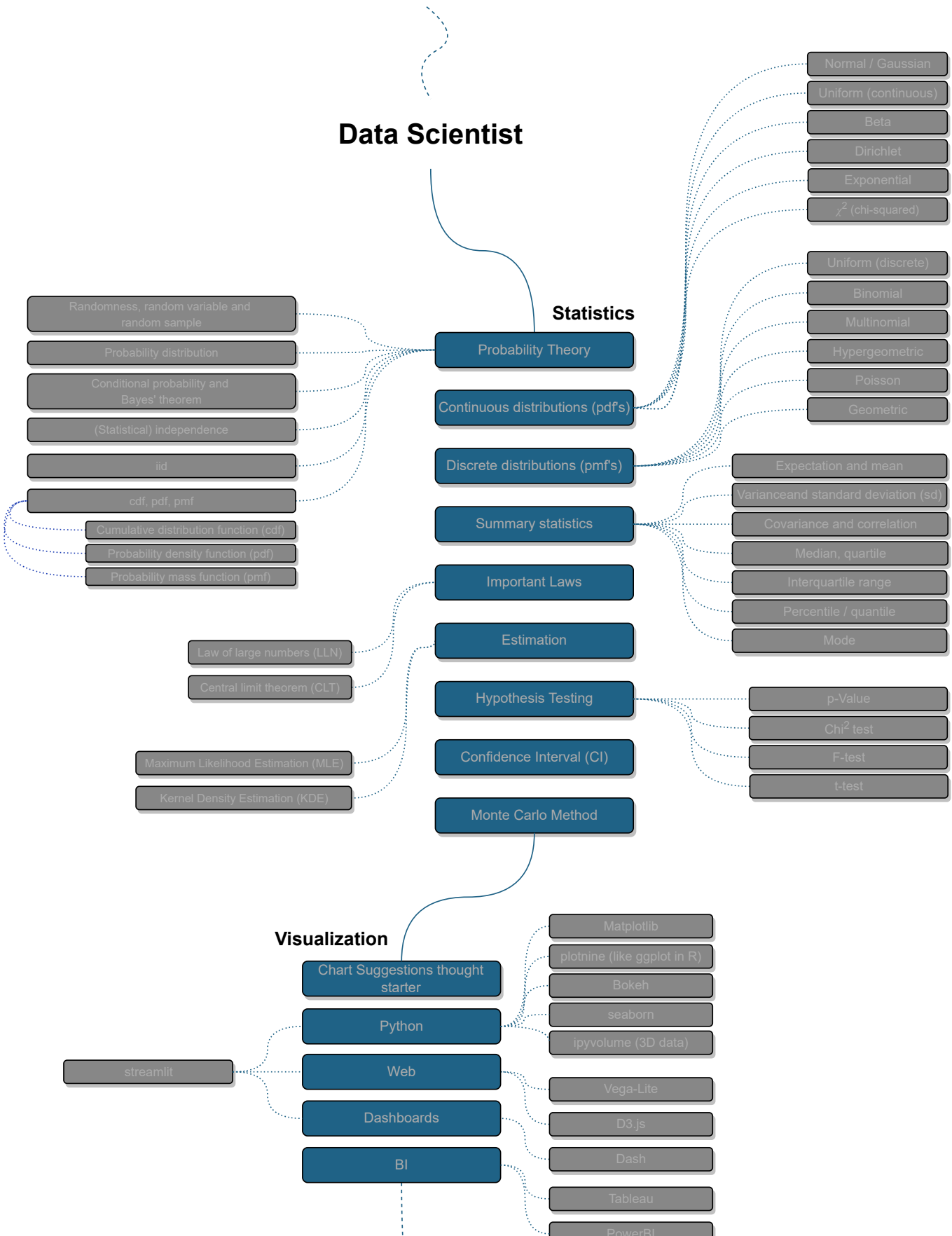
Some boxes link to additional resources  
Interactive version on  
[i.am.ai/roadmap](https://i.am.ai/roadmap)

**Exploratory Data Analysis /  
Data Munging / - Wrangling**



# Data Science Roadmap

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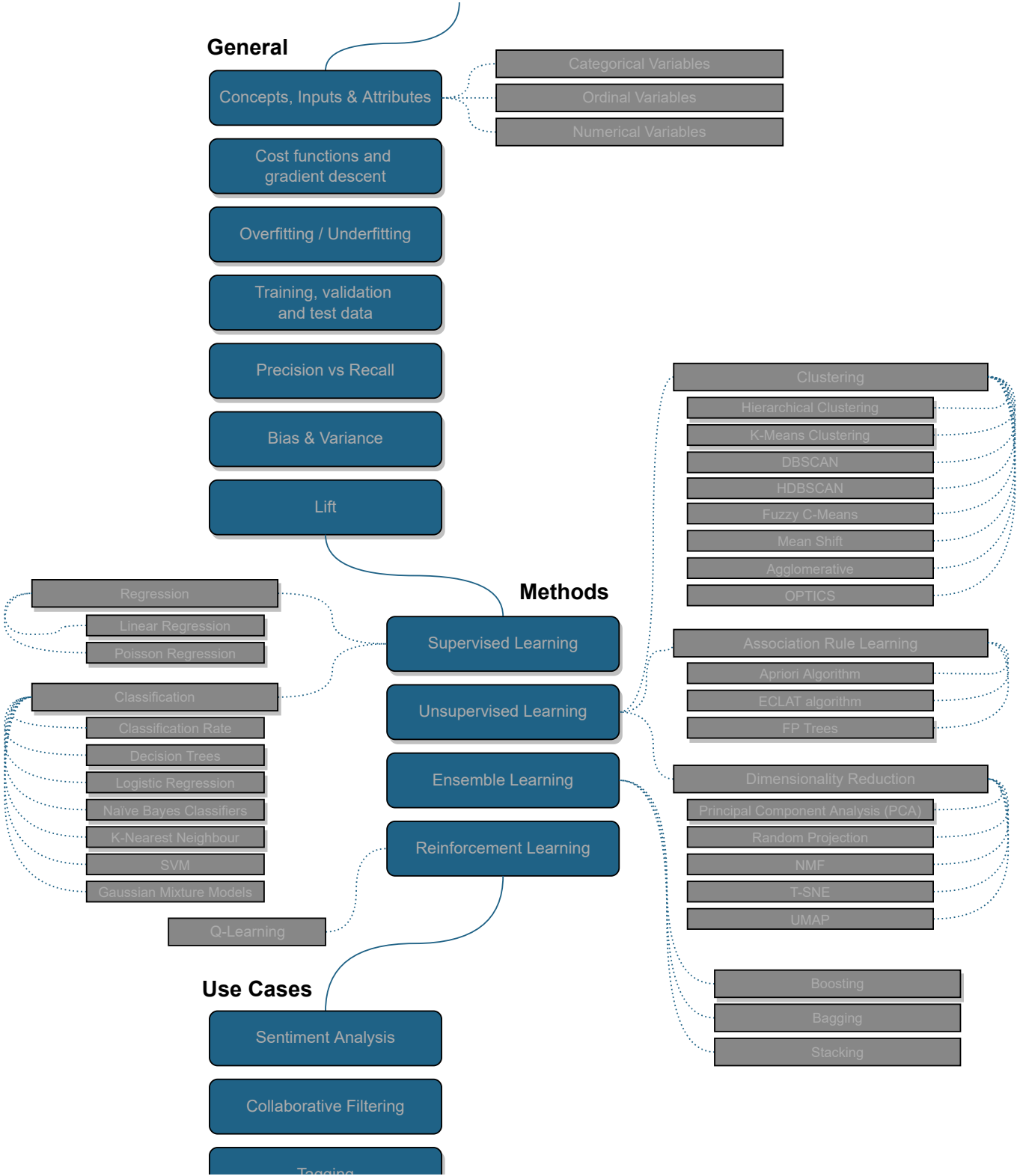


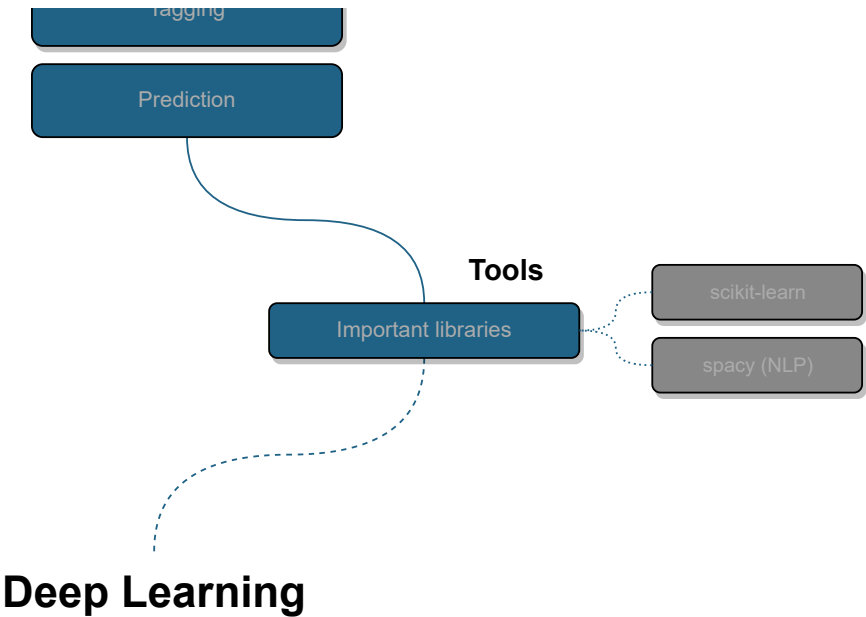
**Machine Learning**

# Machine Learning Roadmap

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# Machine Learning





# Deep Learning Roadmap

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# Deep Learning

## Papers

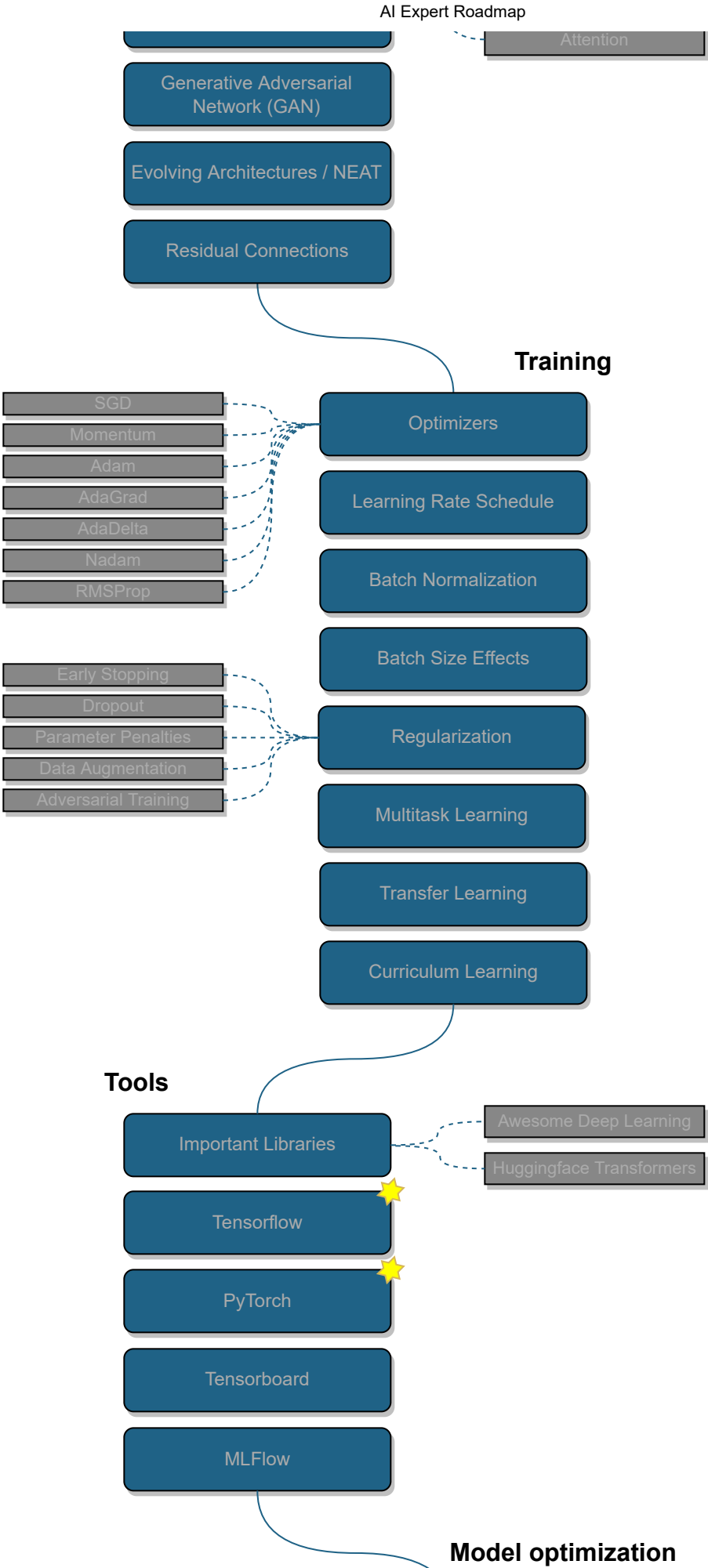
- Deep Learning Papers Reading Roadmap
- Papers with code
- Papers with code - state of the art

## 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
- Siamese Network



**(advanced)**

Distillation

Quantization

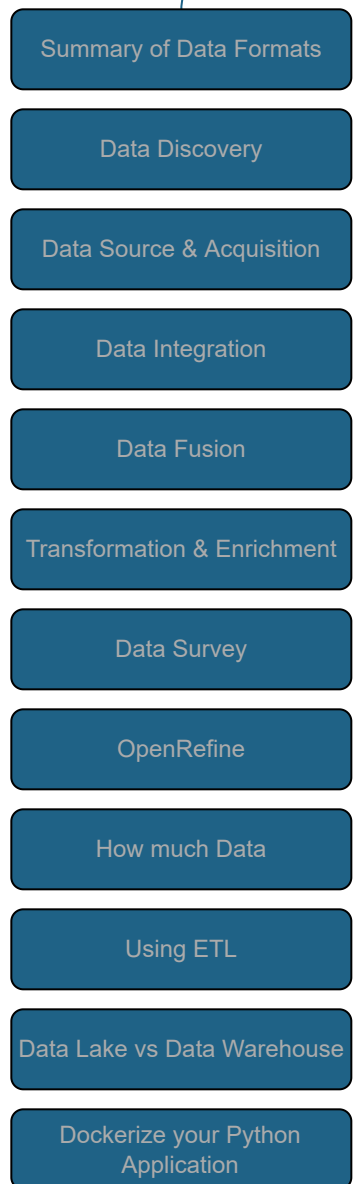
Neural Architecture  
Search (NAS)

**keep exploring and  
stay up-to-date**

## Data Engineer Roadmap

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# Data Engineer



**keep exploring and  
stay up-to-date**

# Big Data Engineer Roadmap

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# Big Data Engineer

## Big Data Architectures

Architectural Patterns & Best Practices (video)

### Principles

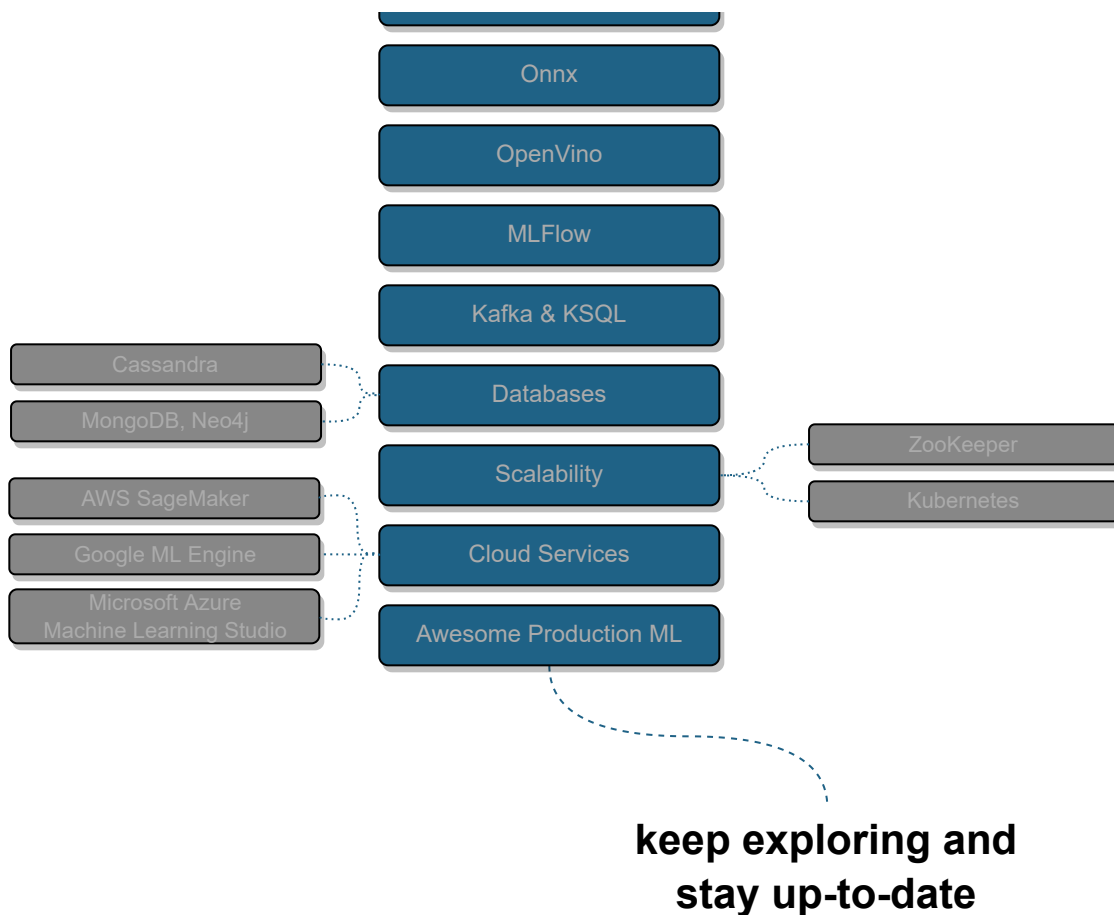
- Horizontal vs vertical scaling
- Map Reduce
- Data Replication
- Name & Data Nodes
- Job & Task Tracker

### Tools

- Check the Awesome Big Data List
- Hadoop (large data)
- Spark (in memory)
- RAPIDS (on GPU)
- Flume, Scribe: For Unstruct Data
- Data Warehouse with Hive
- Elastic (EKL) Stack
- Avro
- Flink
- Dask
- Numba

- HDFS
- Loading data with Sqoop and Pig
- Storm: Hadoop Realtime

to get data (e.g. logging), search, analyze and visualize it in realtime



## Wrap Up

If you think any of the roadmaps can be improved, please do open a PR with any updates and submit any issues. Also, we will continue to improve this, so you might want to watch/star this repository to revisit.

## Contribution

Have a look at the [contribution docs](#) for how to update any of the roadmaps

- Open pull request with improvements
- Discuss ideas in issues
- Spread the word
- Reach out with any feedback

## Supported By

