CloudAEye
Webinar series

How to become a data-driven enterprise with AI

(episode 1)

Introduction: Who are we

CloudAEye

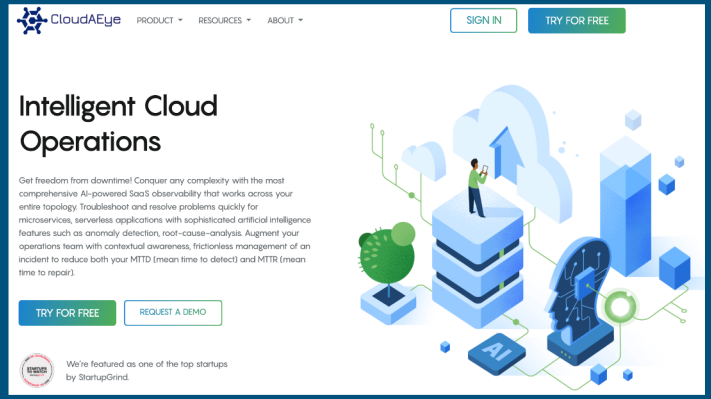
AI-driven observability for cloud-native applications

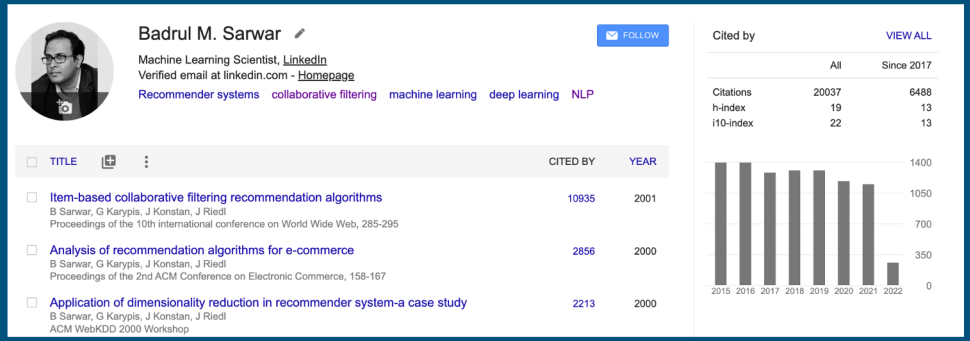
Presenter Bio

Co-Founder and CTO of CloudAEye

AI and recommender systems experience

Led the AI-academy at LinkedIn





Agenda

Organization of the webinar series

- What to expect, topics covered, tools and contents provided

Data-driven Enterprise

- Data-driven organizations and the role of AI

Introduction to AI concepts

- AI/ML/DL/DS
- Introduction to basics of ML: supervised and unsupervised learning
- Supervised and unsupervised learning basics: Regression, classification and Clustering etc.

Code examples

Summary and QA

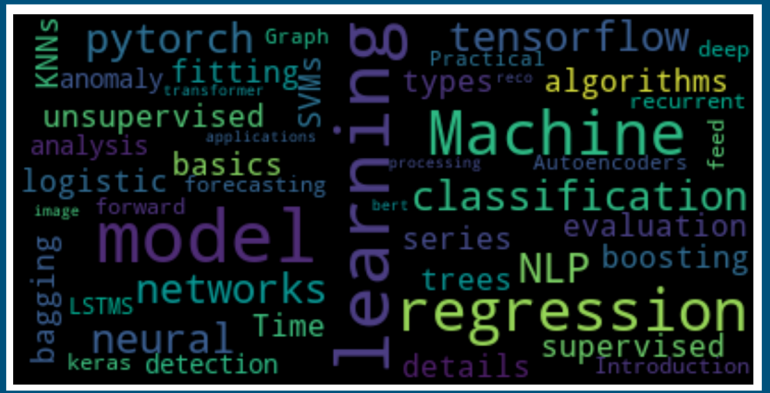
Organization of the Webinar series

Cadence:	Bi-weekly meeting of 30 minutes
Duration:	Approximately 15-20 episodes
Focus:	Basic concepts of AI/ML and how organizations can utilize them
Format:	Interactive, presentation, code examples, Q/A, assignment
Resources:	Github and colaboratory for code, slack-channel for discussion

Webinar series: Tentative Topics

- Introductory concepts
- Machine learning models: types of models, model fitting basics, supervised and unsupervised learning, regression and classification, evaluation
- Classification algorithms details: logistic regression, trees: bagging/boosting, SVMs, KNNs, Bayesian
- Time-series analysis, anomaly detection, forecasting

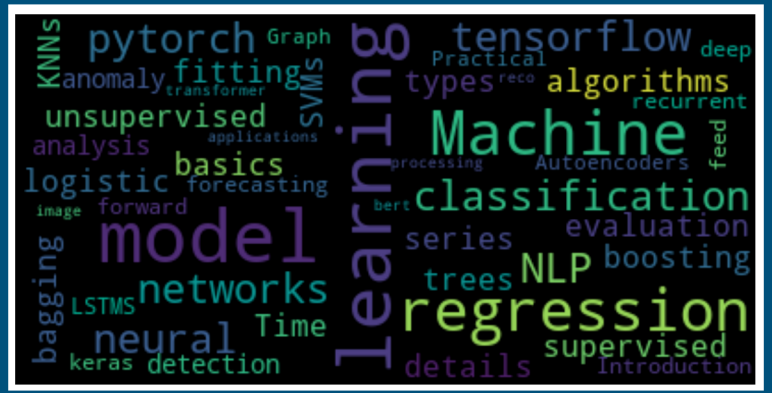
Practical and hands-on
Example code and assignments



Webinar series: Tentative Topics (contd.)

- Introduction to deep learning: feed forward and recurrent neural networks, LSTMS, Autoencoders, Graph neural networks
- Personalization/recommendation: Matrix factorization, wide and deep models, GNN
- Practical applications: image processing, NLP, recommender systems, AIOps
- Transfer learning, self-supervised learning
- Emerging concepts: privacy, fairness, explainability

State-of-the-art models and techniques
Practical large-scale examples



Data-driven Enterprises

Data-driven culture

- We are submerged in data (Big data)
- Data can be leveraged to make better decisions, gauge and improve customer sentiment, streamline operations etc.

What are the traits of a data-driven enterprise?

- Fosters a data-driven culture starting from the top
- Metrics are carefully chosen
- Employees are encouraged to be data-centric and trained on latest tech
- Provides a robust infrastructure for collecting, analyzing and serving

For more info: https://hbr.org/2020/02/10-steps-to-creating-a-data-driven-culture

Data-driven Enterprises: Challenges

Building a Data-driven culture is hard

- Cultural shift is harder than you think
- It’s not about the technology it’s about the people

Barriers of becoming a data-driven enterprise

- Shortage of talent–leadership to worker
- Sheer volume of data and lack of infrastructure
- Lack of clean usable data
- Concerns about privacy

For more info: https://hbr.org/2022/02/why-becoming-a-data-driven-organization-is-so-hard

How to overcome these challenges

There is no short term solution, it takes time

- Think different

  There is no shortage of analytic algorithms. These need to be matched by critical thinking, human judgement, and a view to creative innovation.

- Fail fast, learn faster

  Companies that are prepared for faster iterative learning — fail fast, learn faster — will gain insight and knowledge before their competitors.

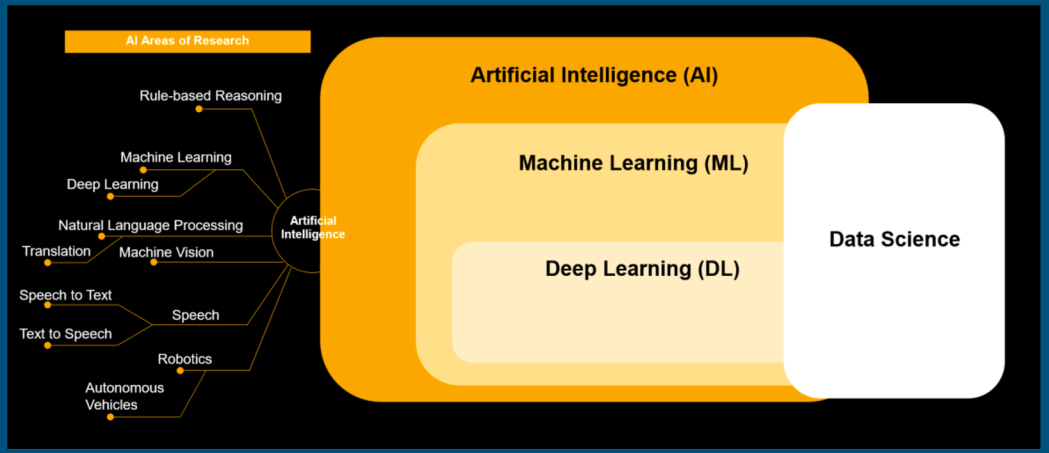
- Focus on the long-term

  Becoming data-driven is a process. It takes time

AI, ML, DL, DS Demystified

AI: Intelligence exhibited by machines. Broadly defined to include any simulation of human intelligence

ML: Subfield of AI that aims to teach computers the ability to do tasks with data, without explicit programming

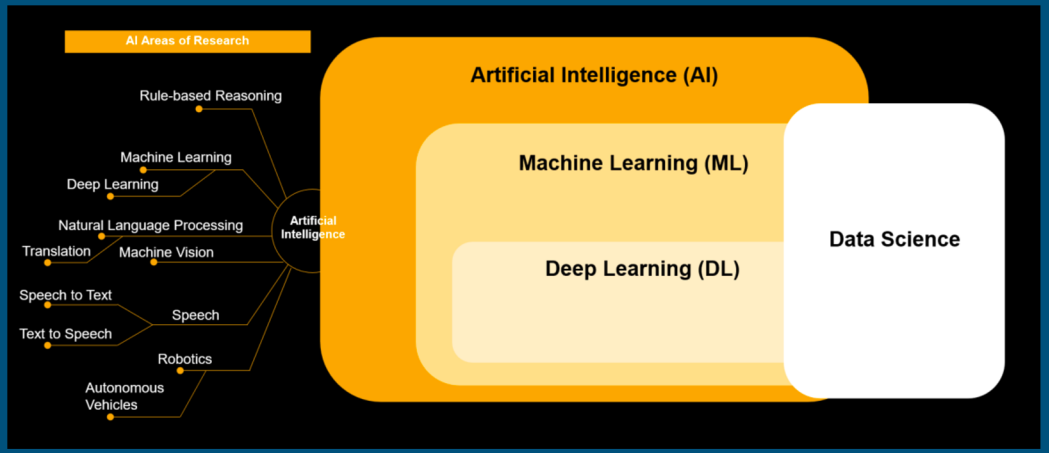


More info: https://medium.com/@marcellvollmer/how-to-make-it-simple-to-explain-ai-ml-dl-and-data-science-a49e54d54a12

AI, ML, DL, DS Demystified

DL: Subfield of ML that uses specialized techniques involving multi-layer (2+) artificial neural networks

DS: Scientific methods, algorithms and systems to extract knowledge or insights from big data

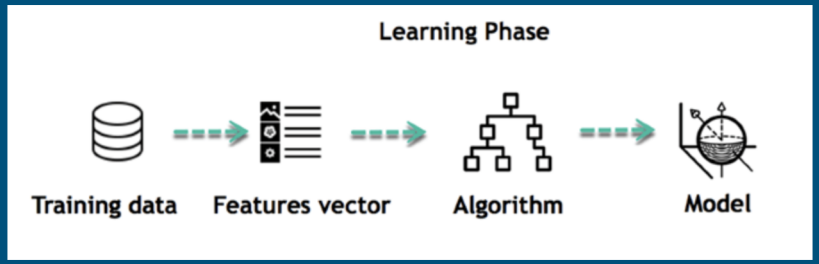


For this webinar series we will focus mostly on ML/DL algorithms

More info: https://medium.com/@marcellvollmer/how-to-make-it-simple-to-explain-ai-ml-dl-and-data-science-a49e54d54a12

Machine learning algorithms

Machine learning algorithms aim to build a model or hypothesis based on the input data



Depending on the type on input ML algorithms can be

Supervised or unsupervised

Supervised ML algorithms

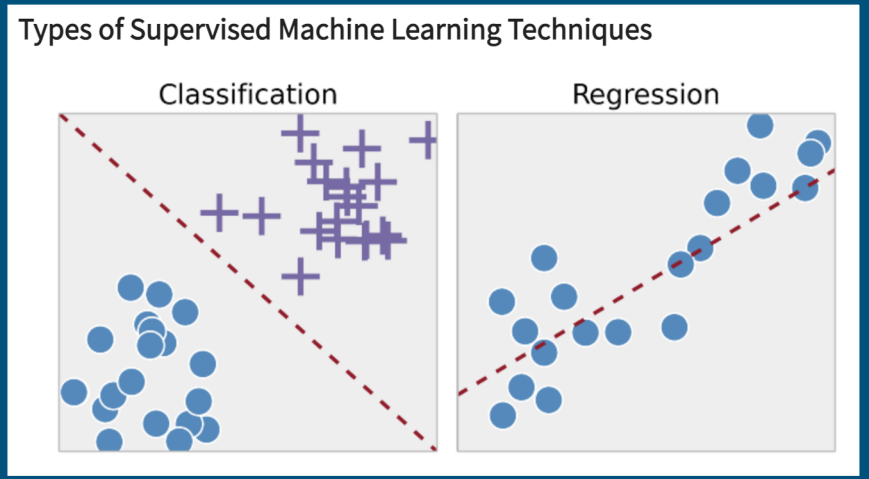
When the data is “labeled” or “tagged” for the correct outcome or value:

Input looks like (X, y)

Where X is the set of input features and y is the outcome variable that is provided

Based on y we have two classes of supervised learning:

1. Regression, where y is continuous ex: linear regression, tree-based regression, SVR
2. Classification, where y is discrete. ex: logistic regression, decision trees, SVM, KNN, deep networks



Unsupervised ML algorithms

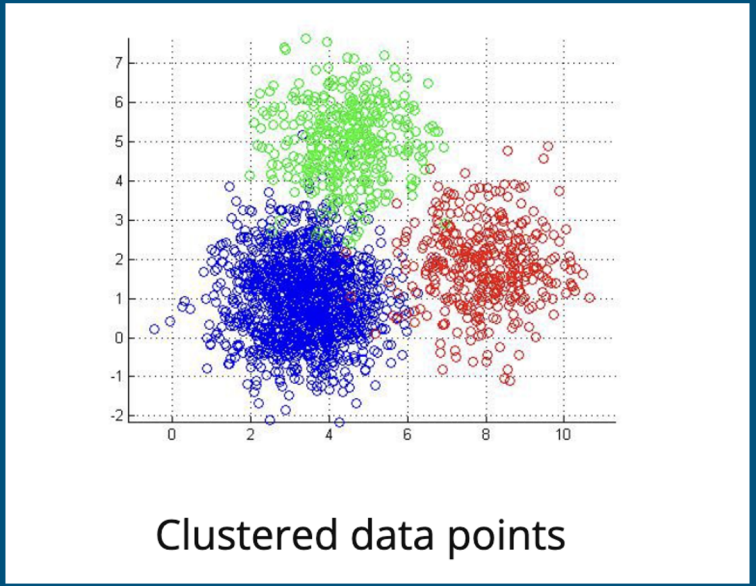
When the data is NOT “labeled” or “tagged”

Input looks like (X)

Where X is the set of input features

Types of unsupervised learning:

- Clustering, density estimation, dimensionality reduction, representation learning, auto-encoders



Clustered data points

Other types of ML

1. Semi-supervised learning

   Some labeled data and mostly unlabeled data are provided, the algorithm uses the labeled data to reason about the unlabeled data

1. Self-supervised learning

   Common-sense learning using lots of unsupervised data e.g., text, images

1. Reinforcement learning

Learning by trials and errors, given a state, a set of actions and reward function these algorithms learn to achieve intelligence through exploration

Coding example

Link to the colab Notebook

https://colab.research.google.com/drive/15xzHZU9G2eiJIyhabFqPFIvAAWki68l1?usp=sharing

Thank You

You have DevOps pain points?

We like to hear from you

Looking for exciting opportunities?

We are hiring

AI/ML engineers and applied scientists

Cloud Engineers

UI/UX designers

CloudAEye