



TECHNOLOGIES

# Data Science – Foundation Class

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# Introductions

- What and Why is Data Science?
  - How it works? - brief Idea
  - Why Learn?
  - Prerequisite to learn this course
  - Prospects
- AI, Machine Learning, Deep Learning, Data Science
  - Data Science, Data Analysis, Statistics, Business Analysis, Data Engineering

# Data Science

- Combines
    - The scientific method
    - Math and statistics
    - Specialized programming
    - Advanced analytics, AI ...
      - Including machine learning and deep learning models
  - To uncover and explain the insights buried in data
  - To draw informed conclusions
- The large and ever-increasing volumes of data
    - Cloud
      - Large Storage
      - Massive Processing Power
      - High-performance
      - Can be accessed from anywhere

# Data Scientists

- Traditional Skills
  - New Skills required
- Also data science practitioners
- Master the full spectrum of the data
- Maximize understanding
- organizing and analyzing massive amounts of data
- Data-driven individuals
- High-level technical skills
- Building complex quantitative algorithms
- Organize and synthesize large amounts of information

# Process (Overall Idea in Brief)

- Data preparation
  - Cleansing
  - Aggregating
  - Manipulating
- Ready for specific types of processing
- Analysis
  - Development and use of algorithms
  - Analytics and AI models
  - Combs through data to find patterns within
- Transform these patterns into predictions
  - Accuracy
    - validated through scientifically designed tests and experiments.
  - Business decision-making
- Results
  - Data visualization tools
  - Possible for anyone to see the patterns and understand trends.
- Tell and illustrate - stories
  - Clearly convey the meaning of results
  - Decision-makers and stakeholders
  - Explain how these results can be used to solve business problems
- Write applications that automate
  - Data processing and
  - All these calculations
- Monitor
  - Ensure that they are working properly
  - Data the model was trained on may no longer be relevant for future predictions

# Use Cases

- Bank
  - Loan - Credit Risk Model, ...
- Media Technology
  - Audience engagement, ...
- Customer Feedback
  - Review - Analysis, ...
- Health Care
  - Alerts, ...
- Optimize the supply chain
  - Predicting when equipment will break down, ...
- Detect fraud
  - Social Networking
  - Finance ...
- Improve Sales
  - Recommendation ...
- Logistics
  - Traffic Pattern
  - Weather Analysis ...
- Self-Driving Car
  - Speed limits
  - Lane changes ...
- Cybersecurity
  - Detect new samples ...