PATTERN RECOGNITION USING PYTHON

Introduction

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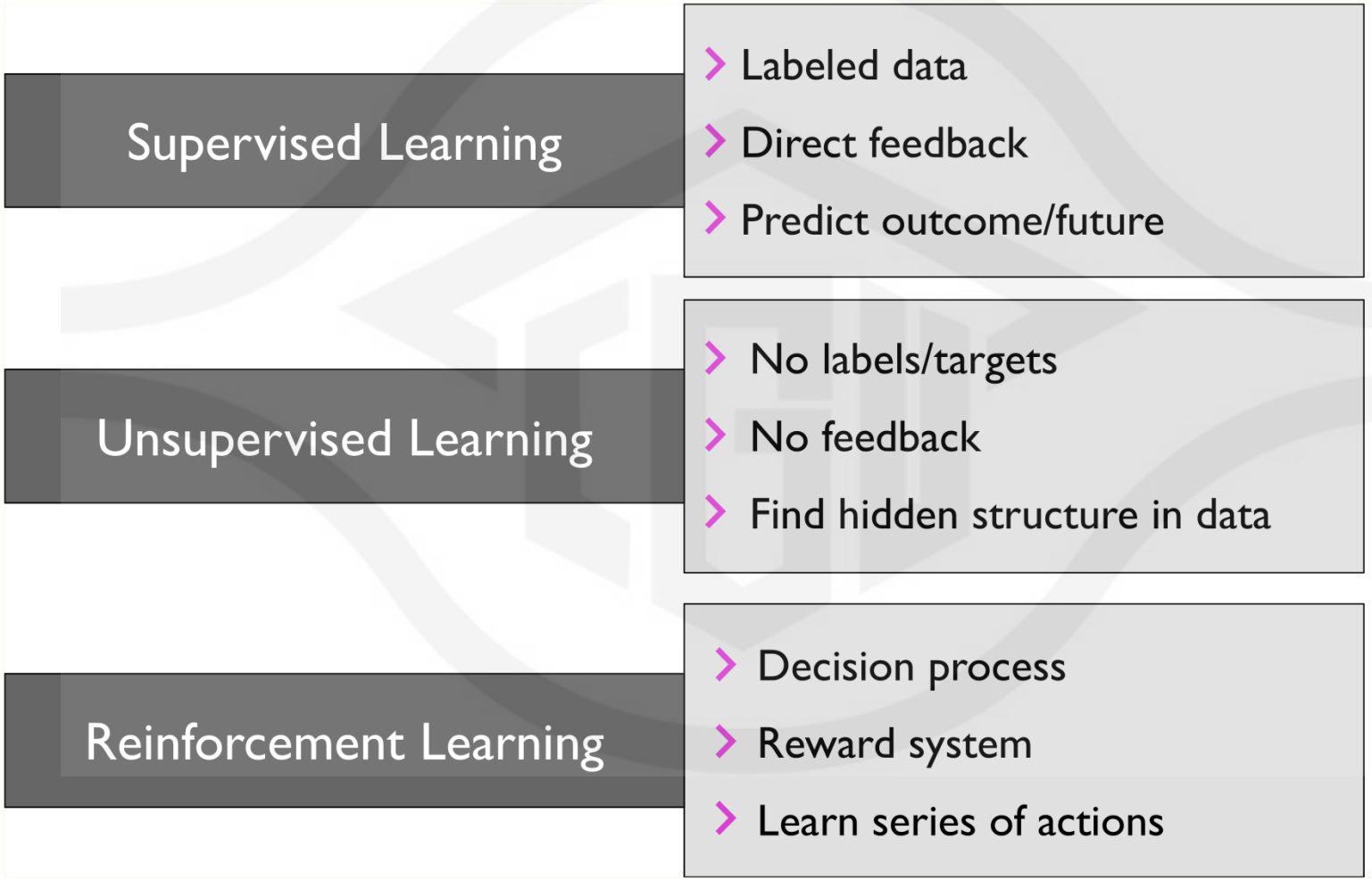
Course Description

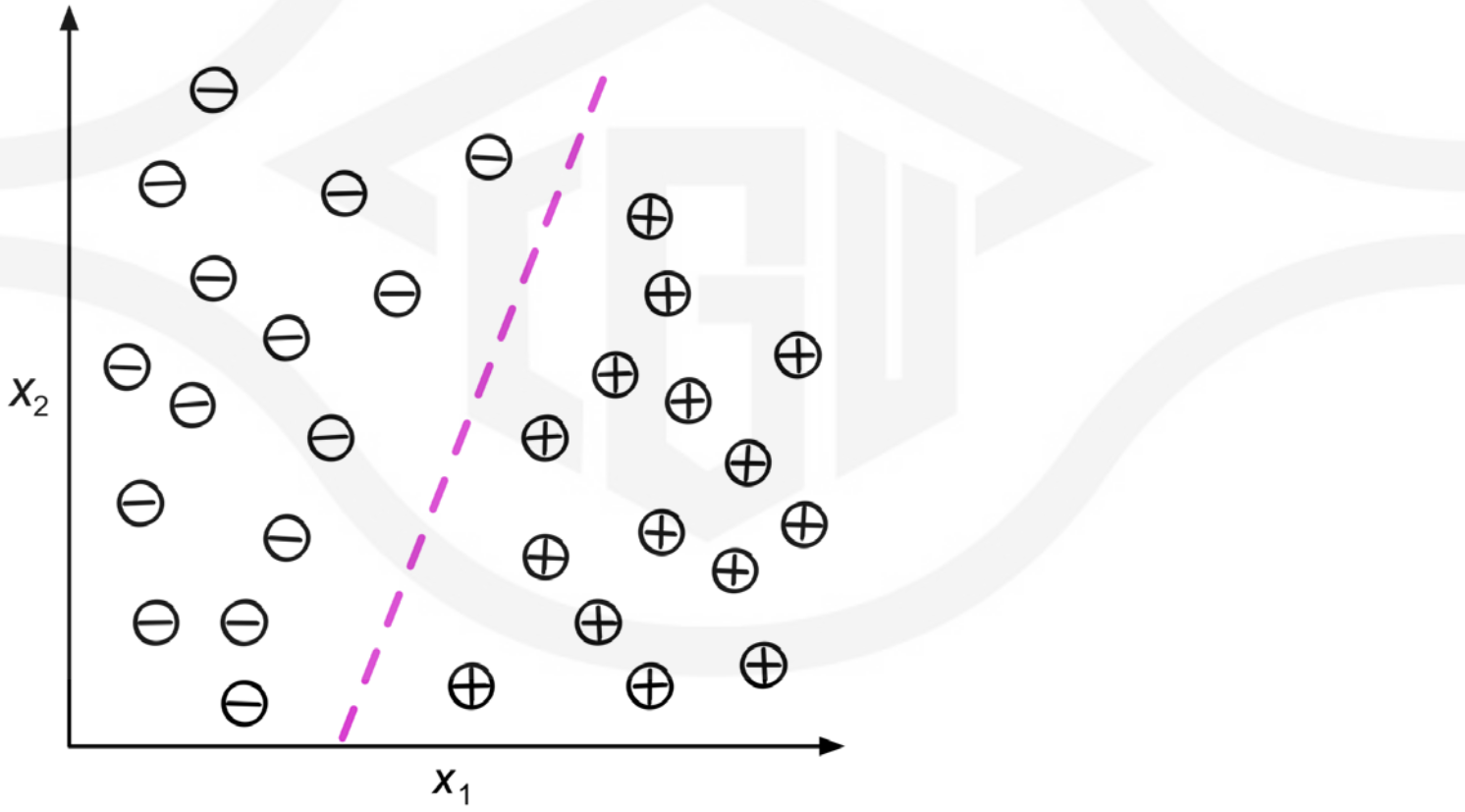
- Python programming
- Machine learning algorithms for classification
- Model evaluation
- Data compression by dimensionality reduction
- Unsupervised clustering analysis
- Multilayer artificial neural network
- Neural network training with PyTorch
- Convolutional neural networks
- Text Data mining
- Recurrent neural networks

Types of Machine Learning Algorithms



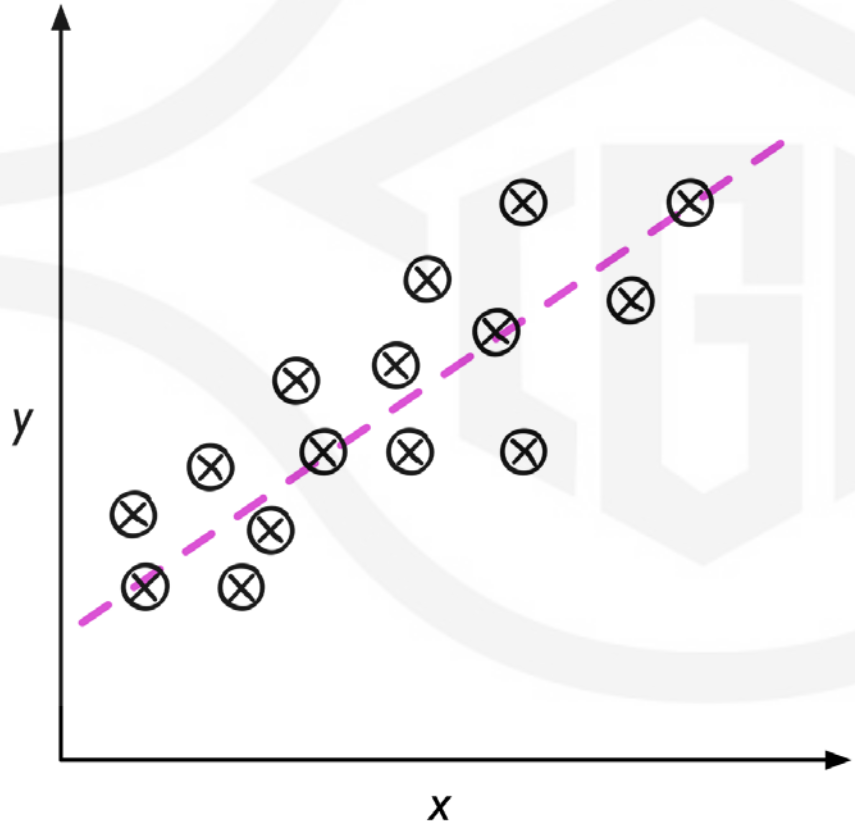
Classification for Predicting Class Labels

- Supervised Learning

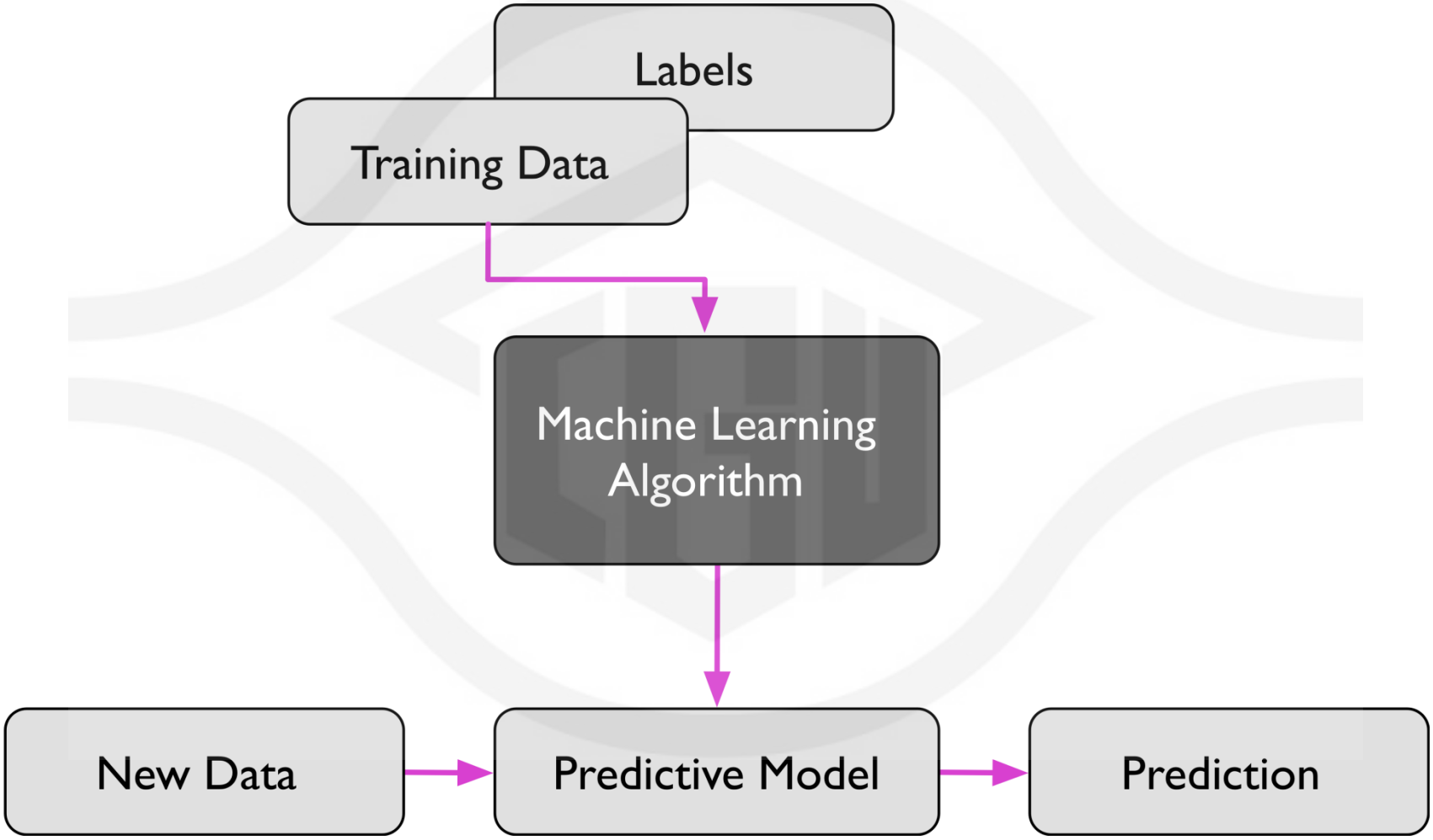


Regression for Predicting Continuous Outcomes

- Supervised Learning

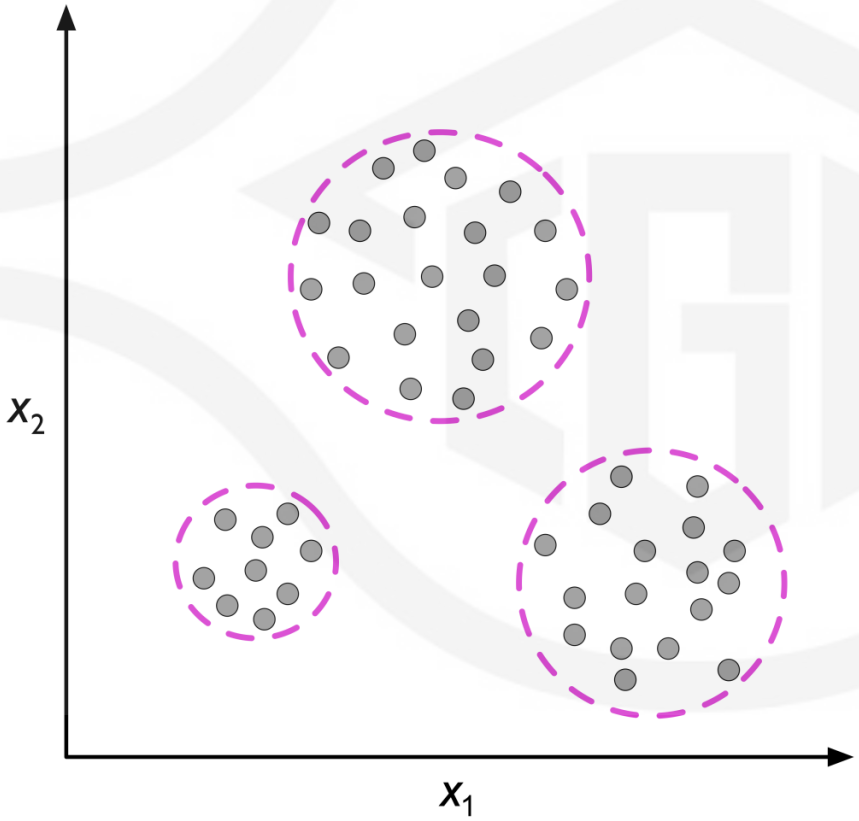


Supervised Learning



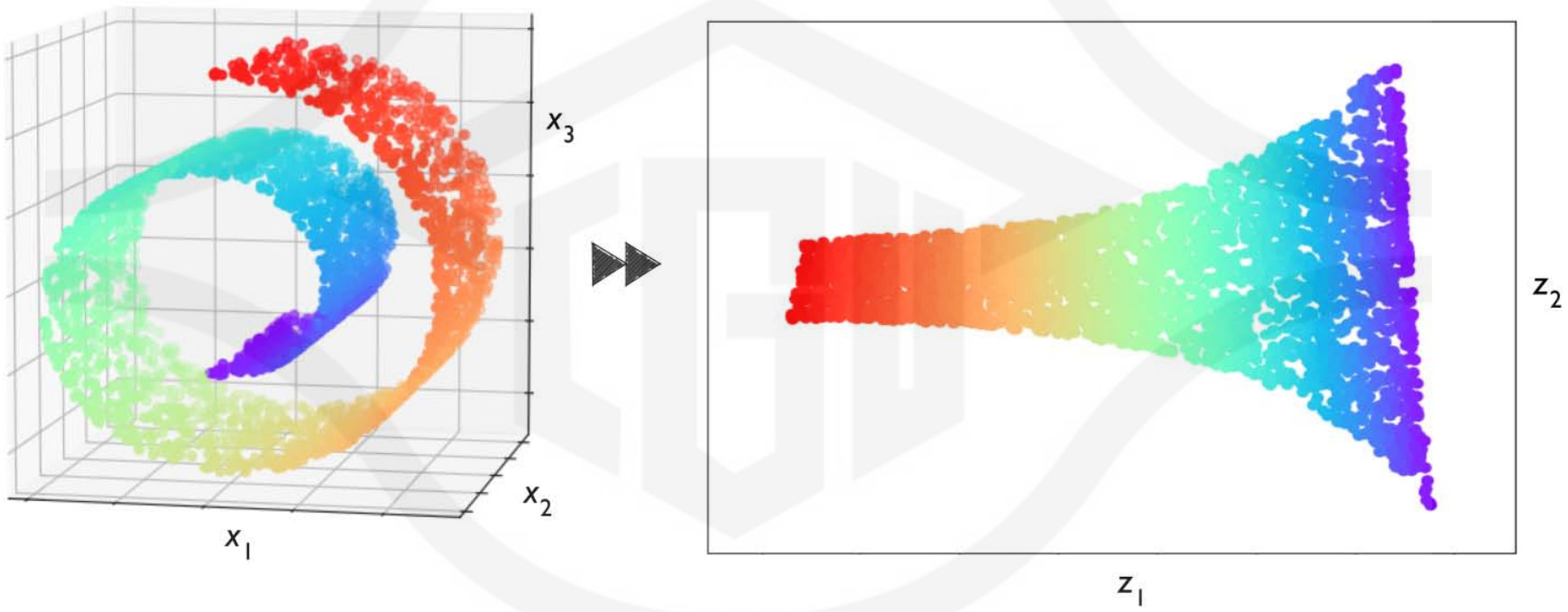
Finding Subgroups with Clustering

- Unsupervised learning



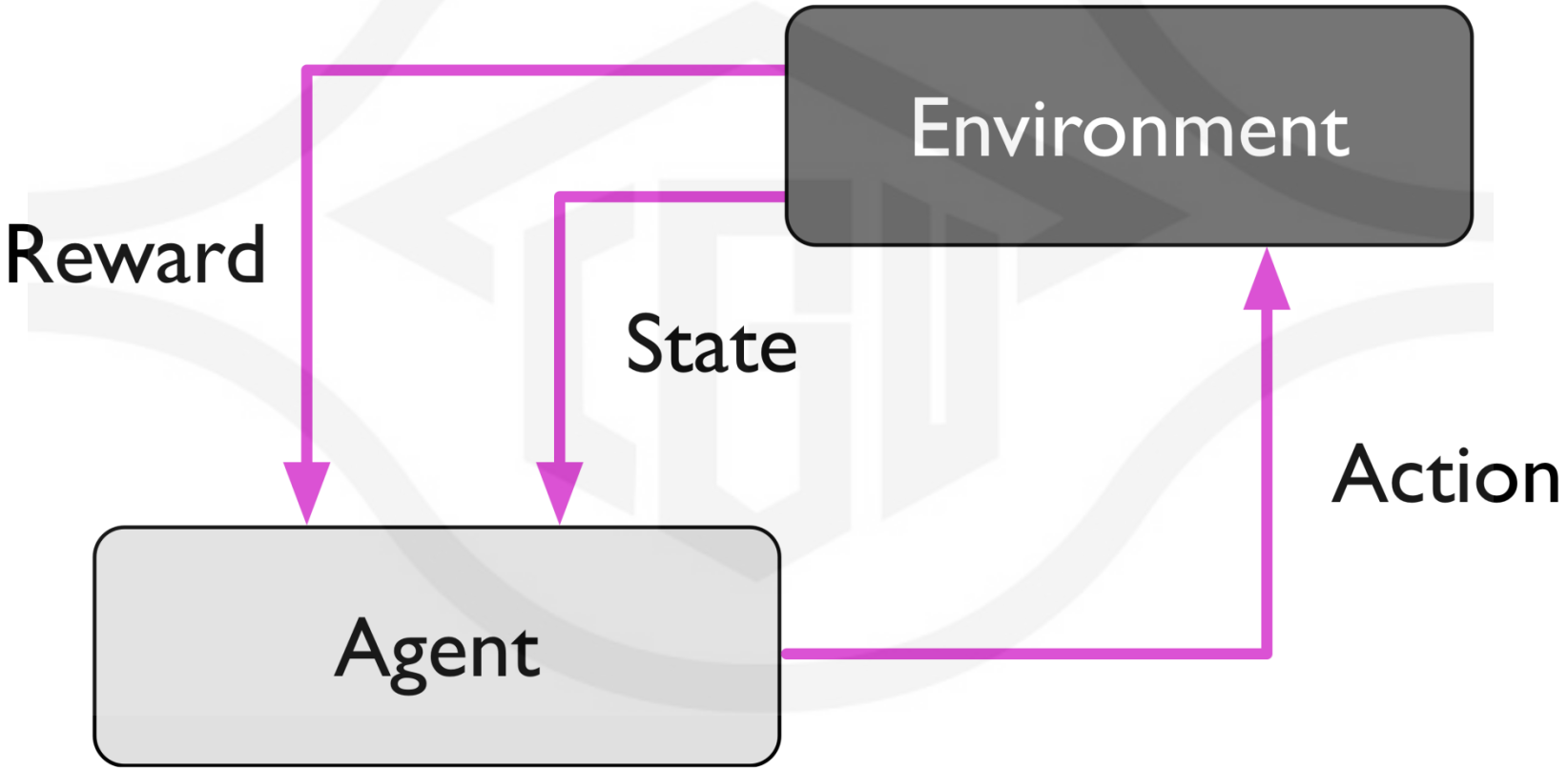
Dimensionality Reduction for Data Compression

- Unsupervised learning

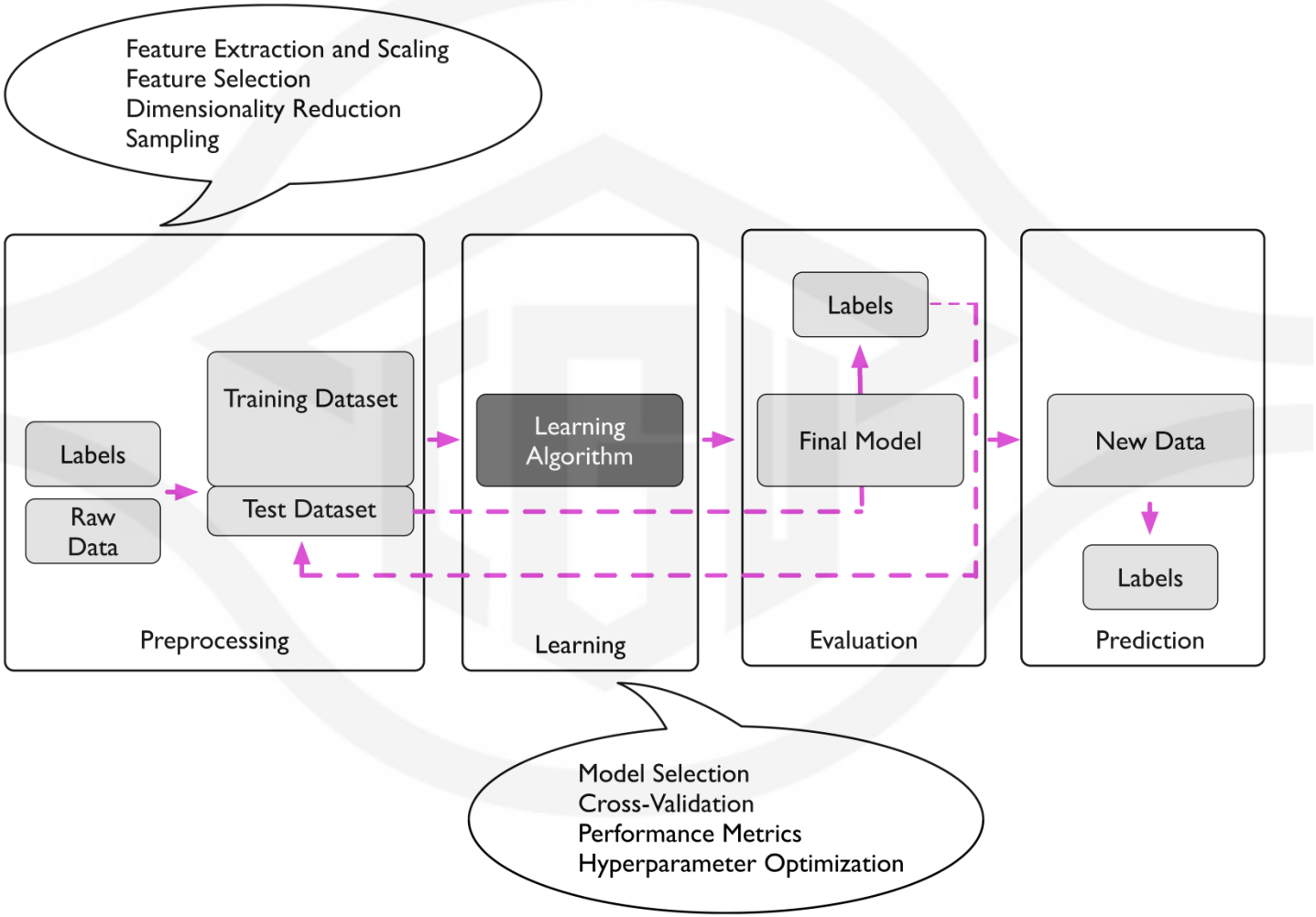


Reinforcement Learning

- Interactive Problems



Roadmap for Building ML Systems



Pattern Recognition Using Python

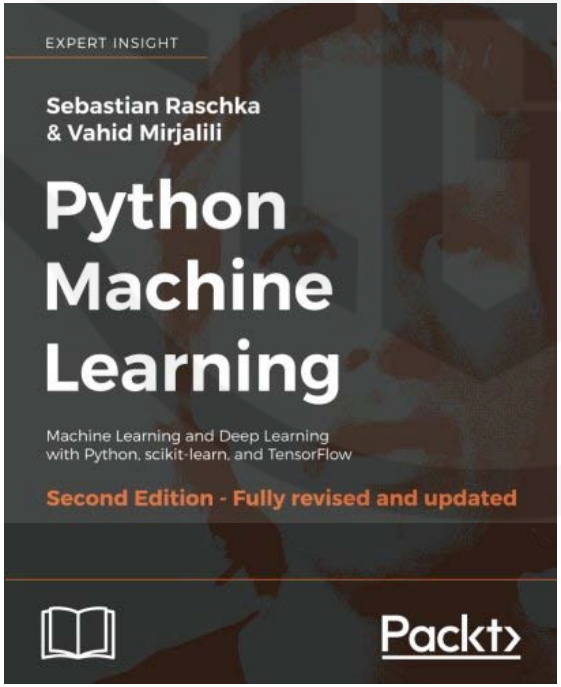
- The Anaconda Python distribution and package manager http://docs.continuum.io/anaconda/navigator/
- Major Python packages
  - **NumPy**: multidimensional arrays to store and manipulate data
  - **SciPy**: mathematics, science, and engineering
  - **Scikit-learn**: data mining and data analysis built on NumPy, SciPy, and Matplotlib
  - **Matplotlib**: visualize quantitative data
  - **Pandas**: higher-level data manipulation built on top of NumPy

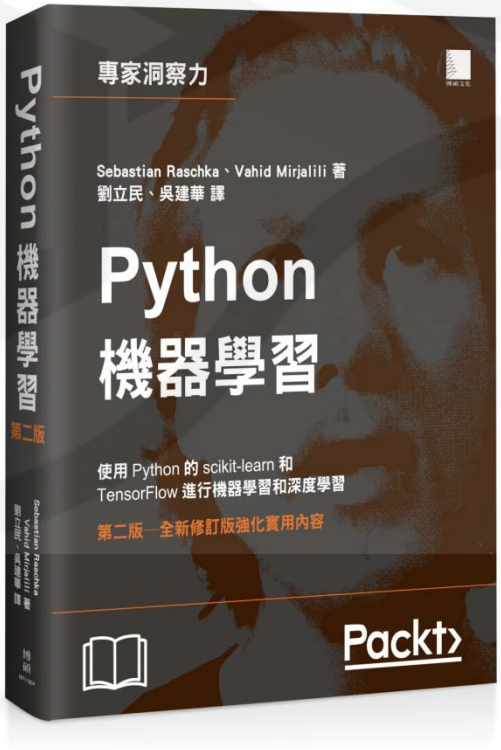
Grading policy

- Examinations
- Class works (attendance, efforts)
- Reports

Textbook

- Sebastian Raschka, Vahid Mirjalili. Python Machine Learning: Machine Learning and Deep Learning with Python, scikit-learn, and TensorFlow. Second Edition. Packt Publishing, 2017.





Reference book

- Vishnu Subramanian. Deep Learning with PyTorch: A practical approach to building neural network models using PyTorch. Packt Publishing, 2018.