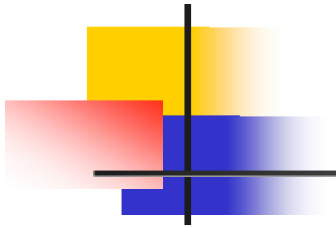


CSE 543

Information Assurance and Security

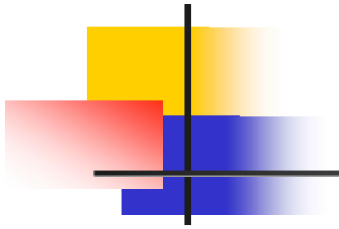
Machine Learning in IA Applications

Professor Stephen S. Yau

Fall 2022

Areas Enabling AI Applications

- Computing paradigms and systems
  - Architecture, hardware, software, ...
- Algorithms
- Smart and big data
- Internet and mobile networks
- Sensing devices
- Semiconductor technologies
- …



IEEE World Congress On Services

September 5-11, 2021 (virtual).

https://conferences.computer.org/services/2021/

July 11-15, 2022 (hybrid) Barcelona, Spain

https://conferences.computer.org/services/2022/

Major Applications of Machine Learning

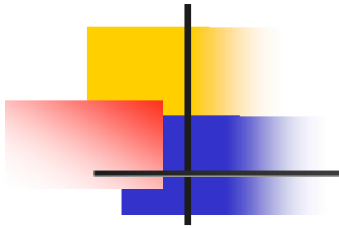
- **Cybersecurity**
- **Speech recognition**
- **Customer service**
- **Pattern recognition**
- **Finances**
- **Healthcare**
- **Transportation**
- **Smart city**
- **…**

Applications of Machine Learning Algorithms to Cybersecurity

- Cloud Systems
- IoT Networks
- Social Networks
- Smart Cities
- Cyber Threat Identification
- Attacks Prediction
- Trusted Coordination of Collaborative Services for Effective Space-Air-Ground-Water Computing and Communications
- …

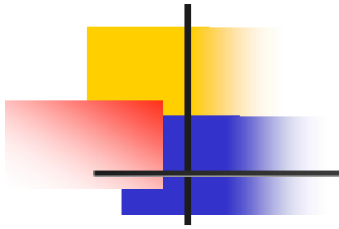
What Is Machine Learning?

Machine learning focuses on the use of ***relevant data and powerful algorithms*** to imitate ***humans*** to learn and improve the accuracy of the ***recognition process*** of applications.



Machine Learning Methods

- Supervised
- Unsupervised (clustering)
- Reinforcement
- Data mining
- Deep Learning
- Statistical machine learning
- …



Neural Networks

- Neural Network is inspired by and resembles the human nervous system and the structure of the human brain.
- It consists of processing units (nodes) organized in input and output layers. The nodes in each layer are connected to nodes in adjacent layers.

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