Machine Learning

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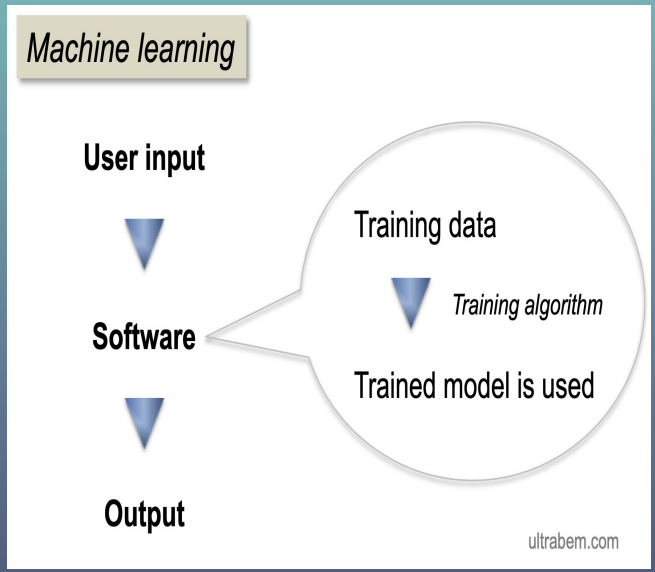
Operation

- Branch of Artificial Intelligence
- Uses data, statistical methods, and algorithms as input
- Implements training model datasets to train the Machine Learning algorithm
- Makes a decision or classification within an application
- Imitates the way humans learn to increase accuracy
- Designed and created through frameworks, like Python
- Can be created with platforms such as TensorFlow or PyTorch



Hardware and Software

- Software based on an Artificial Intelligence platform
  - OpenAI, IBM, TensorFlow, PyTorch
- Strong computer to train models quicker
  - CPU, RAM, Storage (SSDs)
- Specialized Accelerators
  - Tensor Processing Units (TPUs)
  - Graphics Processing Units (GPUs)
- Cloud Services
  - Microsoft Azure, AWS, Google Cloud
  - Reduces computing needs for larger ML tasks

Companies using Machine Learning

Netflix

-Recommendation of shows

- Bandwidth Prediction

Tesla

-Self-Driving Cars

-Realtime Map Generation (traffic, speed, hazards)

Facebook

-Content Moderation

-Ad Targeting

Apple

-Facial Recognition

-Siri Voice Assistant

Internal Business Values

Cyber Security

Automating SOC teams can offload detecting, investigating, and remediating threats to provide cheaper, 24/7 security monitoring of digital assets.

Accounting

Machine learning can use previous accounting data to classify future anomalous accounts to save time spent by accounting team and improve accuracy of financial statements.

Marketing

Using machine learning models to forecast the likelihood of a person to purchase from a marketing campaign can determine how to market to customers, saving both marketing hours and dollars.

External Business Values

Market Analysis

Predictive analytics can analyze market trends to forecast future demands of products, leading a company to produce more product to meet demand, or decrease production of a product to prevent unsought stock.

Supply Chain

Utilizing machine learning to analyze historical sales and economic trends can predict future demand for products, enabling efficient inventory management and logistics planning to minimize costs and streamline operations.

Brand Sentiment

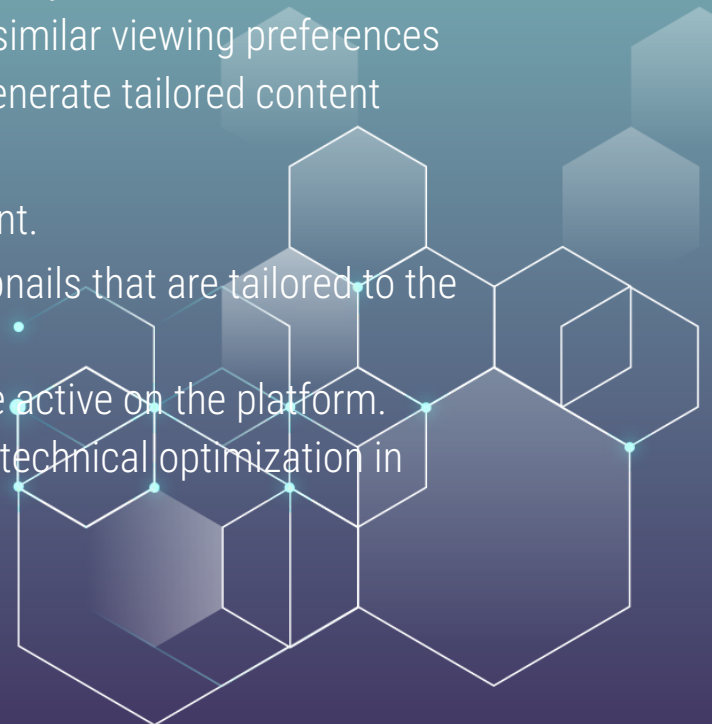
Machine learning can analyze customer reviews and other user-generated content to evaluate public sentiment towards a service. This helps businesses understand customer perceptions to identify areas for improvement.

How Firms Generate Revenue with Machine Learning

- Machine Learning can be used to personalize recommendations and tailor advertisements to customer
- A prime example of this is use is with Netflix.
- Netflix uses machine learning to improve the overall customer experience.
- All kinds of customer data is collected to improve profitability and the customization of the platform.

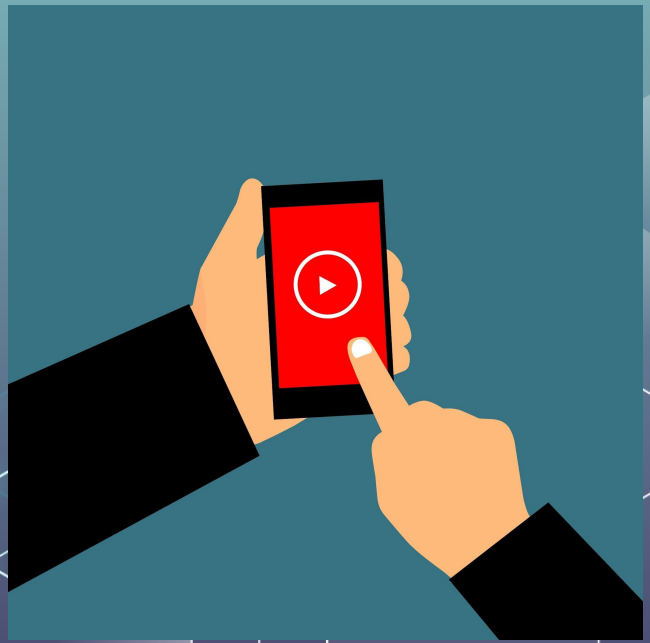
Deeper Dive in how Netflix Uses Machine Learning

- Personalized Recommendations:
  - Netflix collects data about individual viewing history
  - They analyze viewing habits of customers with similar viewing preferences
  - Machine learning algorithms are then used to generate tailored content recommendations
- It goes beyond the recommendations for entertainment.
  - Netflix uses AI to generate entertainment thumbnails that are tailored to the customer.
  - They collect data to predict when customers are active on the platform.
  - Netflix even analyzes bandwidth usage data for technical optimization in streaming quality for users.



The Impact of Netflix's Use of Machine Learning

- This extensive data collections is estimated to drive around 80% of the hours that are streamed on Netflix.
- It significantly influences user engagement and content consumption.
- Predicts optimal viewing times based on user data, which in turn maximizes viewer engagement.
- Click-through rates are increased by presenting visually appealing and personalized thumbnails.
- This builds customer loyalty through their personalized recommendations and the enhanced viewing experience.
- Their leveraging of machine learning sets Netflix apart from competitors with their unique and superior user experience.



How this technology has survived and will thrive

- Many different applications
  - Algorithms, system optimization, predictive analysis,
- Used by the largest and most successful organizations in the world
- Constant innovation of technology
- Data availability and accessibility
  - More data available to organizations than ever before

Effect on the business world

- Disruptive technology
  - Machine learning changed the way organizations operate their businesses
- Automation
  - Chatbots, data analytics, and predictive applications
- Increased efficiency
  - Faster data processing and entry
- Improved decision making
  - Easier ways to analyze data to make more informed decisions

The Future:

- Artificial Intelligence
  - The growth of AI will lead to faster decision making and data interpretation.
  - Provide information to much broader audience.
  - Analyze historical data to predict trends throughout the economy.
  - Larger quantity of AI = More accessible data for analyzation.
- Healthcare
  - Algorithms' analyzation of medical data will lead to early diagnosis of diseases.
  - Better treatment and personalized medical plans.
  - New drug discovery and development.
  - Epidemic prevention

Personal Experience

- Customer Experience
  - Better service
    - Improvement on virtual assistants, inventory management, and pricing strategies.
  - Better personalization
    - Algorithms will understand consumer preferences, behaviors and purchase history.
  - Better protection
    - ML will provide more efficient fraud detection systems and authentication processes.
- Autonomous Driving
  - Improvement of ML will enable self driving.
    - Advanced ML models will process data real time with sensors and cameras.
  - Enhanced Safety Features
    - Reduce crash rates as advanced ML processes driving risks.
  - Better Experience
    - Advanced ML will lead to cars understanding of driver's preferences.

Questions?