

AI Applications – NLP, Computer Vision, IoT

UCS 655

Unit 1: Introduction to Artificial Intelligence

Use cases of Machine Learning

Machine Learning in Sales and Marketing

- How AI supports sale
 - Automate repetitive tasks
 - Prioritize more effectively
 - Provide detailed analytics

1. Forecast Sales

- Demand Forecasting
 - Gartner's survey – demand forecasting is most widely used machine learning application
- What is demand forecasting?
 - Field of predictive analytics
 - Forecast of customer demand
 - Analyzing historical data
- Benefits of demand forecasting
 - Improved accuracy by time
 - Increased customer satisfaction
 - Improved discount optimization
 - Improved manpower planning

Cont.

- AI in demand forecasting
- Mckinscy Digital
 - AI-powered forecasting reduced errors by 30-50% in supply chain networks
 - Improved accuracy leads to reduction in 65% lost sales due to inventory out-of-stock situations
 - Warehouse cost reduced around 10-40%
 - Estimated impact of AI on supply chain is between \$1.2T to \$2T
- Traditional forecasting – ARIMA become outdated
- ML enables enhanced forecasts based on real-time data
- ML forecasting tools can even work for new products

Modern demand forecasting tools

- amoCRM
- Capsule
- CoLIBRI
- ClosePlan
- FutureMargin
- Smart Demand Planner
- Demand.ai

2. Predictive Sales/Lead Scoring

- Prioritizing customers
- Benefit - Increased sales
- How it works?
 - Sales data
 - Lead quality - lead's location, company and position
 - Dynamic criteria like behavior of lead on company's website, historical buying habits, online behavior on other websites
 - Build learning model
- Top vendors in lead scoring
 - Salesforce
 - Sales Cloud Einstein
 - Einstein Opportunity Insights
 - Insidesales
 - Absoultdata

3. Automate Sales Activities

- Sales data input automation
- Sales representative response suggestions
- Meeting setup automation
- Sales representative chatbot
- In-store sales robots – LoweBot
- AI Avatar – Dave.ai

4. Expert Systems

- Software that combines the knowledge of experts in an attempt to solve problems through emulating the knowledge and reasoning procedures of the experts.
- MARKEX
- BRANDFRAME

5. Price Optimization

- Dynamic pricing
- Airlines, e-commerce (Amazon, eBay), car rentals

Machine Learning and Information Security

- Information Security
- Data breaches
 - 2016 – 3.2 million debit cards were targeted in India
 - 2018 – personal data of nearly 50 million Facebook users was compromised
- How ML helps secure data?
 - Finding network threats
 - Protecting cloud data
 - Encrypting data
 - Evading hacker attacks
 - Facilitating endpoint security

1. Using ML to detect malicious activity and stop attacks

- Darktrace
- Wannacry ransomware crisis in 2017

2. Using ML to analyze mobile endpoints

- Google
- MobileIron and Zimperium
- LookOut
- Skycure
- Wandera
 - MI:RIAM – SLocker ransomware

3. Using ML to enhance human analysis

- Assist human security analysts
- CSAIL and PatternEx – AI²
- AI²
 - Detect 85% attacks with five-fold decrease in false positive
 - Clustering data into meaningful patterns – unsupervised learning
 - Fuses three unsupervised learning methods
 - Shows top events to analysts
 - Build supervised model

4. Using ML to automate repetitive security tasks

- SOAR – Security Orchestration and Automation Response

5. Using ML to close zero-day vulnerabilities

- Zero-day vulnerability
- Zero-day exploit
- Zero-day event
 - Vulnerability phase
 - Exploit phase
 - Attack phase
- Bayesian and Markov model
- Convolutional and recurrent neural networks
- Generative Adversarial Networks (GANs)
- Modern deep learning and reinforcement learning
- Deep Q Networks