Basics of Machine Learning for Analysts

Exercise: 1.1 - The History and Tools of Machine Learning

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Title: How Companies Are Using Machine Learning

Problem Definition

The author came up with an idea which defines AI as traditional computers that are extremely fast at performing calculations and data analysis but lack the intelligence required to independently make decisions or predictions, especially when data is incomplete. Artificial Intelligence (AI) and Machine Learning (ML) aim to bridge this gap by equipping computers with the ability to learn from historical data and make informed predictions about future outcomes.

Background

Artificial Intelligence has evolved from rule-based systems to sophisticated algorithms that can recognize patterns in vast datasets. Machine Learning, a subset of AI, focuses on training computer systems to learn from data without being explicitly programmed for each specific task. AI and ML have gained significant traction across industries because they address the limitations of traditional computing.

General Hypothesis

AI and ML can transform industries by enabling computers to handle tasks previously thought to require human intelligence.

Proposed Solutions

1. AI and ML can process and analyze large datasets, enabling companies to make data-driven decisions. For example, Coca-Cola uses AI to analyze consumer preferences.

2. AI can be used to predict patient admission rates and adjust staffing levels accordingly, as demonstrated by hospitals in Paris. This leads to reduced wait times, better allocation of resources, and improved patient care.

3. The collaboration between Google and Rolls-Royce to create autonomous ships illustrates the potential of AI to revolutionize transportation.

4. AI systems, such as AVATAR, can enhance security screening by analyzing facial expressions, voice tones, and body language to detect suspicious behaviour.

5. Companies often face the challenge of information overload due to the rapid growth of data. AI and ML can filter through this data to find valuable insights, enabling businesses to make informed decisions and act on opportunities more quickly.

Structured Approach to AI and ML Implementation

1. Identify relevant data sources and clean the data to ensure quality.

2. Train the model using historical data to identify patterns and relationships.

3. Deploy the model within the intended application, such as customer recommendations, autonomous driving, or fraud detection.

4. Apply transfer learning to use pre-trained models as a starting point for new tasks, significantly reducing the time and resources required for training.