

Data Science & Analytics Webinar

7th November 2020

AI Applications

Yashica Nagpaul

Head of Data & Analytics – Middle East & Africa @ Cigna



Contents



- What makes AI Applications possible today?
- AI Applications & human cognitive functions
- Challenges for AI Adoption
- Use Cases:
 - Banking: Credit Card Fraud Detection
 - Healthcare: Medical Image Detection
 - Precision Agriculture

Disclaimer: All views expressed are personal and should not be deemed to represent the views of either my employer or the Institute of Actuaries

What makes AI Applications possible today?

Data Volume

→ Training Models

→ Cheaper Storage

Data Velocity

→ Cheaper Processing (Cloud)

Variety of Data

→ Evolution of what data is

Polling Question

How many photos & videos are shared on Instagram every day¹?

- A. 35 million
- B. 75 million
- C. 95 million
- D. 130 million



¹<https://techjury.net/blog/how-much-data-is-created-every-day/#gref>

Polling Question

How many photos & videos are shared on Instagram every day¹?

- A. 35 million
- B. 75 million
- C. 95 million
- D. 130 million

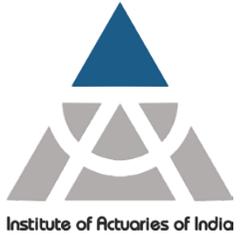


¹<https://techjury.net/blog/how-much-data-is-created-every-day/#gref>

Using output from algorithms, machines can perform functions that imitate humans

- Ability to see
- Ability to communicate
- Ability to keep learning
- Ability to Analyze
- Ability to make decisions

Polling Question



Does google know your age and gender (*even if you never told them*)?:

A. Yes

B. No

Polling Question



Does google know your age and gender (*even if you never told them*)?:

A. True

B. False

Challenges for AI Adoption



- Talent Gap
- Data quality and quantity challenges
- Company culture doesn't recognize the need for AI
- Difficulty in identifying appropriate business cases and how they integrate into existing processes.
- Weak technical infrastructure and tooling
- Legal concerns, risks or compliance issues



Credit Card Fraud Detection

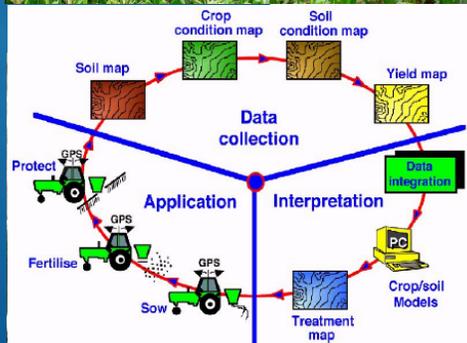
Problem Statement	Global credit card fraud causes losses of ~\$20b to businesses and customers every year
Objective	Detect fraudulent transactions to protect customers and reduce financial loss to the organisation.
Traditional Approach	Rules based checks and investigation by operational teams
Data Required	<ul style="list-style-type: none">• Information on the customer and their 'regular' activity• Historical transaction records which identify transactions that were found to be fraudulent or non-fraudulent.
How is AI Applied	<ul style="list-style-type: none">• These data inputs are used to build models that predict the trustworthiness of the transaction.• Model Structures: Random Forests, Neural Networks• Apply algorithm to analyse transactions in real time
Key Challenges	<ul style="list-style-type: none">• Incorrectly flagging up valid transactions as fraudulent results in poor customer experience• Models for fraud detection need to constantly adapt and update themselves as fraudsters 'get smarter'

Medical Image Detection



Problem Statement	Cancer is a leading cause of death and survival rates for most forms of cancer are far higher when it is diagnosed early.
Objective	Early and more accurate detection of disease to save lives
Traditional Approach	Interpretation of medical images is limited to specific experts owing to its complexity, variety of parameters and knowledge.
Data Required	Medical image records combined with a label for the underlying medication condition and its level of severity.
How is AI Applied	<ul style="list-style-type: none"> • Supervised deep learning models are used to interpret scans, x-rays and other medical data • Similar to other image search algorithms the model looks for shapes that warn that cancers could be in the early stage of development in a patients body.
Key Challenges	<ul style="list-style-type: none"> • Limited availability of medical imagine data • Privacy and legal issues

Precision Agriculture



Problem Statement	The current world population is ~7.5 billion and is expected to grow to over 9 billion by 2050. Feeding all these humans on the planet will require an increase in food production.
Objective	Herbicides and pesticides are used sparingly as possible in the food production supply chain
Traditional Approach	Manual investigation of crops by farmers to identify problem areas
Data	<ul style="list-style-type: none"> • Database of crop photographs
How is AI Applied	<ul style="list-style-type: none"> • Algorithms are used to determine which photographs show crops that are affected by pests and those that were healthy. • After being trained on these datasets, farming machinery was equipped with sensors to allow them to make the same decision • Robotic equipment capable of firing accurate blasts of pesticide chemicals at the crops whilst leaving others untouched.
Key Challenges	<ul style="list-style-type: none"> • The cost of replacing existing equipment can be a significant cost • Accessibility to the internet in remote farming areas