

Contributions of AI to Society

How AI is Shaping our Society



AI and Society

- Artificial intelligence is everywhere, from something as personal to us like smartphones to something distant like corporate decision making
- The versatility of AI enable it to have systemic impact on human society
- AI has already changed how we work, learn and live
- The age of AI is here and we have to embrace it

**Let's explore some notable contributions of AI
to our society!**



Source:

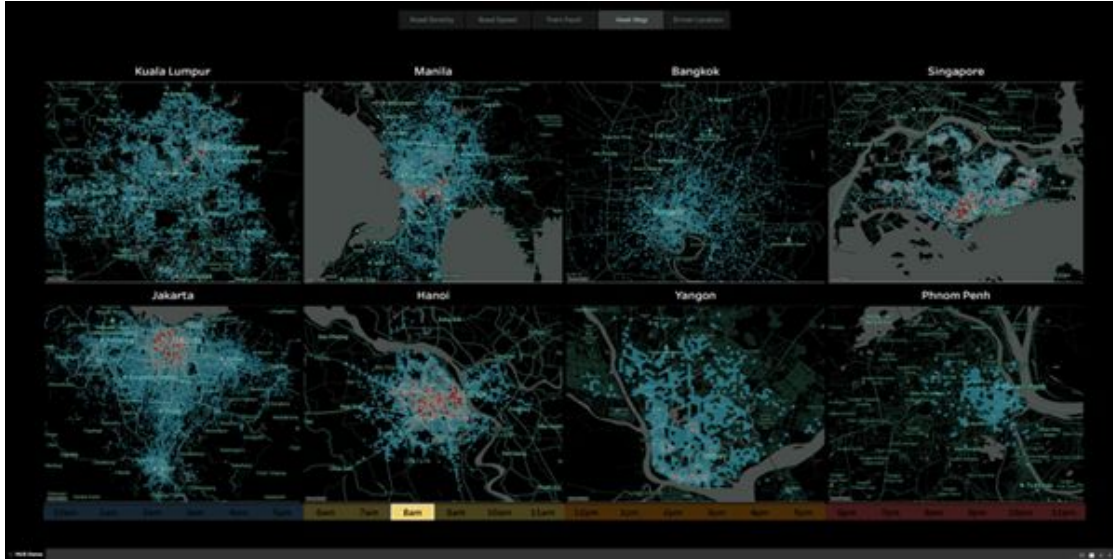
<https://medium.com/swlh/artificial-intelligence-vs-the-human-element-how-will-machines-impact-our-future-8d195ca3776c>

Transportation: Ride-Sharing Services

- **Driver-to-rider matching:** To find the best **match**. Handles millions of transactions at any second
- Fix **traffic congestion** - understand travel **demand** and **patterns**. Forecast travel demand based on **historical** bookings to **predict areas** and **times** with high travel demand
- Build richer **understanding** of the **region's roads** - Discover **undocumented** road segments



Transportation: Traffic Management Data



	A	B	C	D
1	geohash6	day	timestamp	demand
2	qp02yc	14	2:00	0.002867
3	qp02yc	37	6:15	0.058792
4	qp02yc	45	1:00	0.006552
5	qp02yc	39	5:15	0.007625
6	qp02yc	58	2:45	0.011352
7	qp02yc	58	2:30	0.030095
8	qp02yc	48	10:30	0.04679
9	qp02yc	10	22:15	0.004221
10	qp02yc	34	5:30	4.60E-05
11	qp02yc	21	5:45	0.05054
12	qp02yc	16	9:15	0.028873
13	qp02yc	40	6:45	0.023466
14	qp02yc	50	5:15	0.019776
15	qp02yc	46	10:15	0.0127
16	qp02yc	10	23:45	0.000428
17	qp02yc	7	10:15	0.012142
18	qp02yc	30	9:00	0.098089
19	qp02yc	39	2:45	0.220175
20	qp02yc	8	3:45	0.004063
21	qp02yc	50	7:45	0.012545
22	qp02yc	26	6:00	0.000425
23	qp02yc	10	23:00	0.033557
24	qp02yc	35	6:15	0.024515
25	qp02yc	15	5:30	0.016947
26	qp02yc	61	4:45	0.014507

Contributions of AI to Society

How AI is Fighting Against Fraud

Fraud Detection: ORANGE TELCO's SIM box Fraud Detection

- A Subscriber Identity Module Box (SIM box) is a device used to reroute or bypass international traffic channels from one country to a SIM Box device in another country.
- Orange Silicon Valley worked with Skymind to prevent SIM box **fraud** on its mobile network.
- Using an artificial neural network (ANN) called an **autoencoder**, Orange Silicon Valley analyzes call detail records (CDRs) to **find patterns that identify fraud**.
- ANN **predicts the likelihood that an instance is fraudulent**, enabling Orange's analysts to prioritise high probability cases of SIM Box fraud adaptively.
- Succeeded in **reducing at least 50% of the misappropriation losses** in the early stages.



Fraud Detection: Fighting Fraud in Finance

- A 2018 survey conducted by PwC found that current method is generating too many false positives
- AI is powerful when it comes to recognising patterns
- The banking industry is one of the first to capitalise on this capability to fight fraud transactions
- According to Forbes, the financial industry employs AI in the following approaches:
 - Actively use supervised learning to learn about the fraud attack patterns faster than manual approaches
 - Combine supervised and unsupervised learning into a single fraud detection system to excel in finding anomalies in emerging data
 - Capitalise on big data to train and finetune models thus improving prediction performance



Forbes

Source:

<https://www.forbes.com/sites/louiscolumbus/2019/08/01/ai-is-predicting-the-future-of-online-fraud-detection/#7fc9c0db74f5>

Fraud Detection: Visa's Fraud Fighter



Source:
<https://www.youtube.com/watch?v=96k0sncyoXA>

Contributions of AI to Society

How AI is Helping Our Environment

Environmental Science: Using AI to Save the Environment

- With increasing human activity, the environment is taking a larger toll
- Every human activity contributes to an element which is detrimental to the environment:
 - Industrialisation: chemical release which causes acid rain and changes in soil properties
 - Vehicles: release of carbon dioxide which contributes to greenhouse effect
 - Energy generation: current energy generation methods which are reliable is dependant on fossil fuels
- Negative impacts have been done, thus scientists are making effort to reduce or even reverse these effects
- AI is the key enabler to make these effort into reality



Environmental Science: Studying the effect of hurricanes on tree species distribution

- Professor Maria Uriarte from Columbia University investigated how tropical storms affect the tree species distribution in El Yunque National Forest, Puerto Rico
- Flyover photographs are used to determine which tree species was destroyed after the storm
- AI is used to process flyover images and identify various tree species
- Ground information are compared to flyover images to figure out the visual properties of tree canopies
- Determining forest composition is crucial because:
 - When forests are damaged, more carbon dioxide is emitted into the atmosphere
 - When these vegetation grow back, they store less carbon
 - Forests might not be able to recover from more extreme storms



Environmental Science: Making electric grids reliable

- US Department of Energy and Stanford University is using AI to identify the vulnerabilities in the grid, strengthen them in advance of failures and restore power more quickly when failures occur



- The AI model uses various data sources as input: renewable energy sources, battery storage and even satellite imagery to determine where trees is growing over power lines
- The partnership aims to develop an electric grid which can manage renewable energy autonomously without intermittent effects and recover from failures with minimal human involvement

Source:

<https://blogs.ei.columbia.edu/2018/06/05/artificial-intelligence-climate-environment/>

Environmental Science: Storing Renewable Energy



Source: <https://www.youtube.com/watch?v=yAwKVv6TtGM>

Thank You

