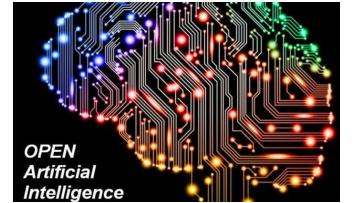


Machine Learning

In Action

OpenAI



- Elon Musk's \$1bn non-profit OpenAI is teaching robots how to imitate humans
 - Robots to complete a specific task after watching a person demonstrating just once.
- OpenAI has developed new algorithm “one-shot imitation learning”
 - Lets researchers communicate a task to an AI first by performing in Virtual reality and teach it to replicate the physical action
- Consists of two stages – vision network to identify objects through computer vision and imitate action
 - Vision network is trained with simulated images with different lighting, textures and objects
 - Imitation system observes demonstrated tasks, infers the intent of action and steps a human would have taken in same situation
- This system could form the backbone of the **general-purpose robotics systems**

Smart Reply



- Suggests answers to incoming emails
 - Learns user's writing style, for example usage of punctuation marks
 - Gives suggestions only where google finds them relevant
 - Smart Reply will learn to understand your writing style to suggest response accordingly
- Uses natural language processing algorithms to analyze emails and generate response
 - Then ranks these to pick three best responses



Kentucky Derby

- The superfecta is a type of betting in which the bettor, in order to win, must pick the first four finishers of a race in the correct sequence
 - \$20 superfecta bet on last year's (2016) race would have returned \$11,000
- Swarm AI, created by unanimous.ai to predict the Superfecta outcome
 - Inspired by birds and animals flocks to amplify their intelligence and decision making as groups
 - Taps into the intelligence of groups and evokes the best possible prediction based on the available information
 - Applicable in the other fields like forecasting movie box-office, predicting the price of bitcoin\
 - Unanimous.ai was able to predict superfecta accurately in 2016, it failed to do so in 2017.

Digital Identity Verification



- ID verification involves matching PII data against non-reported data sources — utility bills, legal records, credit records, social media etc.
- Automated process to extract complex patterns from vast amount of data in real time that is beyond human abilities
 - In automation, the biggest hurdle lies in identifying the reliable data from the corpus of massive amount data – it's a data engineering problem
 - Socure builds a system to automatically understand specific patterns that separate good data vs bad data
- Running such automation in cloud across all customers gives benefits of collective intelligence

Reimagining Bollywood Fashion



- Watson APIs analyzed over 6,00,000 images from high-end couture, which is from 2006-2017, runway images from the top 4 fashion weeks and tens of thousands of images from the 70s to the present generation of movie images, posters of Bollywood
- IBM Watson had been programmed to decode fashion images and the key aspects associated with them
 - Detect the face in the image, the pose of the model as well as body, color, cut and silhouette of an outfit.
 - Detect if two outfits were similar and determine the dominant colors in an image
- This research was humanly impossible, and would have taken 3-4 months with ambiguous results.
 - Watson processes this vast amount of data in mere seconds
- IBM Watson will aid in designing the future of Bollywood fashion by deriving from its illustrious past

AI in Digital Storage



- AI can provide ways to organize unstructured data, videos and sensor measurement which is growing enormously and will lead to 56% annual increase of data every year.
 - Cloud is emerging as a way to provide services such as Storage and AI can make the content available for repurposing.
- Google's ML tool include TensorFlow and its Cloud machine Learning Engine allows speed recognition, image recognition, translation capabilities and various API to use ML data for further action.
 - ML technologies can be used to reflect audience reactions to what is happening in a live event.
- Knowledge worker were wasting up to 50% of their time hunting for data, identifying and correcting errors and seeking confirmatory sources for data.
 - Cognitive services to index, extract and classify data helped discover “dark data”.
- Transcription of a 60 minute video costs \$15 per hour and it takes 4-6 hours for a 60 minute transcription of audio content with 99% accuracy for a human. Google charges \$0.005 per 15 minute and with parallel processing 60 minutes of audio can be transcribed in 5 minutes.
 - The cloud based solution is approaching 99% accuracy.
 - High-quality enterprise search solution can reduce “search time” by 54%, empowering greater use of unstructured data.
- Microsoft's Azure Media services offers encoding and data analytics to support live on-demand streaming from Content Delivery Network.
- Administrator and Data Analysts to deal with fast-growing unstructured data in order to organize and categorize the data, making it available whenever its needed.

Matchmaking



- Amid declining birthrate, municipalities in cities across Japan are boosting matchmaking efforts and people are finding it as more reliable and less costly compared to private operator.
- According to a survey, about 600,000 people participated in matchmaking events hosted by municipalities nationwide.
 - In fiscal 2017, all 47 prefectures in Japan earmarked budgets for such projects, totaling ¥2.35 billion, up from ¥340 million in 31 prefectures in fiscal 2012.
- An official from Niigata Prefecture said, “It’s difficult to judge how much we should offer support because it involves a person’s lifestyle and values.”
- Municipality funded matchmaking center in Matsuyama, Japan recommends people with wide range of options under one radar by leveraging the potential of big data.
 - Rate of successful matches rose from 13% to 29% between fiscal year 2015 and 2016.
 - Runs on Ehime method wherein Big Data and volunteers are the two pillars who are available for consultation.
- Along with Matchmaking initiative, municipalities should also focus on day care facilities and child care support. This will improve the belief of many who hesitate to get married and have children due to their future uncertainties.

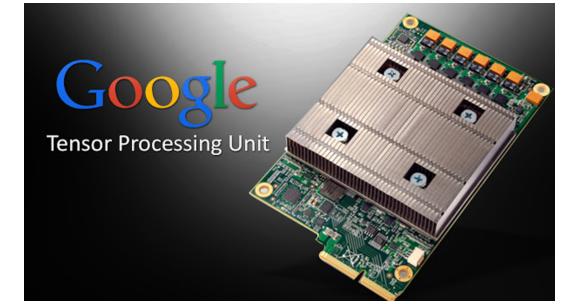
Mental Healthcare



- Natural Language Processing and Machine Learning technologies are offering exciting possibilities for the improvement of individual level mental health.
 - Tweets are being used to train a statistical Machine Learning algorithm capable of identifying depression-indicative tweets.
 - Twitter data is also used to investigate experiences of postpartum depression in new mothers.
 - Birth announcements from Twitter data using phrases such as 'it's a boy/girl' were automatically identified and then the pre and post-birth Twitter feed of the new mothers' was analyzed.
 - Using Machine Learning techniques along with analysis of pre-birth behavior patterns could predict postnatal emotional and behavioral changes with 71% accuracy.
 - Big data is also being used to augment mental healthcare at a more individual level.
 - Researchers at the University of Chicago are developing an app which monitors sleep and activity patterns to combat depression in university students.
 - App picks up on behaviors that match symptoms of depression - such as irregular movement and physical activity, disturbed or abnormal sleep patterns, social isolation, drop in class attendance and gives real-time suggestions that a counsellor would, also data is analyzed and transmitted so that the university counsellor can keep track of students and extend services to those in need.
 - Feedback informed treatments (FIT) are psychotherapy metrics drawing on historical data to predict when clients are at a risk of deterioration.
 - These metrics are surveys that clients fill in as a part of their therapy, detailing their progression through the weeks of therapy.
 - The algorithm then predicts which clients are at a high risk of drop out.
 - These metrics provides an element of blunt feedback that therapists often lack from their patients.
 - With abundance of mental healthcare apps, many of them lack an underlying evidence base, a lack of scientific credibility, and limited clinical effectiveness.
 - These apps might serve as a portable therapist - particularly in rural and low-income regions.
 - Despite the errors and risks, the big data analytics boom holds significant promise for understanding and improving mental health.

AI Chip

- Google cloud computing service will provide:
 - Exclusive access to Artificial-Intelligence chip
 - Designed to both train and execute deep neural networks – machine learning systems.
- Dubbed TPU 2.0 or the Cloud TPU, is a sequel to a custom-built processor used by Google's AI services.
 - TPU 2.0 chip can train neural network at a rate several times faster than existing processors.
 - Specifically designed for TensorFlow, neural networks software.
 - Google's TPU device spans four chips, can handle 180 trillion floating point operations per second, or 180 teraflops.
- Success of Google's cloud service will depend on how much it costs.
- Developers will have to learn new ways of building and executing neural network to experience the benefits of AI chip.



Flexi-Van Leasing Automation



- Largest chassis providers in North America with 12 locations and a fleet of more than 130,000 units to transport cargo containers to and from ships and trains.
- Main challenge is Infrastructure downtime which can backlog operations
 - Flexi-Van is using automation capabilities of InfoSight Predictive Analytics framework from Nimble Storage.
- InfoSight platform collects and analyzes hundreds of billions of sensor data points and uses predictive analysis to solve any problem.
 - Monitors infrastructure resources and identifies issue before user are impacted.
 - Identifies and detects the top 10 resource hogs which can impact performance.
 - Provides history of analytics, which helps to accurately forecast future capacity, performance, and bandwidth requirements.
- With Machine learning, the hidden trends in data can be identified automatically, which will help predict changes in market volume of imports and exports in advance, by region and geographical distribution.

Artificial Intelligence with Blockchain



- Bitcoin - Internet-based currency, allows transparency for each transfer of the currency through distributed database.
 - Each transaction is locked in a block, and blocks are connected to form a “Blockchain”.
 - Blockchain gives integrity to the complete history of the transaction, as database is write-only.
- The process of self-improving computers, AI, or machine learning has an inherent legal risk if machine learns to alter true facts.
 - Combining AI with Blockchain allows for the secure, transparent review of data.
- FDA agreement with IBM/Watson to explore the use of Blockchain to share oncology-related patient data for research.
 - IBM started offering Watson/Blockchain as a Service.
 - Blockchain technologies to keep an unalterable audit trail of all the medical data.
- Application of Blockchain will expand from medical research to real and intellectual property transaction, contracting and auditable file storage.
 - Lawyers need to have understanding of disruptive technology as more states starts recognizing the legality of Blockchain.

Big Data and Analytics in Legal Sector



- Scott Mozarsky president of Bloomberg BNA's Legal Division take on the evolution of Market disruptive technology:
 - Robots replacing lawyers in any meaningful way is remote.
 - Lawyers spent a lot of time on document production, EDiscovery helped optimize this task.
- Attorneys perform day to day practice of law tasks using machine learning and analytics
 - to identify clauses that are favor to their clients and how judges are likely to rule in cases.
 - to search thousands of documents from public and private deals
 - to generate charts and other deliverables answering a research
- Virtual receptionists, CRMs, and automated newsletters leave small law practitioners with more time to practice law.
- Terminal-Type Model in Legal Industry
 - Integrates legal, financial and business content, data, news, resources, tools and analytics into one workflow platform.
 - Helps firms to better collaborate and serve their clients.
 - Subscribers pay one annual price, enables firms to leverage technology as frequently as they wish.
- Clients can easily identify which firms have represented similar clients in different jurisdiction along with transaction details and cases they have worked on.

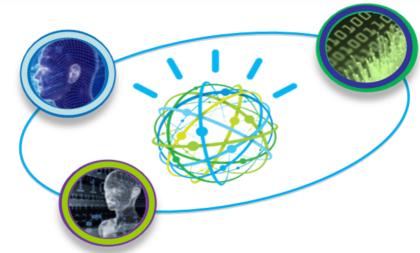
Improved patent process with AI products

- Seattle startup TurboPatent is releasing a pair of new products designed to improve the patent application process, with help of artificial intelligence.
 - Focuses on corporations and law firms, automating tasks like formatting or document preparation, freeing up people to work on more complex, high-value work.
- The new products are called RoboReview and RapidResponse.
- RoboReview uses AI and predictive analytics to automatically analyze and review draft patent applications.
 - A process that can normally take several people & multiple days to complete will reduce to seconds.
- RapidResponse helps speed up office actions, written correspondence between an applicant and patent examiner during the application process.
 - The review process is subject to human error, That leaves humans to decide whether or not to submit a patent and if so, what alterations need to be made.
- TurboPatent automates the most tedious and time-consuming parts of the process, which drastically cuts down on the likelihood of potential issues going unnoticed.



Insurers Embrace Big data

- Insurer's are keen on fintech development and using big data to better design products and handle claims in order to manage risk and lower the cost for their products.
 - It will benefit not just the insurance companies but also customers as it will drive prices down up to 30% over the following years.
- Traditionally insurance companies priced their policies on a system that relied on statistical averages which could not reflect an individual's behaviour.
 - Allianz invited drivers to take part in a voluntary monitoring system using GPS tracking for speed, driving routes, frequency and other driving behaviour.
 - The data can help determine future policy pricing, Those who drive at high speeds or who frequent accident-prone routes are likely to face higher insurance premiums.
 - If drivers know their behaviour is being tracked remotely by insurance companies, they tend to become more careful and hence reduce accidents on the road.
- Insurance companies to provide different pricing models to meet with different needs of different customers.
 - Some customers who only drive on weekends could buy motor insurance priced on per kilometer usage.
 - Allianz also applies big data on some health products such that people who have more healthy life styles would enjoy lower premiums.
- There arises a need to change ourselves very quickly to meet with the technology changes.



Transfer Credit Challenge using IBM Watson

- A Penn State team is working with artificial intelligence technology to find a solution to the cumbersome task of approving transfer credits for students wishing to enroll at the university from another institution.
- Determining how course credits will transfer from one university to another is often complex and manually intensive, and is critical to help students determine the cost of their degree.
- Current process requires students to apply and obtain an offer of admission prior to receiving transfer credit review.
 - Staff from several units across the University manually complete much of this labor-intensive process, which results in less time to be proactive with students on higher-level issues related to their academic success.
- Using IBM Watson, the team hopes to shorten the length of time it takes to give students the answers they need and provide additional services to ease their transition.
 - Teams are accessing Watson through IBM Bluemix Cloud Platform.
 - Bluemix supports various programming languages with Watson services as well as an integrated capability to build, run, deploy and manage applications on the cloud.
 - Teams are utilizing Natural Language Understanding, Tone (sentiment) Analysis, Tradeoff Analytics, Speech-to-text/Text-to-speech Conversion, Conversation Agent and Document Conversion to create their minimum viable products.
- Team has an opportunity to think critically and creatively about how to solve a serious component for student success.

BP looks at big data to help weather weak oil price



- The UK oil group is planning a fivefold increase in its data capacity over the next three years for BP's exploration and production business.
 - BP is aiming to raise its data storage capacity from about 1 PB to 6PB by 2020 as the group integrates machine learning and artificial intelligence into its operations.
- More than 99% of oil and gas wells operated by BP around the world are equipped with sensors that produce a constant flood of real-time data on production performance as well as the condition of infrastructure .
 - This information is fed into a cloud-based storage system which allows BP engineers anywhere in the world to access the information.
 - The vision is to have absolute knowledge of what's going on in the field.
 - To improve reliability and safety by predicting what is going to happen before something goes wrong.
- BP has faced added pressure to improve monitoring after the blowout on its Deepwater Horizon platform in 2010 killed 11 men, spilled 3m barrels of oil into the Gulf of Mexico and cost the group \$62bn in fines, compensation and clean-up costs.
- “Digital twin” system allows BP engineers to test maintenance procedures and other critical engineering work using virtual reality before carrying out the work on real facilities.
 - Machine learning would allow BP to use accumulated data from drilling operations to improve speed and success rates in future wells.
 - Automation would reduce the number of people needed to operate some facilities, including offshore production platforms
 - Putting data at the fingertips of engineers and scientists allows them to spend more time doing high-value work rather than putting Excel spreadsheets together.
- We see a symbiotic relationship between machines and humans where artificial intelligence optimizes the choices for people to make.