Agenda

- What is AI?
- Why AI?
- How does it work?
- Some examples of tools the use AI today
- Cloud products that offer AI tools
- Research areas in the field of Tax and Accounting
- Demo
Artificial Intelligence. What is it?

- [https://www.tutorialspoint.com/artificial_intelligence/artificial_intelligence_overview.htm](https://www.tutorialspoint.com/artificial_intelligence/artificial_intelligence_overview.htm)
- “The Science and Engineering of making intelligent machines, especially intelligent computer programs.” – John McCarthy
- Making software, computers, robots to think intelligently similar to human brain.
- AI algorithms are based on studies of how humans adapt and learn

Why AI?

- Work 24/7
- Accurate and repetitive
- Very large volumes of fact based decisions
- Focus on providing solutions to customers rather than working on mundane repetitive tasks
Why Now?

- AI has existed since the 1960s but the cost of computation was high

- Exponential growth of Computing power
- Your smart phone is millions of times more powerful than all of NASA's combined computing in 1969.
- By 2050 $1000 could be the computing power equivalent to 1 human brain (Technological Singularity)
- $100,000/GB in 1978 and in 2018 $7/GB

Exponential growth

- Era of PCs 1980s
- Internet in 1990
- Social media in 2010
- Robotics, AI, IoT, Blockchain, self driving cars all before 2020 and it is going to speed up
- AI is going to be an integral part of our lives

How do Computers become Intelligent?

- Complex Software that mimics the learning patterns of human brain
- Machine Learning (ML) is one such technique

“A computer program is said to learn from experience E with respect to some task T and some performance measure P, if its performance on T, as measured by P, improves with experience E.” -- Tom Mitchell, Carnegie Mellon University

So for a program to predict, for example, traffic patterns at a busy intersection (task T), you can run it through a machine learning algorithm with data about past traffic patterns (experience E) and, if it has successfully “learned”, it will then do better at predicting future traffic patterns (performance measure P).

Machine Learning

Two broad methods

- **Supervised machine learning**: The program is “trained” on a pre-defined set of “training examples”, which then facilitate its ability to reach an accurate conclusion when given new data.
  - Ex: Predicting cost of a house based on square footage, location and other parameters.

- **Unsupervised machine learning**: The program is given a bunch of data and must find patterns and relationships therein.
  - Ex: What words always appear together, close-knit groups of friends in social network data.


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**Machine Learning - Example**

*For simplicity let us house price (h) prediction as an example that is dependent on only one factor x, predictor would look like this*

\[
h(x) = \emptyset_0 + \emptyset_1 x
\]

\(\emptyset_0 \text{ and } \emptyset_1\) are constants goal of machine learning would be to perfect these two values using some training data.

Machine Learning - Example

- Initializes $\emptyset_0$ and $\emptyset_1$ with some reasonable values
  - $h(x) = 10 + 1(x)$

![Graph showing home prices in 100Ks](Image)

Machine Learning - Example

- Adjusts $\emptyset_0$ and $\emptyset_1$ until the predictions are closer to what is expected
  - $h(x) = 11 + .5(x)$

![Graph showing home prices in 100Ks](Image)
Applications of AI

- **Gaming** – AI plays crucial role in strategic games such as chess, poker, tic-tac-toe, etc., where machine can think of large number of possible positions based on heuristic knowledge.

- **Natural Language Processing** – It is possible to interact with the computer that understands natural language spoken by humans.

- **Expert Systems** – There are some applications which integrate machine, software, and special information to impart reasoning and advising. They provide explanation and advice to the users.

Applications of AI

- **Vision Systems** – These systems understand, interpret, and comprehend visual input on the computer. For example,
  - A spying aeroplane takes photographs, which are used to figure out spatial information or map of the areas.
  - Doctors use clinical expert system to diagnose the patient.
  - Police use computer software that can recognize the face of criminal with the stored portrait made by forensic artist.
Applications of AI

- **Speech Recognition** – Some intelligent systems are capable of hearing and comprehending the language in terms of sentences and their meanings while a human talks to it. It can handle different accents, slang words, noise in the background, change in human’s noise due to cold, etc.

- **Handwriting Recognition** – The handwriting recognition software reads the text written on paper by a pen or on screen by a stylus. It can recognize the shapes of the letters and convert it into editable text.

Applications of AI

- **Intelligent Robots** – Robots are able to perform the tasks given by a human. They have sensors to detect physical data from the real world such as light, heat, temperature, movement, sound, bump, and pressure. They have efficient processors, multiple sensors and huge memory, to exhibit intelligence. In addition, they are capable of learning from their mistakes and they can adapt to the new environment.
AI already a part of daily lives – Consumer products

- Siri/Alexa/Google/Cortana - A pseudo-intelligent digital personal assistant. She uses machine-learning technology to get smarter and better able to predict and understand our natural-language questions and requests.

- Bing/Google – AI based search engine the provides contextual information along with the results.

- Tesla – Predictive capabilities that enables Self driving.

- Amazon – AI algorithms predicting just what we're interested in purchasing based on our online behavior.

- Netflix – Algorithms that show movies based on what we watched and liked or did not like.
What about the professionals

- CCH Axcess IQ – Predictive Intelligence that suggests new services, compliance impacts across existing clients when legislative changes occur, eliminating the need for manually reviewing and searching for impacted clients.
- Audit Accelerator - Cloud-based data extraction and analytics software for accountants, automates and streamlines audit preparation, enabling firms to provide value-added services to their clients. Depending on the size of an audit, you can save as much as 40 to 48 hours per engagement.
- ProSystem fx Scan – Uses OCR for text recognition and patterns to figure out the type of file ex: W2, 1099.

Bookkeeping

- AI and machine learning technologies to bookkeeping, is becoming a reality with most of the major accounting software vendors (Intuit, OneUp, Sage, and Xero) currently offering capabilities to automate data entry, reconciliations and more.
What to come next

- In the world where companies are completely digitalized, employ robotics and the Internet of Things, audit and tax firms will need to integrate AI technologies into the way audit and tax engagements are conducted to stay relevant to clients.
- We could be at a place where audit and tax compliance is happening on a continuous basis allowing the professional to focus on providing value services to their customers efficiently and accurately instead of spending their time on repetitive tasks.

How to be prepared

- Practicing professionals, including auditors, consultants, accountants and tax practitioners need to start accepting that, sooner or later, AI will be an integral part of the industry. Start working with
  - Educators and training providers, who are considering the future skills of accountants
  - Regulators, who are considering the risks attached to new technologies
  - Governments and policymakers
  - Computer scientists and machine learning experts who understand the strengths and limits of AI
  - Software providers who are developing solutions for accounting problems using AI.

AI driven Engagement conversation

- Consider a preparer meeting a new client to get general understanding and have an intelligent conversation.
- **Without AI:** In case of an experienced preparer, there would be wealth of experience that could drive the conversation and quickly offer additional services or it could be a novice to the field and may not be able to offer services like the experienced.
- **With AI:** An AI assistant that picks up the context of the conversation and quickly start to show relevant data could make the novice very experienced and make the experienced more accurate.

Thank You
Reference

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