

Current and Emerging Data Technologies



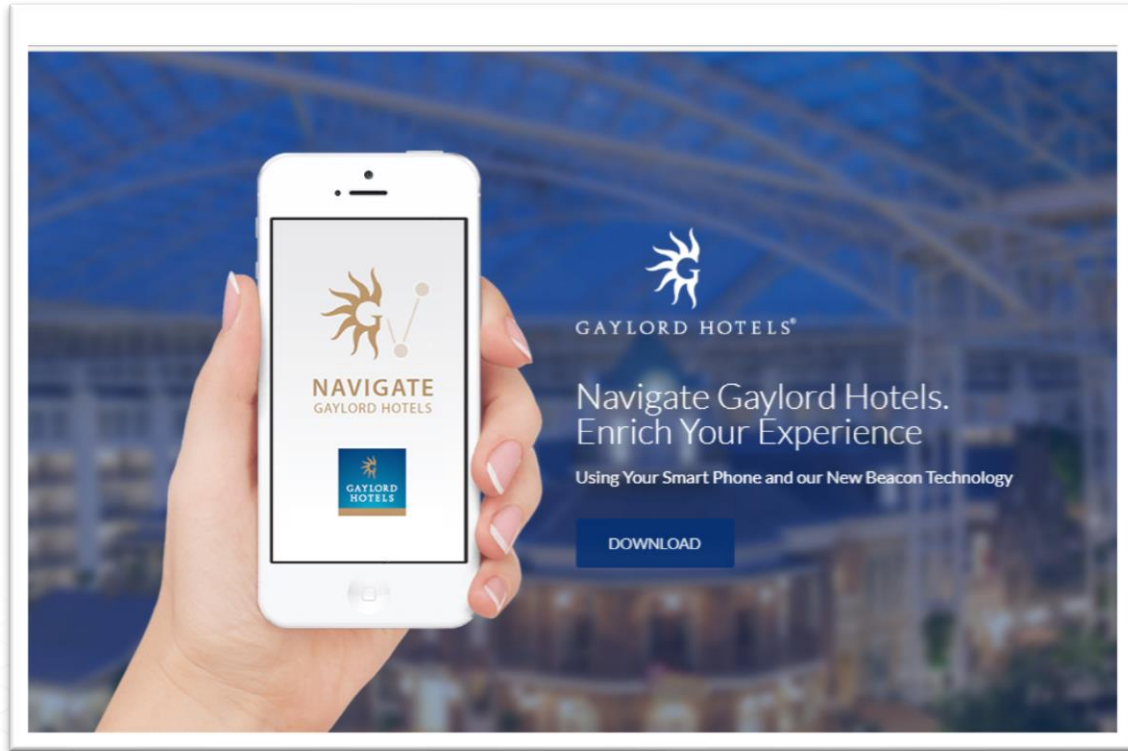
Purpose

- » 1. To provide an introduction to current and emerging technologies
- » 2. To ponder how these technologies may impact measurement
- » 3. To anticipate potential challenges associated with using these technologies

Agenda

- » **Big data**
- » **Blockchains**
- » **Artificial Intelligence (AI)**

Big Data



Big Data Trends



- » 20 billion connected devices by 2020 (2.5 devices per person)
- » Increase in data governance and privacy regulations



Possible Big Data Applications in Testing



- » Expansion of sources for gathering measurement data
 - Cloud computing
 - Mobile devices
 - Other devices
- » Measurement without a test

Big Data Challenges

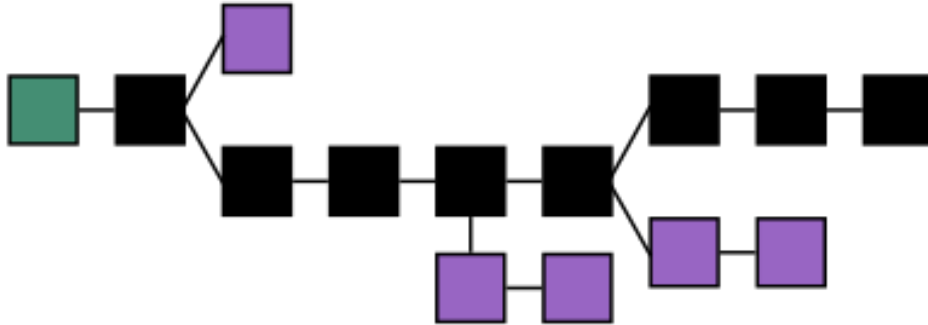


- » Candidate authentication
 - How do we know it is really the candidate performing the tasks?
- » Candidate privacy and regulation
 - How do we receive permission to access an individual's data?
- » New models of measurement
 - How do we use this data to perform meaningful measurement?

Blockchain



- » **The Blockchain** is a public ledger where transactions are recorded and confirmed. It's a record of events that is shared between many parties.

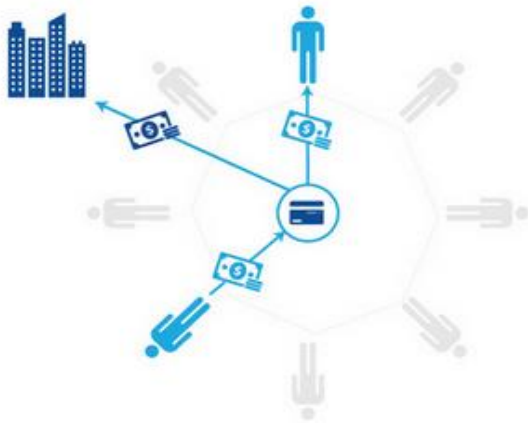


- » Each block holds a valid batch of time-stamped transactions and is connected to the preceding block – thus forming a chain.

Blockchain



- » Blockchains are decentralized reducing security risks and transaction overhead associated with centralized data processing.



Blockchain



- » Blockchains are intended to be transparent and make accurate, updated information available to multiple systems for easier use and verification
- » Once information is entered into a block, it cannot be altered.
- » Blockchains provide a standard for how information is stored and shared.

Blockchain Trends



- » Expansion of blockchains from cryptocurrencies to other fields like education, training and testing
- » Increased regulation and oversight from governing bodies and consortiums

Possible Blockchain Application in Testing



- » Provide an open, standardized platform for credential record keeping
- » Simplify verification of credentials by employers, regulators and other governing bodies
- » Provide potential access to other important candidate information used in credentialing such education, work history, and training
- » Provide additional protection and security

Blockchain Challenges



- » Selection and adoption
 - How do we know which blockchain(s) to use?
 - Which blockchains will be adopted by the industry?
- » Candidate privacy and regulation
 - How much control should a candidate have over publishing their information to a blockchain?
 - Under GDPR, how do you handle the candidate's right to be erased?

Artificial Intelligence



- » **Artificial Intelligence** is the development of automated systems to able to perform tasks that normally require human intelligence.

Artificial Intelligence



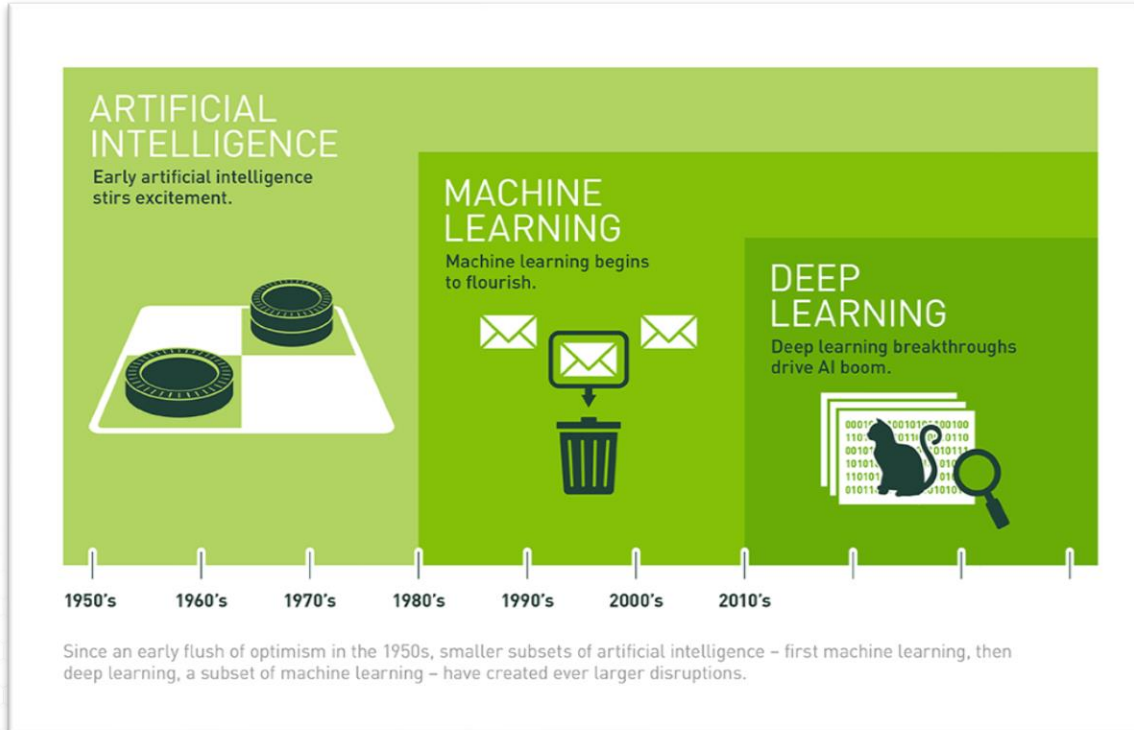
» **General AI**

- Has all of the characteristics of human intelligence like planning, understanding language, recognizing objects and sounds, learning, and problem solving.
 - Terminator

» **Narrow AI**

- Exhibits some facet(s) of human intelligence, and can do that facet extremely well, but is lacking in other areas.
 - A machine that's great at recognizing images, but nothing else, would be an example of narrow AI.

Artificial Intelligence



Artificial Intelligence



» Machine Learning

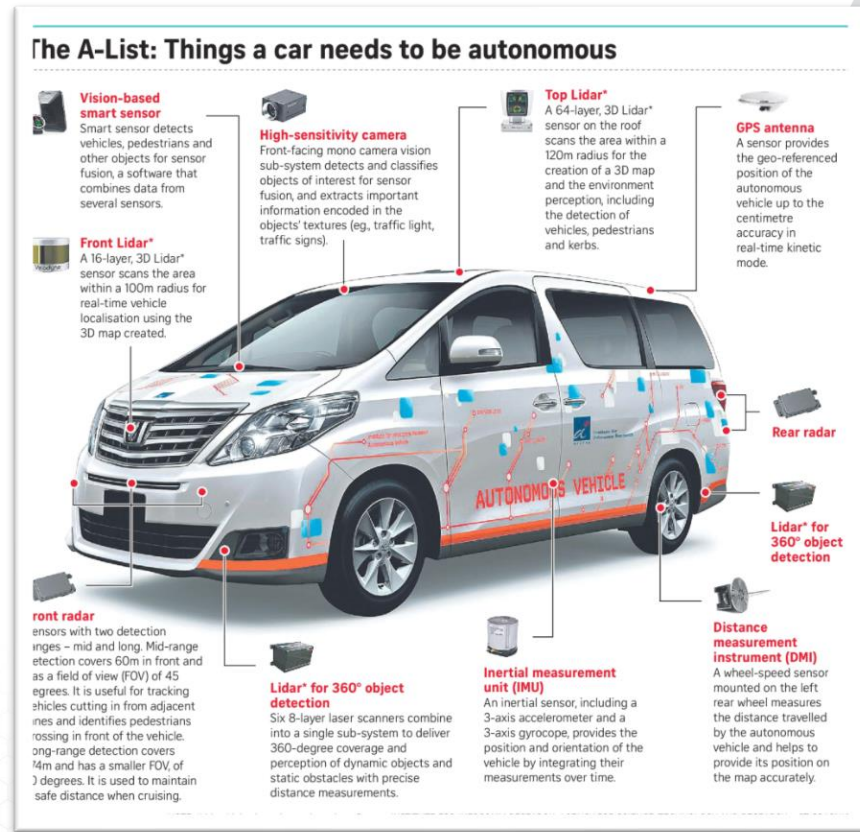
- At its most basic form, machine learning is the practice of using algorithms to parse data, learn from it, and then make a determination or prediction about something in the world.

The screenshot displays a real estate listing on a website. On the left, there is a satellite map view of the property. The main listing area includes the address "1944 W Golden Pond Way, Orem, UT 84058" and details such as "3 beds - 3 baths - 1,954 sqft". A prominent feature is the "Zestimate" of "\$342,272", which is circled in red. Below the Zestimate, it shows "EST. REFI PAYMENT \$1,528/mo". To the right of the listing, there is a badge that says "Home Shoppers are Waiting" with a green icon and text indicating "42 shoppers are looking in your neighborhood and price range".

Artificial Intelligence

» Deep Learning

- Deep learning structures algorithms in layers to create an “artificial neural network” that can learn and make intelligent decisions on its own.



Artificial Intelligence



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IBM Plans to Acquire The Weather Company's Product and Technology

Possible AI Applications in Testing



- » Scoring of unstructured data
- » Smarter more capable technology
- » Able to make decisions at the individual level

Artificial Intelligence



- » Require large amount of data
 - How much data is required to build the appropriate algorithms?
- » Evolving technology
 - What is the pace of change for the technology used by the candidate?
- » Shifting expectations
 - How does AI change what is expected from a candidate?
- » Candidate authentication
 - How do we know the candidate is the one supplying the data?
- » Candidate privacy
 - How much control should a candidate have over their data?