

ThoughtWorks®

INTELLIGENCE AS A SERVICE

2017 ThoughtWorks Radar Theme

THE LAND OF CANAAN WHICH BIG DATA PROMISED



DATA will be the only differentiator, and every company will be a DATA company



Key Objectives



BUT HOW?

MACHINE LEARNING

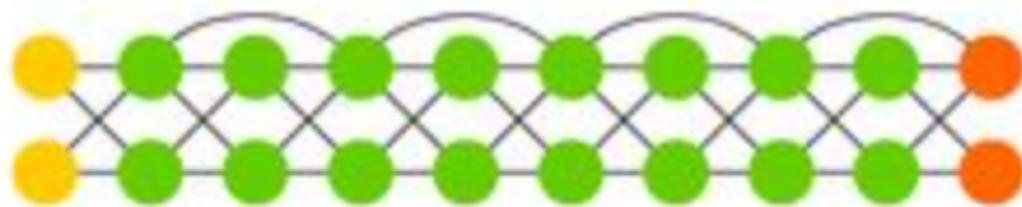
Recurrent Neural Network (bi)



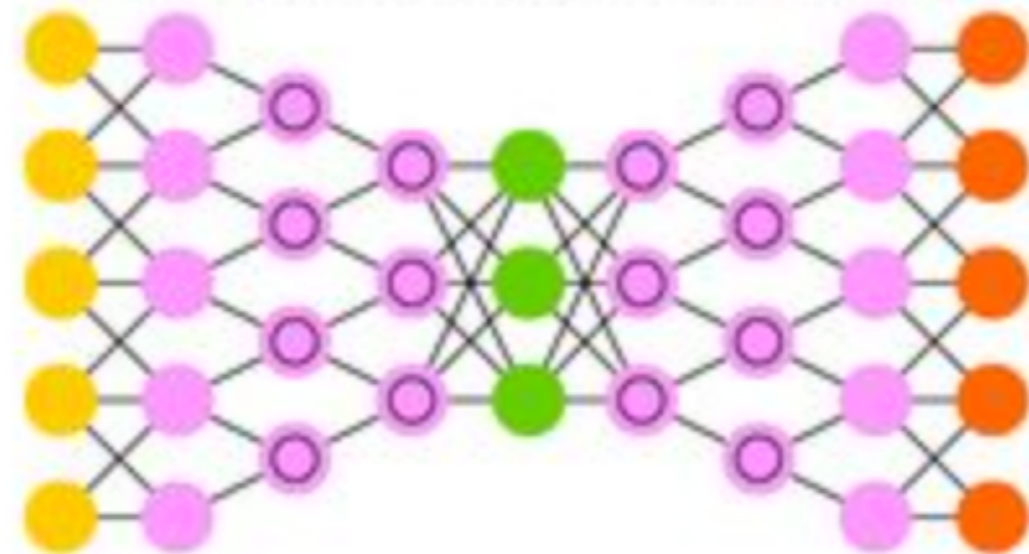
Support Vector Machine



Deep Residual Network



Deep Convolutional Inverse Graphics Network



MACHINE LEARNING

- Same machine, different training data will result in different *behaviors*.
- Data just the RAW MATERIAL, *intelligences* built from them are the secret sauce.
- A much more harder competitive advantage to *be copied*.

TWO TYPE OF INTELLIGENCES

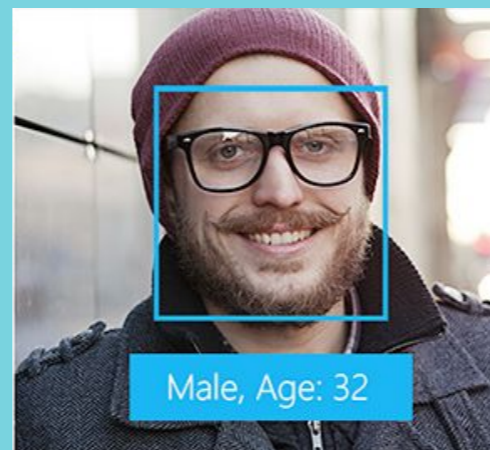
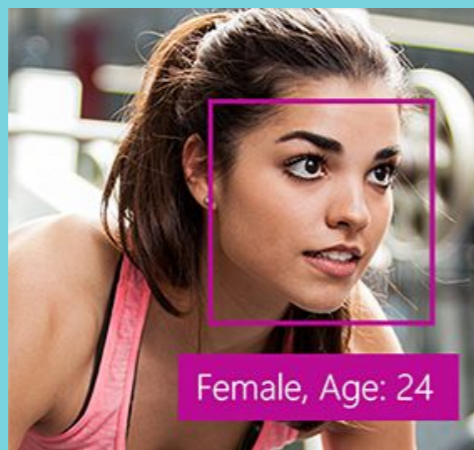
INTELLIGENCE ENABLES NEXT- GENERATION USER EXPERIENCE

INTELLIGENCE



Redeem your gift card using your computer's camera.

This requires a gift card with a box around the code, as shown here.



34. [api.ai](#) new

In parallel with the recent surge of chatbots and [voice platforms](#), we've seen a proliferation of tools and platforms such as [api.ai](#) that provide a service to extract intent from text and management of conversational flow that you can hook into. Recently acquired by Google, this "natural-language-understanding as a service" offering competes with other players in this space such as [wit.ai](#) and Amazon's [Lex](#).

[History](#)

50. [Voice platforms](#) new

Voice platforms such as [Amazon Alexa](#) and [Google Home](#) are riding high on the hype cycle; some even herald the ubiquity of the conversational voice interface. We're already integrating conversational UIs into products and seeing the impact of this new interaction in how we design interfaces. Alexa specifically was built from the ground up without a screen and treats the conversational UI as first-class. But it's still too early to believe the hype, and we expect more big players to get in the game.

[History](#)

52. [wit.ai](#)

Hype surrounding machine intelligence has reached a crescendo, but as with Big Data, useful frameworks and tools are waiting to be discovered among all the hot air. One such tool is [wit.ai](#), a SaaS platform that allows developers to create conversational interfaces using natural language processing (NLP). Wit works with either text or speech inputs, helps developers manage conversational intent and allows custom business logic to be implemented using JavaScript. The system is free for commercial and noncommercial use and encourages the creation of open applications. Be aware that you must agree to let Wit use your data in order to improve the service and for its own analysis, so read the [terms and conditions](#) carefully. Another contender in this space is the [Microsoft Bot Framework](#), but it's available only in limited preview form as of this writing. As with most things Microsoft, we expect the Bot Framework to evolve quickly, so it's worth keeping an eye on.

36. [Cloud-based image comprehension](#) new

Image comprehension used to be a dark art and required a team of onsite data scientists. In recent years, however, we've come closer to solving problems such as image and facial classification/categorization, facial comparisons, facial landmark identification, and facial recognition. **Cloud-based image comprehension** provides access to machine-learning capabilities through services such as [Amazon Rekognition](#), [Microsoft Computer Vision API](#) and [Google Cloud Vision API](#) which can supplement AR applications and anything involving photo tagging and classification.

INTELLIGENCE THAT BUILT FROM YOUR CORE DATA

Platforms

TensorFlow

ASSESS ?

Google's [TensorFlow](#) is an open source machine-learning platform that can be used for everything from research through to production and will run on hardware from a mobile CPU all the way to a large GPU compute cluster. It's an important platform because it makes implementing deep-learning algorithms much more accessible and convenient. Despite the hype, though, TensorFlow isn't really anything new algorithmically: All of these techniques have been available in the public domain via academia for some time. It's also important to realize that most businesses are not yet doing even basic predictive analytics and that jumping to deep learning likely won't help make sense of most data sets. For those who do have the right problem and data set, however, TensorFlow is a useful toolkit.

92. DeepLearning.scala new

[DeepLearning.scala](#) is an open source deep-learning toolkit in Scala created by our colleagues at ThoughtWorks. We're excited about this project because it uses differentiable functional programming to create and compose neural networks; a developer simply writes code in Scala with static typing. DeepLearning.scala currently supports basic types such as float, double, GPU-accelerated N-dimensional arrays as well as algebraic data types. We're looking forward to future releases of the toolkit which are said to support higher order functions and distributed training on [Spark](#).

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