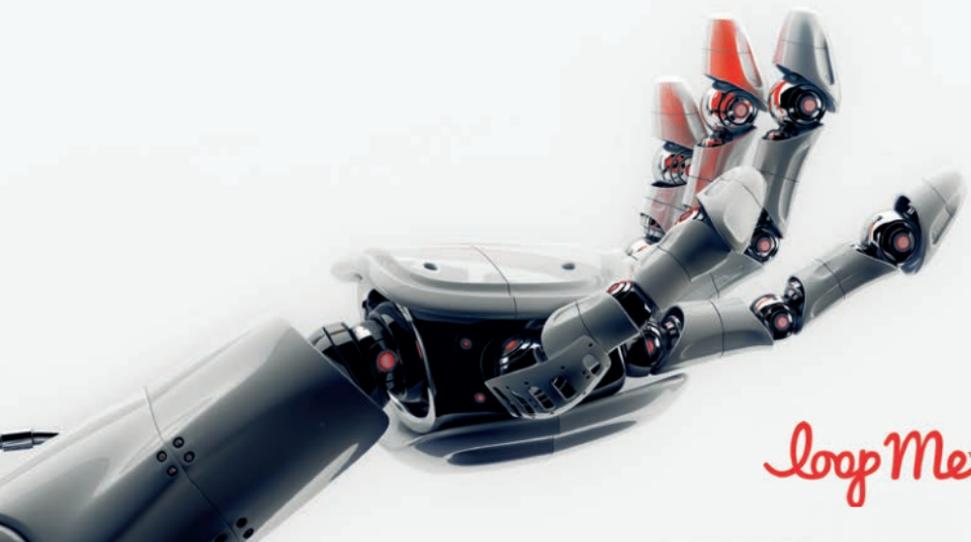


# ai

## The Guide



*loopMe*

$$\hat{y}(\mathbf{X}) := \omega_0 + \sum_{i=1}^n \omega_i x_i$$

*"Today's AI is about new ways of connecting people to computers, people to knowledge, people to the physical world, and people to people."*

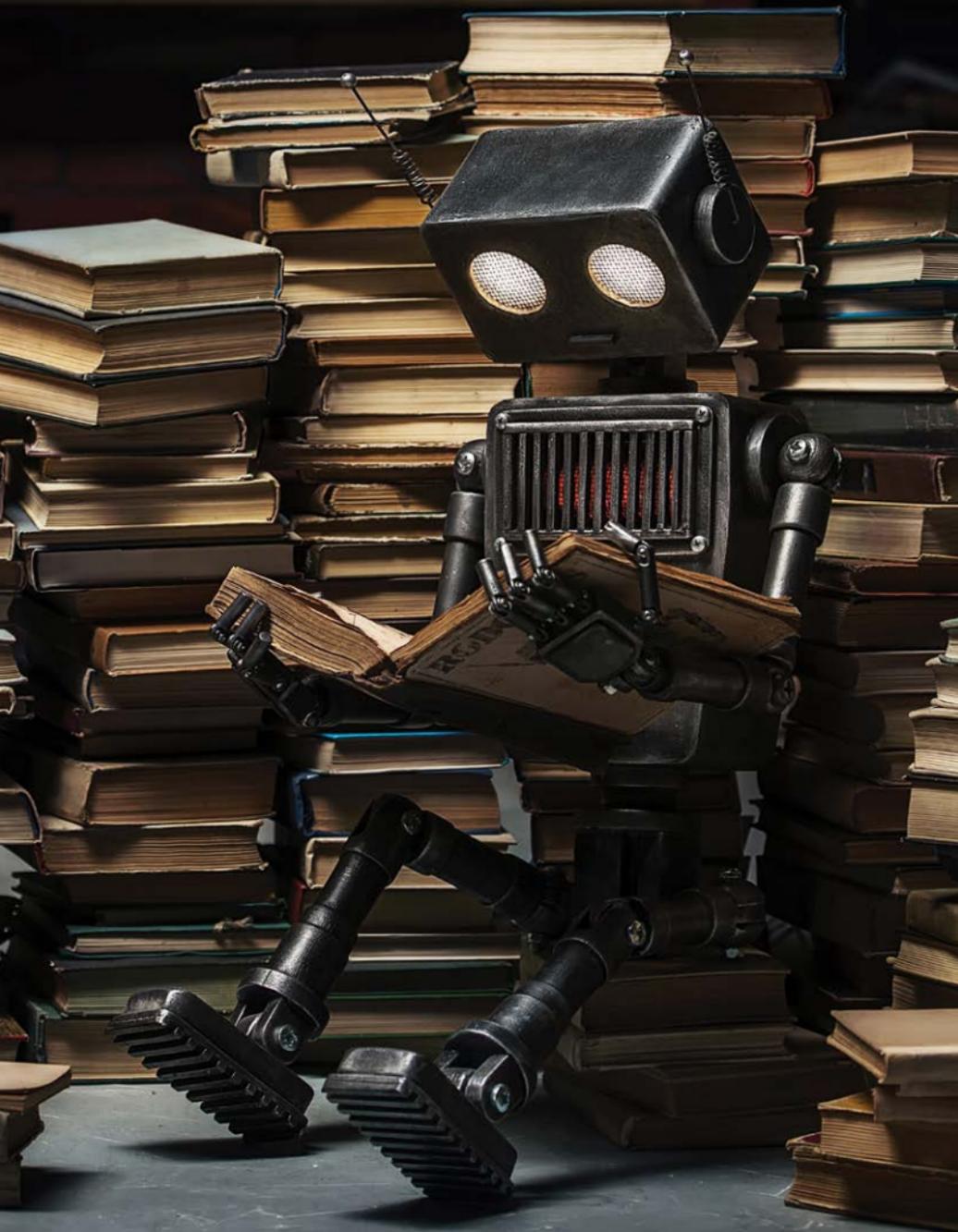
PATRICK WINSTON, MIT AI Lab briefing, 1997

80% of marketing leaders think Artificial Intelligence will revolutionize marketing, but just 26% say they have a confident understanding of it.

LoopMe's Data Science team have created a guide to AI, with everything from the history of the field, to technical definitions, down to the questions you should be asking your AI provider.

Keep this booklet to hand and you'll never be thrown in at the deep end of AI again.

*LoopMe*





# A BRIEF HISTORY OF ARTIFICIAL INTELLIGENCE



**ARTIFICIAL INTELLIGENCE** was founded on the claim that human intelligence 'can be so precisely described that a machine can be made to simulate it'.

Stories of artificial beings capable of human thoughts have been around for thousands of years. Our modern concept of AI as a field started in the 1930s, with the Church - Turing thesis that a computer could simulate any act of mathematical deduction – a concept which is widely known and accepted today.

In 1956 the field of AI Research was founded at a conference at Dartmouth College. The programs devised by their attendees astonished the world; computers who could win at checkers, solve word problems in algebra and speak English.

Today, AI systems have beaten human players at poker, created self-driving cars and are even diagnosing cancer in remote areas of China. It is almost impossible to predict the developments which will take place in the field over the next 50 years.

# Artificial Intelligence Milestones



1930's

Church-Turing concept

Game theory created

1945



1950

Alan Turing creates the Turing Test



Field of AI created at Dartmouth

1956



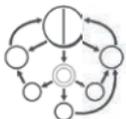
1964

Eliza 'mother' of all chatbots created



Rule based approach to diagnoses of medical illnesses

1974



1978

Herbert A. Simon is awarded Nobel Prize in Economics for his theory of bounded rationality, a cornerstone of AI



First AI driven Robot Car (gets up to 55mph on empty streets)

1986



1993

Polly, the first robot to navigate using vision & operate at animal speeds, created





1997

Deep Blue defeated the reigning World Chess champion Garry Kasparov

Tiger Electronics launch the 'Furby'

1998



late 1990's

Web crawlers and other AI based programs become essential as part of World Wide Web

NASA's robotic exploration rovers explore the surface of Mars

2004



2011

IBM's Watson defeats human champions at Jeopardy!

AlphaGo defeats human champion at Go

2015



2016

Microsoft develops AI system that achieves parity with humans in speech recognition

Pro Poker players beaten by AI program Libratus

2017



NOW

What's next?

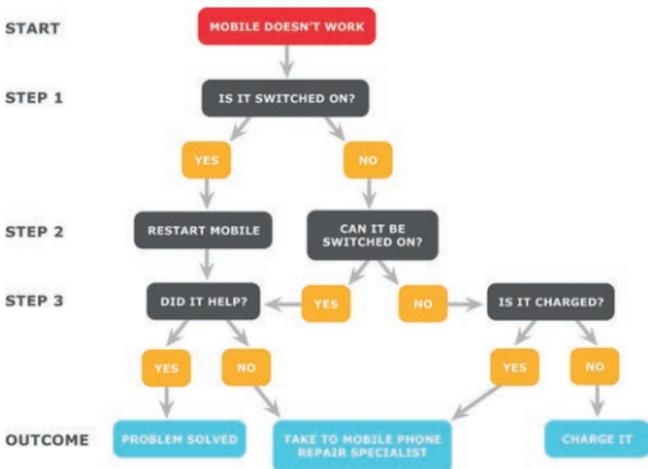


# KEY WORDS AND EXPLANATIONS



## ALGORITHM

An algorithm is a self-contained sequence of instructions, usually written by a programmer, to be performed repetitively, without adaptation.



## ARTIFICIAL INTELLIGENCE

Artificial Intelligence is the development of computer systems able to perceive its environment and take actions to maximize its chance of success at any given goal.

*What is the difference between AI and an algorithm?*  
An algorithm is programmed to do one thing, over and over again (for example, deliver ads in the cheapest manner). It cannot predict success or adapt over time without reprogramming.



## KEY WORDS AND EXPLANATIONS



### **MACHINE LEARNING**

Machine Learning is an important part of AI. Machine learning is an algorithm which self-learns and improves itself based on previous outcomes, without reprogramming.

All AI will incorporate machine learning as part of its larger algorithm, but not all companies who work with machine learning will be using artificial intelligence. Machine learning cannot make decisions in the way AI does, it only learns from what it has seen before.



### **BIG DATA**

Big Data is complex data sets which can be used to identify wide-scale trends.



## KEY WORDS AND EXPLANATIONS



### **IMAGE RECOGNITION**

AI looks for patterns in images. Machines can analyze many more images than humans and can identify what's in the images and reveal patterns that people would never detect. Brands can use image recognition technology, for example, to find every photo online in which their logos appear.

### **NATURAL LANGUAGE PROCESSING**

Natural Language Processing is a technology that enables machines to interpret what people are saying in words or in text. Sophisticated AI can understand speech and tone, not just understanding the words but the context.

### **CHATBOT**

A chatbot is a computer program which carries out a conversation through auditory or textual methods. These programs are often used on retail websites or within personal assistant applications (e.g. Siri).

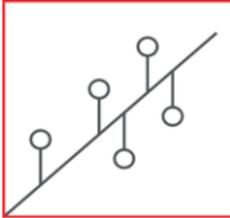
### **DEEP LEARNING**

Deep Learning is a more advanced branch of machine learning, where a computer teaches itself with only minimal amounts of programming. Deep learning is data & computational resource hungry and given adequate quantities of these, marketers can make the most use of data and apply it to make predictions about consumer behavior.



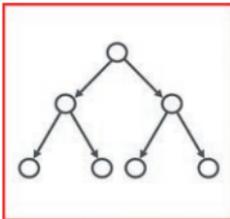


# KNOW YOUR ALGORITHMS



## REGRESSION ALGORITHMS

Regression algorithms are a statistical process for estimating the relationship among variables – for example, what is the link between being a driver and living in the country. Regression methods are used extensively in statistical machine learning.



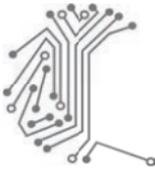
## DECISION TREE ALGORITHMS

Decision tree methods construct a tree model of the world, similar to a flow chart. They explore multiple avenues at once, are often fast and accurate, and a big favorite in machine learning.



## BAYESIAN ALGORITHMS

Bayesian methods are those that explicitly apply Bayes' Theorem to calculate probabilities of certain events happening based on certain previous events. For example, the probability of a user engaging with an ad from a brand if in the past they have watched ads for the brand in full.

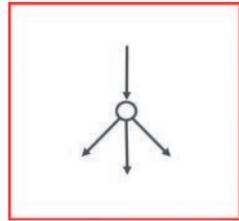


# KNOW YOUR ALGORITHMS



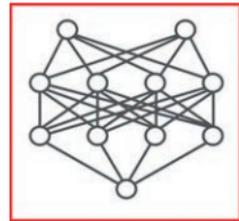
## ARTIFICIAL NEURAL NETWORK ALGORITHMS

Artificial Neural Networks are models that are inspired by the structure and/or function of biological neural networks. Like human brains, ANNs learn by example and are composed of a large number of highly interconnected processing elements working in unison to solve specific problems.



## DEEP LEARNING ALGORITHMS

Deep Learning methods are a modern update to Artificial Neural Networks that exploit abundant cheap computation. They are concerned with building much larger and more complex neural networks and are often used on large datasets that contain very little labelled data.





## HOW AI CAN BE USED IN ADVERTISING



### THE CREATIVE

By feeding in thousands of images, video clips and literary text, AI engines have been used to generate creatives. It is an imperfect science but in 2016 McCann used their new “AI Creative Director” to create a video ad using artificial intelligence. While AI systems aren’t likely to replace creative teams any time soon, they have managed to produce some passable poetry.

One of the poems below was written by an Artificial Intelligence engine.

#### *Poem A*

It is important to keep old hat  
in secret closet.

#### *Poem B*

Look up now, there is  
a definition coming through  
the river of light.

*\* Poem A was written by poet Ted Berrigan,  
Poem B was created by an AI engine.*



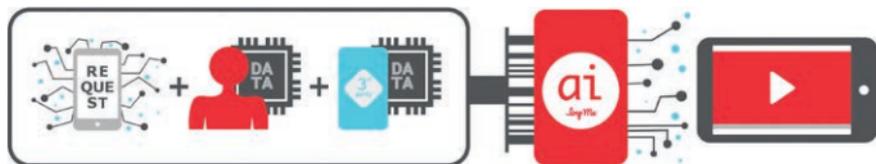
# HOW AI CAN BE USED IN ADVERTISING



## THE DELIVERY

Artificial Intelligence can be used during ad campaigns to assess the likelihood of an advert delivering the desired outcome (often a click or view). It does this by accessing historic and current data from the ad request, considering the impact multiple factors may have on the probability of the user completing the action. It is also used to determine an optimal bid price for each request on RTB exchanges, thereby reducing costs.

By using AI in delivery, ad requests which are not likely to generate the desired outcome are discarded, improving overall performance for the same budget.

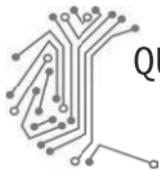


Data from request, historic user data & Third Party Data Integrations are stored in LoopMe's Mobile DMP. AI analyses data to determine the likelihood of delivering the desired outcome (click, view etc.) If it's high enough (e.g. 80%) the ad is served.



Machine Learning is then used to learn from each impression outcome and improve probability calculations over time. This is used to optimize campaign results in real-time by identifying the users who are most likely to react in a certain manner.

- AI calculates probability of engagement
- AI self-learns every 10 Minutes
- Learnings applied to future users



## QUESTIONS TO ASK YOUR PROVIDERS ABOUT THEIR AI TECHNOLOGY



(and the answers you want to hear)

1. *Do they use AI to target segments or individuals?*

Targeting to individuals shows a more general and powerful approach.

2. *Is it rule-based or model-based?*

Rule-based is not learning. It is inherently limited by fallible human knowledge. In contrast, model-based systems learn from data.

3. *What data do they use to build their models - full customer histories or some sub-set of the data?*

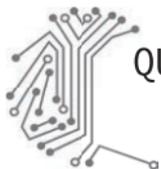
A sub-set shows a limited approach that is probably only designed to work in a niche market.

4. *How frequently are models updated?*

Anything less than daily will result in a reduction of performance over time.

5. *How do they measure performance of their models?*

Concurrent, persistent control groups is the gold standard (for example 10% of a campaign's impressions). Comparison to a campaign in the past is completely unreliable.



# QUESTIONS TO ASK YOUR PROVIDERS ABOUT THEIR AI TECHNOLOGY



(and the answers you want to hear)

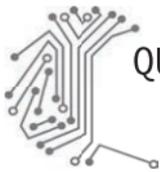
6. *What algorithms do they use and what is their overall AI methodology?*

This is a difficult one to judge. But your provider should be able to tell you and share information on their methodology.

7. *Do they have a mobile DMP and what data is used?*

Without a large data set to learn from AI is essentially useless. It needs to be built on and trained by very large sets of data in order to work efficiently.





## QUESTIONS TO ASK YOUR PROVIDERS ABOUT THEIR AI TECHNOLOGY



(and the answers you want to hear)

8. *What is the background of their Data Science team?*

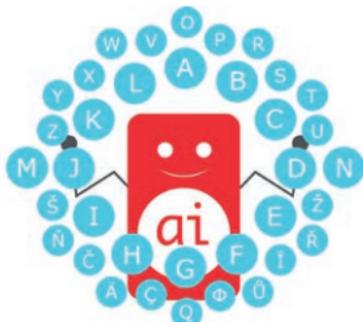
AI might be a relatively new discipline in digital advertising but it's definitely not a new sector. Check the experience of their data science team to make sure they have experts working on the solution.

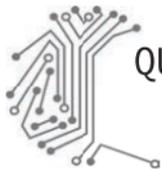
9. *What proportion of the positive events can their models clearly predict in 10% of the available inventory?*

Strong AI models should be able to predict with over 50% accuracy.

10. *What variables do they work with?*

There are 100s of different variables in each ad request – all of these factors can have an impact on the final outcome.





## QUESTIONS TO ASK YOUR PROVIDERS ABOUT THEIR AI TECHNOLOGY



(and the answers you want to hear)

11. *What is the scale of the inventory that they access (drives ability to pick best outcomes and data available)?*

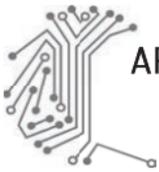
The more ad requests received the more the AI can choose impressions which are likely to deliver the desired outcome. If there are very limited opportunities to deliver an ad it becomes more difficult to generate uplift.

12. *How are they using location and location history?*

Location history can be used to build accurate user profiles which allow AI to make better decisions.



**KNOW USERS' LOCATION**  
**KNOW WHAT THEY NEED**



# ARTIFICIAL INTELLIGENCE & LOOPME



Since LoopMe's foundation in 2012, artificial intelligence has been at the heart of everything we do.

Our belief is that the feedback loop, the time it takes to assess customer's responses to an advert and for that feedback to be incorporated into the campaign's strategy, can be closed by using AI and mobile data. This technology allows brands to improve their communications, creating a better user experience and enhancing consumer relationships.

We built our platform to seamlessly integrate AI, meaning our decisioning and optimization can happen in milliseconds. We have worked to build a vast store of data in our DMP, which can be used to train our intelligence systems, improving over time, to ensure your advertising is reaching customers in the moment it is most likely to change their opinion.





# ARTIFICIAL INTELLIGENCE & LOOPME



LoopMe's data science team is made up of experts in the field, who have been working in AI for decades, for the likes of MSN, Bank of America and Yahoo. Our data science teams have collaborated with the brightest minds in artificial intelligence, who have worked on Google DeepMind and the AlphaGo projects.

Artificial intelligence is the future of technology. In the next ten years it will seamlessly be incorporated into our daily lives, our smartphones, appliances and homes will be linked. Beyond our individual lives, it will transform the health sector and our justice systems, making them more efficient, effective and fair.

We are standing on the edge of the next revolution, and the impact it has on our society will be as large as the industrial revolution of the 1800s.

I look forward to working with you as we move into the age of artificial intelligence.

**Stephen Upstone,**

CEO & Co-Founder, LoopMe



## ADVANCED ARTIFICIAL INTELLIGENCE AWARD

80% of marketing leaders think Artificial Intelligence will revolutionize marketing, but just 26% say they have a confident understanding of it.

### **Enhance your career with the only course designed for Artificial Intelligence in ADVERTISING by AI experts.**

The advanced artificial intelligence award was designed to educate and equip brand-side marketers, media agency planners and advertising professionals with the tools to effectively utilize AI in their ad campaigns.

Artificial intelligence is the latest innovation to hit the technology industry, but for those new to artificial intelligence, it can be difficult to tell the difference between clever marketing spin and AI fact.

### THIS COURSE WILL PROVIDE:

- A review of the origins of artificial intelligence
- A detailed introduction into the mathematics and algorithms behind artificial intelligence
- The future of artificial intelligence and how it will change our society
- The impact AI can have on marketing
- Deepdive on AI and advertising
- How to plan for AI results

Find out more about the Advanced AI Award ✉ [training@loopme.com](mailto:training@loopme.com)

*loopMe*

$$\hat{y}(\mathbf{X}) := \omega_0 + \sum_{i=1}^n \omega_i x_i$$

Contact [marketing@loopme.com](mailto:marketing@loopme.com) for more information.