"How to survive an AI winter"
Dr James Luke, IBM Distinguished Engineer and Master Inventor

An AI winter, if you didn't know, is the slump that follows a huge peak of expectation for artificial intelligence, where funding dries up and professional opinion turns to pooh-poohing its potential. There was one in the late 70s/early 80s and another a decade later – apparently the last one was in 1992. During such "winters" it was not unusual for people to rubbish AI – James Luke fondly recalls a (still) senior executive at IBM telling him early in his career, "If you want to get anywhere in this company, get out of AI".

But even Luke concedes that it's not surprising there were doubters, given the scale of the challenge.

"What we are trying to do with AI is to recreate the intelligence of the human brain, and that is the biggest engineering challenge humanity has ever faced," said Luke in his opening keynote speech to the conference. "It is bigger than the Manhattan Project, bigger than the Large Hadron Collider – yet usually we are doing it with teams of two or three people."

Still, he urged delegates to be positive about AI, because if approached in the right way it can be made to work and brings huge opportunities. So, what is the "right way"?

Luke says one of the best examples of an effective AI use case is still the famous contest between the supercomputer named Deep Blue and the world champion chess player Garry Kasparov in 1997. Deep Blue had challenged Kasparov in 1996 and lost, and IBM, its architect, was determined not to repeat the failure.

IBM engineers enlisted the help of another chess grand master to help build Deep Blue, and programmed the computer to look 14 moves ahead. Essentially, it replicated a human capability, but scaled it up through huge volume. And even though Deep Blue did win the 1997 tournament, its limitations were laid bare when the grand master who helped build it said: "Deep Blue evaluates two million moves per second, I evaluate three. But how do I know which three to evaluate?" That, said Luke, perfectly encapsulates the shortcomings of artificial intelligence: "We still haven't cracked that yet, we don't understand how the grand master knows which three to evaluate. And that's a great example of the difference between intelligence and artificial intelligence. AI is not going to be better than humans – a human brain cell is massively more complex than an electronic neuron."

He adds that AI is often cited as being better than human intelligence because it doesn't forget stuff. But Luke suspects that the human ability to forget is part of being intelligent, as forgetting helps us to "generalise, experiment, and learn" – not to mention to not be overcome by all the shameful things we've done.

Luke shared three pieces of advice to make AI work:
- Select the right problem (ideally, choose something that is easy to do and brings high value to your organisation)
- Look at the data (don't just assume the data is fine, as it could easily have become corrupted or been sabotaged, and you should always be able to vouch for its provenance)
- Build systems, not algorithms. "Just throwing data at an algorithm will not work, you need to engineer it."

In summary, he said, AI should augment human beings, not completely replace them.

Ending on a positive note, Luke does not believe we will see another AI winter – he is certain that machine learning technology has convinced the doubters and is here to stay.

"The core infrastructure is now in place, we are amassing huge volumes of data, and we have sufficient processing power and storage coming available so that we can make many of the AI algorithms work.

"Those three factors mean that AI is now doable at a time when organisations see the need to gain competitive advantage. So that, I think, means it's going to keep on going.

"But I think we will stop calling it AI. That wouldn't be a bad thing, as the hype leads to bad experiences and bad engineering. There will be a process of normalisation and people will realise it's just another form of complex systems engineering."