THE SUPERPOWER OF AUTONOMOUS AI SYSTEMS

Kence Anderson
PRINCIPAL PROGRAM MANAGER, MACHINE TEACHING INNOVATION, MICROSOFT

Andy Wylie
PRINCIPAL PROGRAM MANAGER, AUTONOMOUS AI ARCHITECT, MICROSOFT

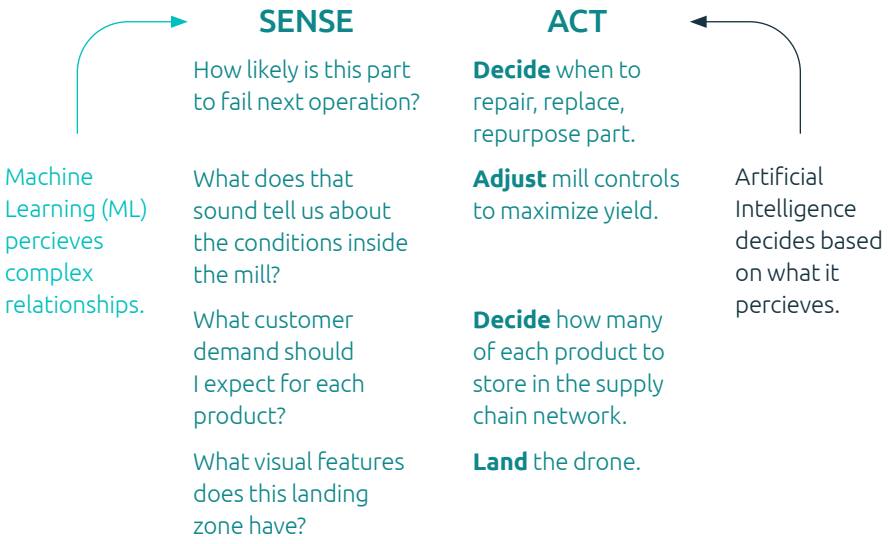
AI is finally making high-value decisions in the real world

Business decision-making is fuzzy, though, nuanced, and full of strategy trade-offs. Previously, only humans could make some of these decisions well. Still, AI has matured to the point where, for specific conclusions in controlled scenarios, it can imbue process owners with decision-making superpowers that can sense and autonomously act on behalf of the company. In addition, creating these AI systems now is within reach of business experts themselves.

Getting beyond predictions

It's one thing to predict. It's another thing to decide and act. Chatbots, predictive maintenance applications. Further, statistics dressed up as AI may provide valuable insights, perception, and correlations, but it is essential to know that AI can sense and then, in real-time, can decide and act based on what it perceives.

Here's why that's important...



Aerospace engineers at Bell Flight, for example, used the low-code AI Project Bonsai platform to train an autonomous AI to land crewless aerial vehicles using vision as its only input. Historically autonomous flying relied on GPS to navigate and land. Yet, when obstacles or buildings block GPS, vehicles must land using visual input only, and their control systems must act based on visual features, as human pilots do. Many of the most attractive use cases for AI-based autonomous systems require observable and sound, predictions, or other advanced perceptual input to decide and act well.

Applied AI brings superpowers

Not too long ago, most enterprises weren't ready for the broad-scale adoption of AI. Much changed with the COVID pandemic. The 'new' world needs better autonomous decision-making technology to adapt, succeed and improve.

Applied AI peels off the research lab layer and heads towards aspects of human-like decision-making in the real world. It dismisses the purveyors of fiction and science fiction instead of mapping the superpowers of relevant AI to gaps in existing decision-making methods. AI is not self-aware.

An AI 'brain' can only make optimized decisions for specific processes that it has been trained on and primarily based on what it has learned and has been taught. Just like a human subject matter expert learns and builds intuition process decisions through consistent practice, AI can learn how to control equipment and optimize processes by practicing over a wide variety of scenarios, to the extent that it can act autonomously on our behalf. Here are three distinguishing characteristics that allow AI-based autonomous systems to make and execute high-value decisions in the real world:

- Learning from trying
  Thanks to simulating at a hyper-scale on cloud platforms like Microsoft Azure, machine teachers can translate decades of experience data into curriculums that set relevant goals and objectives. AI agents can then condense vast amounts of practice down into weeks, days, and even hours.

  The procedure takes place in a 'digital playground' where Deep Reinforcement Learning (DRL) algorithms can safely explore new techniques and strategies. At the same time, they learn to exploit the best of what they know to achieve the best possible decision-making and actionable outcomes.

- Planning forward
  Hindsight is a beautiful thing. Humans and AI leverage past experiences to adapt to new situations and get ahead of tricky situations. Translating hindsight into foresight by allowing AI to experience the highs and the lows of decision-making in simulation and learning from it is the next step. DRL algorithms learn by maximizing future rewards. This allows AI to make decisions that seem unsatisfying in the short term but win significant gains down the road. Experts do the same thing when they make high-stakes operational decisions in their business.

- Learning strategy through practice
  Even single decisions to control or optimize processes can be difficult. And with competing optimization goals that dictate different strategies to manage the decision-making under various scenarios - and codifying how to play objectives against each other – it becomes almost impossible. But, AI can learn strategy through practice.

  Forward-thinking companies like SCG are building modular AI that explicitly teaches strategies that experts have taken decades of experience to master. Using the Project Bonsai low-code AI development platform, their chemical engineers themselves designed and built autonomous AI

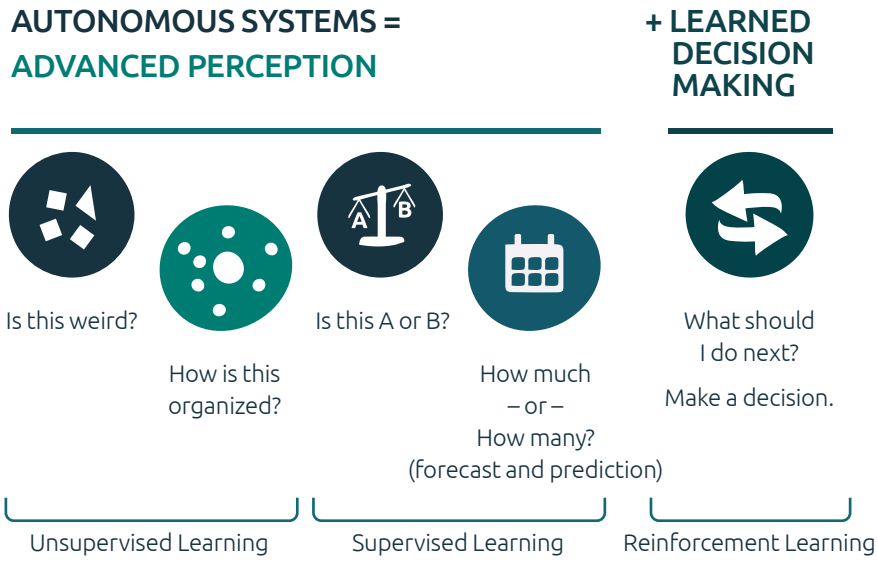
for their processes based on their expertise.

Making AI specific and real

A general, all-knowing AI will be science fiction for a long time to come. It is much better to focus on designing and building AI systems that succeed at specific, high-value tasks. When experts optimize their business processes, they do not leverage the complete human cognitive capability spectrum.

Instead, they direct the mentioned three cognitive abilities into specific tasks in controlled environments. AI can do precisely the same. To generate similar value - whether advising the less experienced or freeing up experts for even higher value tasks – it needs to deliver identical, specific intelligence.

It all boils down to this...



High-quality expertise is a scarce resource. Many companies aim to 'download' their organization's best expertise into AI systems that can advise, upskill and level up their workforce. And when these systems become autonomous, they can even act on their behalf. With low-code AI development platforms such as Project Bonsai, this is now not only within the realm of highly specialized data scientists. It is actually in the hands of business experts.

#machineteaching #autonomousystems #artificialintelligence #innovation #machinelearning

INNOVATION TAKEAWAYS

All by myself

Autonomous systems combine advanced perception, learning-based decision-making, and automated execution. Apply them to processes that require perception, forward-thinking, and strategy.

Be applied for success

AI is not science fiction, nor is it an all-knowing super brain. Nonetheless, organizations that focus on specific, task-oriented applications will reap early benefits.

Business tool

Business experts can now be involved in advanced AI design and execution. Autonomous AI can upskill experts as teachers, and others can learn from it. Low-code AI development tools such as Project Bonsai enable scaling across the organization.