

Using AI-Powered Interaction Analytics to Transform the Enterprise

Introduction: A future powered by machine learning

Speech recognition is not a new technology. It began in the 1950s with a primitive computer, referred to as Audrey by its creators at [Bell Laboratories](#). This primitive machine only possessed the ability to recognize the digits from one to nine, but it could identify the voiceprint from nearly any speaker if it was adapted to its subject beforehand.

At the time, it appeared that an era of intelligent voice-activated computers was just around the corner.

Machine learning has always appeared thus. From its very inception, computers have outstripped humans in tasks, such as performing complex math, which are suited to their design. When it comes to performing tasks that humans are well-adapted to, such as hearing and reading, the state-of-the-art has never advanced quickly. The idea of computer vision, for example, was once famously thought to be soluble by a group of graduate students [in a single summer](#). As we all know, that did not happen.

The era of human-machine interaction has been taking baby steps for decades—but now it has started to run. What's changed? Computer scientists have evolved new software tools, such as phonetic search aided by neural nets, which finally produce an accurate mirror of the way human brains operate. What's more, the massive data centers necessary to support this software have become essentially commoditized, available for rent to the smallest business.

Powered by these recent advances, human-machine interaction will now transform the lives of both businesses and consumers. Businesses will be able to use the massive power of distributed processing to understand their consumers like never before, increase their sales effectiveness, and deliver a tailored experience that will guarantee unprecedented customer loyalty.

Unpacking the Technological Wonder of Neural Nets

It is difficult to overstate the difficulty of biomimicry. This philosophy—inducing mechanical or software systems to replicate structures found in nature—has been known to produce interesting advancements. For example, one of the most well-known examples of biomimicry in design has resulted in a product that many people wear every day. The inspiration for Velcro fasteners was the hooked structure of the burdock seed. When the inventor, [George de Mestral](#), found the burrs sticking to his clothes after a hike in the Swiss Alps, he stumbled on an innovation that changed the textile industry.

The success of technologies like speech and text recognition depends on biomimicry, but in this case the structures being modeled aren't seeds—they're brains. Human brains aren't closely analogized to computers as they currently exist.

Instead, each neuron in a human brain is like a distinct computer, albeit limited. These neurons perform separate computing tasks that, when added together, create the structures of consciousness.

The distinct advantage of neural networks, as opposed to traditional computing, is that neural networks can solve problems where the methods for finding a solution are not known. In other words, we no longer program computers to do something; we program them to learn how to do something.

Traditional computers rely on top-down algorithms that contain instructions on how to perform operations. In simple terms, this means that traditional computers do not possess the capability to learn. The more neural nets can process a given data

set, however, the better they get at solving problems. Eventually, a well-designed neural network can exceed human abilities within a given narrow set of tasks.

For example, Google has used a [deep learning neural network](#) to improve its search results—and it was already far better at sorting through large collections of data than any human, or even any group of humans. Eventually, neural nets will be better at [driving cars](#) than humans. The average human checks their surroundings less than once a second, whereas neural nets can check their surroundings in every single direction several thousand times a second. Neural nets have been able to beat human champions in the ancient game of [Go](#)—and soon, neural nets will exceed human abilities in the field of voice recognition.

Using Neural Networks for Speech Recognition

Enterprises generate a vast amount of information in the form of audio. There are meetings between members of the company, calls to customer contact centers, cold calls from sales professionals to their prospects—terabytes of information in all. Functionally, this information is impossible for humans to parse. Individuals may be able to get data from a random sampling of recorded conversations, but it would be impossible for them to evaluate this body of data as a whole.

This is a job for neural networks. Almost like the Google search engine, a neural net scans a giant menu of recorded information—human voices. It searches the individual phonemes and uses these to recognize words, from which it derives an approximate understanding of

what the people in that recording are saying, and why they are saying it.

Again, a neural net becomes more accurate the more data that is used to train it. With terabytes of customer experience recordings, a neural net can be trained to recognize words and derive their meanings with unprecedented accuracy. Companies can use this analysis to understand how their customers feel about their company when they call. They can pick out trends in customer issues that may have been missed, and understand how their users are interpreting their marketing message. On the backend, they can optimize computing resources, make use of GPU processing, and more.

Why is AI-Powered Speech Recognition Important to Businesses?

Large-scale voice recognition and analysis can literally transform the way that companies do business. Once customer interactions are turned into data, the enterprise will gain unparalleled insight from its target markets. The enterprise will be able to react to these insights with all due haste—completing a metamorphosis into an agile, customer-focused entity.

Here are just a few of the positive outcomes that businesses can realize, based on large-scale Customer Experience Analytics (CXA) powered by neural nets.

- **Increased sales effectiveness:** Most sales are still done by phone. Voice analysis allows businesses to identify top-performing sales staff and understand how the sales message resonates with consumers.
- **Churn:** Companies need to understand the reasoning behind why their customers abandon a business. With CXA, they don't just get the reasoning; they can also understand the warning signs—as well as how to stem their losses.
- **Cost management:** How long do support staff take to handle each customer, and how many of them can resolve an issue during the first call? Measuring these statistics can allow companies to reduce call volume by resolving systemic issues.
- **Compliance:** There is now a raft of regulations in the United States and across the world that forces companies to identify and resolve customer complaints in a short amount of time. CXA will quickly flag these complaints for resolution.
- **CSAT & Loyalty:** CXA provides a path for companies to learn how their marketing message impacts their customer base. Are customers generally happy when they communicate with a business? Do they believe that the business is loyal to them and responsive to their needs? Knowing this gives companies a way to refine their messaging.

These outcomes sound like wizardry, but they're powered by understandable technology. Business analysis requires both narrative analysis and quantitative analysis. In simpler terms, this kind of CXA needs to understand both the stories ("This customer is angry because...") and the facts ("The calls where the customer disputed the first bill took four minutes and twenty-seven seconds.") The glue between them is the analytical framework.

Voice analytics can draw conclusions from the content of calls based on a multi-level understanding of their content. One component might file a customer interaction under a given topic. Another will connect that interaction to similar discussions in the same timeframe. Together, those two components can identify emerging topics and point to decisions that need to be made at the business level.

NICE

In order for businesses to derive understanding from customer experience analytics, it needs to work correctly. The worst kind of customer experience analytics only confirms things that businesses already know, or delivers results that business owners can't make use of. Getting the right results from CXA essentially requires a technologically unique approach.

Neural phonetic speech analytics represents the most powerful technological engine for voice recognition and analysis. Resulting directly from Nexidia's core speech processing and linguistic research, Neural phonetic speech analytics unifies speech recognition and phonetic indexing/search into a single, powerful engine. This engine creates a topic definition language that allows the business to quantify events and behaviors in very specific manner with high degrees of both precision and recall.

The Nexidia Analytics provides a technologically unique approach to make this possible.

Finally, for customer experience analytics powered by machine learning to work as intended, information can't be kept in silos. The Nexidia platform can process all customer interactions in a single system in order to drive the benefits across the enterprise. Alternative approaches, such as sampling, fail to achieve results, such as churn mitigation, at the customer level. The Nexidia approach scales to get all interactions in a single place. In addition, this single source of the truth allows for compliance and/or complaint management programs to specify a single set of rules for all interactions. Compliance and complaint management can now be consistent enterprise-wide.

NICE is the market leader, with almost fifty percent of market share in interaction analytics. With Nexidia's technology and applications, NICE now give enterprises the power to use the tools and technology previously available only to massive software enterprises. AI-powered speech and text recognition optimizes the way enterprises interact with their customers, uncovering hidden discontents, and suggesting unforeseen remedies.