Star Trek, here we come

Local startup is changing way we interact with computers

When my daughter speaks to Siri on the family iPad, I can't help but think about how what were just futuristic visions in my youth are reality today. Growing up in the 1980s, I could watch Michael Knight talk to KITT, his autonomous Pontiac Trans-Am, on a smartwatch on "Knight Rider." The crew of the USS Enterprise spoke to the ship's computer to research solutions to their current mission on "Star Trek."

Today, I searched Google using my voice to find out what year "Star Trek IV: The Voyage Home" came out in theatres. It was 1986 – but Google reads IV as "eye vee" instead of four. Roman numerals are hard.

One of the more memorable scenes from that film is where the Enterprise's chief engineer, Mr. Scott, tries to use a 1980s personal computer at an engineering company. He first tries to speak to the computer as if it were from the 24th century. When the computer does nothing, cranky Dr. McCoy suggests using the computer's mouse. Mr. Scott picks up the mouse and tries speaking through it – to no avail. The frustrated engineering company manager hastily suggests that Mr. Scott use the keyboard, to which Mr. Scott replies, "How quaint."

Interfacing with our technology has come a long way since the 1980s. We're able to communicate with our computers, cars, watches and smartphones by speaking to them.

On our phones, Apple's Siri and Google Assistant help us make restaurant reservations or return a text. At home, devices enabled by Google Assistant and Amazon Alexa are simplifying our smart homes and making controlling everything easier, from your home theatre and audio system to lights and thermostats.

These interactions can seem almost

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magical. Magical that is, until your car doesn't understand what address you're saying and you end up pulling over to the side of the road to manually enter the address into your phone's GPS.

We're not at the Star Trek level of voice interaction yet, but local startup Maluuba is working to help us get there. Founded in 2011, Maluuba was acquired in January by Microsoft.

Maluuba builds artificially intelligent systems that understand human language. What does that mean for the average consumer? They're developing technology to make computers literate. Think back to grade school and all of those standardized tests that we took. Those tests challenged our ability to understand the context behind what we were reading.

Maluuba has worked on the kinds of interactions that are found in Siri or Alexa. These "dialog systems" are composed of a short sequence of steps to help you accomplish a task. Amazon Alexa is great at helping you find music you want to play or to order something from Amazon. Apple's Siri allows you to interact hands-free with your iPhone or iPad to reply to messages or set an alarm.

Maluuba is building a next generation of dialog systems that are more akin to interacting with a travel agent. You are able to compare different packages – even switching back and forth between different options – while the virtual agent explains things to you.

"These are dialog systems that help you achieve a goal even when you might not know what you want," says Adam Trischle, senior research scientist at Maluuba. "It's upping the ante to more complex goals."

Maluuba works on getting machines to understand language, but that doesn't necessarily mean voice. Their work focuses on understanding the text of a conversation. This means their technology can be used to make the chatbot interactions in Facebook, Slack or Kik better than what you see today.

"We really like text," says Trischle. "Talking to your phone can be weird and awkward when you're surrounded by people."

The systems that Maluuba develops can be used with voice or by typing. As an example, the virtual agent might help you find something you don't know you're looking for.

"You ask for a cheap package for Hawaii and there's nothing available because Hawaii is expensive, so the system suggests Costa Rica is similar and it meets your budget," adds Trischle.

If you want to impress your friends at a barbecue this summer, the two terms you need to know are artificial intelligence and machine learning. They're often used interchangeably, but this is incorrect.

Artificial intelligence is a field that started in the 1960s. "The research into artificial intelligence was very ambitious and very grandiose," says Trischle. "They wanted to get computers to really think in a human sense."

These researchers focused on creating general intelligence that mimicked human beings. It was a massive task and there were multiple barriers the researchers couldn't overcome at the time. Artificial intelligence research went into a kind of hibernation.

The researchers who stuck around took a new tack. Rather than trying to get the machines to think like humans, they focused on building systems that could learn from data to accomplish simple, specific tasks. This new field is called machine learning.

"We don't care if they look or act like the brain, we just want to solve some real world, simple problems," notes Trischle.

"Autonomous vehicles, voice interaction ... those advances have happened because the tasks are very constrained," adds Paul Gray, director of product marketing at Maluuba.

What's driving this trend? It's a combination of data and hardware. First, we have an almost unfathomable amount of data available to researchers. "We have almost 20 years of Internet data and people are connected all the time," says Gray.

Second, computers – from laptops to smartphones – are more powerful.

Going back to those not-so magical-interactions, I wanted to know if it was something I was doing wrong.

"Most of these current systems have a problem with expectation versus reality," says Trischle. "They're good for the interactions they've been built for – Alexa for music and Siri for travel."

"This year will be the breakthrough for language, getting it to the level we've seen for vision and speech," adds Gray.

Imagine being able to ask your virtual assistant to find flights for a trip to Brazil. When the results are returned to you, you ask a second question about whether any vaccines are required. Your virtual assistant will understand the context of your question.

Instead of returning a few website suggestions as Siri would today, your virtual assistant will read the sites, determine the answer and tell you what you need to know. All of this while not forgeting that you're talking about a trip to Brazil. The goal is that you forget you're talking to a machine rather than a human being.

It'll only be a matter of time before my daughter will be able to tell Netflix to play her favourite show and it will know exactly what to put on. It will probably be something I don't want to watch. The more things change, the more they stay the same. Bring on the magic.

Alex Kinsella has been part of Waterloo Region's tech community since 2004 and is always looking for the next great gadget (or tacos, if it's Tuesday). Find him on Twitter at @alexkinsella