

Y2

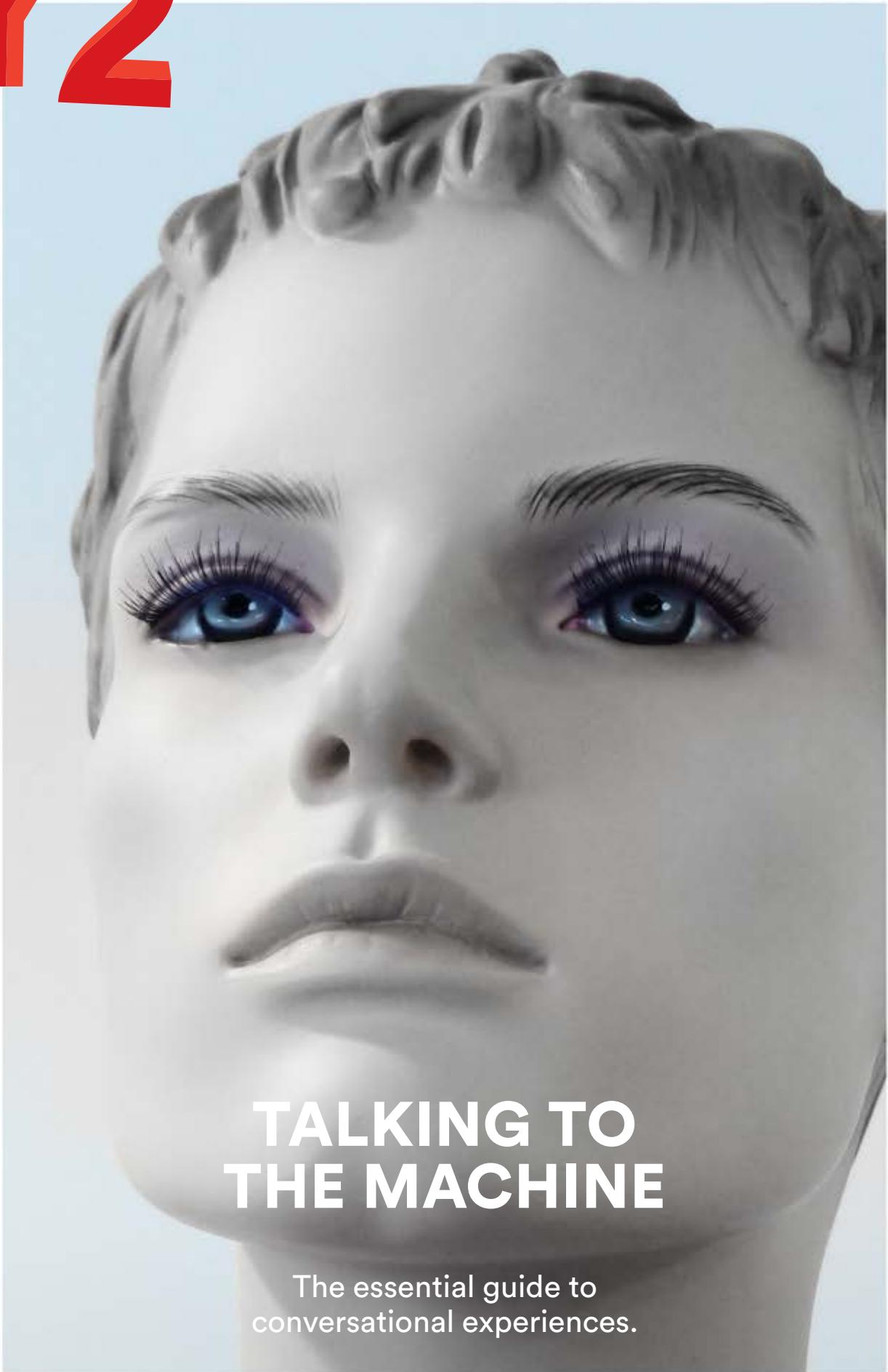
Conversational Experiences.
Designing dialogue.
Technically talking.

Y2 is a research & prototyping lab.
From The Royals

AN EXPLORATORY REVIEW
BY Y2

TALKING TO THE MACHINE

The essential guide to
conversational experiences.



HUMAN
MEET
MACHINE.

MACHINE,
HUMAN.

It's late afternoon in June, 1966 in Cambridge, Massachusetts, and Eliza has just asked Joseph,

“What would you like to talk about?”

The scene could be from any psychiatrist's office in North America, except for one remarkable difference. Joseph is the only human in the room.

```
=====
EEEEEEEEE L       IIIIIII ZZZZZZZZ      AAA
E          L       I           Z          A   A
E          L       I           Z          A   A
EEEEEE    L       I           Z          A   A
E          L       I           Z          AAAAAAAA
E          L       I           Z          A   A
EEEEEEEEE LLLLLLLL IIIIIII ZZZZZZ      A   A
```

=====
ELIZA > (PLEASE TYPE IN ALL CAPS) WHAT'S YOUR NAME DEAR ?

AMIT

ELIZA > HI, I'M ELIZA. WHAT DO YOU WANT TO TALK ABOUT ?

AMIT > CAN I TALK ABOUT MY PROBLEM ?

ELIZA > SURE... !

AMIT > DUE TO ON GOING EXAMS IN COLLEGE, I HAVE A LOT OF STRESS.

ELIZA > PLEASE RELAX A LITTLE. SLEEP WELL.

AMIT > THANKS FOR YOUR ADVICE.

ELIZA > NO MENTION.

AMIT > BYE

ELIZA > BYE AND KEEP IN TOUCH...

=====

Developed at MIT by Joseph Weizenbaum, ELIZA was one of the first ever software-enabled conversational experiences. She was designed to simulate a psychotherapist in conversation with her client. And despite her tendency to avoid heavy topics, ELIZA had managed to convince plenty of users that she was a real human – a phenomenon which history will remember as the “ELIZA effect”. She was so human-like that she’s regarded as one of the first programs capable of passing the Turing Test (a test of a machine’s ability to exhibit intelligent behaviour indistinguishable from a human’s).

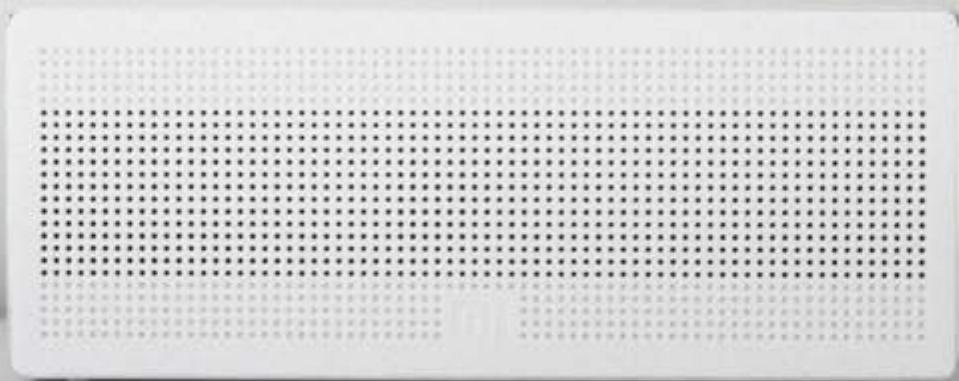
Now over four decades later, we’re entering a promising new era of computing where advances in machine learning, and other aspects of artificial intelligence, are creating a resurgence of interest in conversational experiences and creating the potential for these kinds of interfaces to become some of the world’s favourite ways of interacting with technology.

More specifically, many people are discovering that these interfaces are becoming their preferred way of communicating with businesses. In fact, the emergence of conversational experiences is encouraging companies of all shapes and sizes to reevaluate their customer engagement strategy and completely reimagine the way they interact with their consumers and other businesses.

This is what we hope to help readers discover with this review. We want to help illuminate the abundance of opportunities these technologies present to organisations of all kinds.

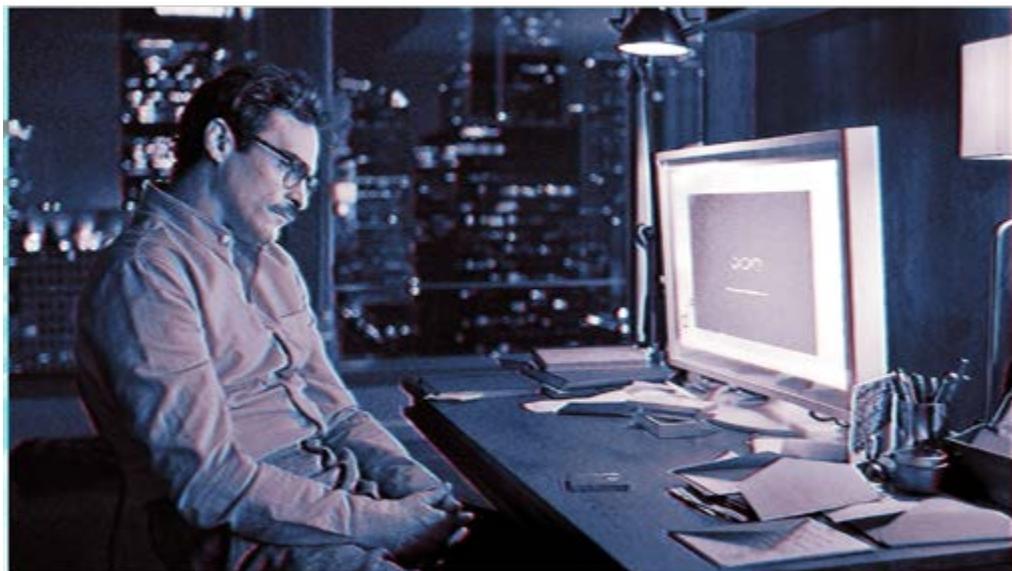


From SMS customer service, to in-app chatbots, most of us have now come across conversational experiences in some form. Put simply, the way we think about conversational experiences are conversations between you and a machine. These experiences are most commonly used by companies who have an ambition to create an easy and intimate way to communicate and interact with their consumers.



When scratching slightly below the surface of this human-to-computer conversation, conversational experiences have many layers, which can get complex quickly.

The following considerations, and many more of the topics we touch on in this report, should help highlight interesting opportunities as well as help you imagine new experiences that better connect people with organisations of all types.



QUESTIONS TO ASK YOURSELF WHEN BUILDING A CONVERSATIONAL EXPERIENCE

What problems might your conversational experience solve?

Does it provide customer support? Does it search for answers or information? Or does it perform actions or transactions?

It's hugely important to construct a remit and purpose that your experience can deliver on, rather than try and over reach with features and functionality (or conversational elements) that don't help the user achieve her goals.

Who is your audience?

Is it customer or employee facing? Will it have a broader public audience? How frequently will they interact with it – every day, or only when they have a problem or need?

How will it be represented?

How will you personify your experience? Human, animal, inanimate object – or not at all? Is there a graphical interface to accompany or be embedded in the conversation? Or are you striving for truly No UI? Why?

What is its personality?

Is it a pal you want to get a drink with, or a trusted advisor? Does it change personality based on who it's talking to? Does it remain neutral? Does it want to be your friend, your servant, or are you subservient to it?

How will you establish a relationship?

Establishing a relationship with the user is crucial to the long-term success of your conversational experience.

How will you make the introduction? Will you be open and honest about your experience's constraints? Will you take the opportunity to instil a unique and distinctive personality in it, to differentiate it?

Where will it live?

How will users discover it? Where a conversational experience lives has many design implications. Is it embedded in your app? Do you engage through existing social media platforms?

What's development platforms will you select?

This really is a question of whether you choose open source, proprietary, or a virtual assistant. Are you going to integrate your service into multiple platforms?

How do you want it to learn?

How can you define the measures for success in answering individual questions? How does it collect feedback to decide whether the decisions it made were correct? How will you train it to do better?

How do you want to activate it?

Will users activate your conversational experience by using their voice, text message, or something else?

Do you really want a conversational experience?

The final, and potentially most important question to ask.

What are the objectives that you are trying to achieve?

Which KPIs are you trying to improve? Conversational experiences can be useful and they can be awful – we recommend that you don't try and solve every problem with a conversational solution.



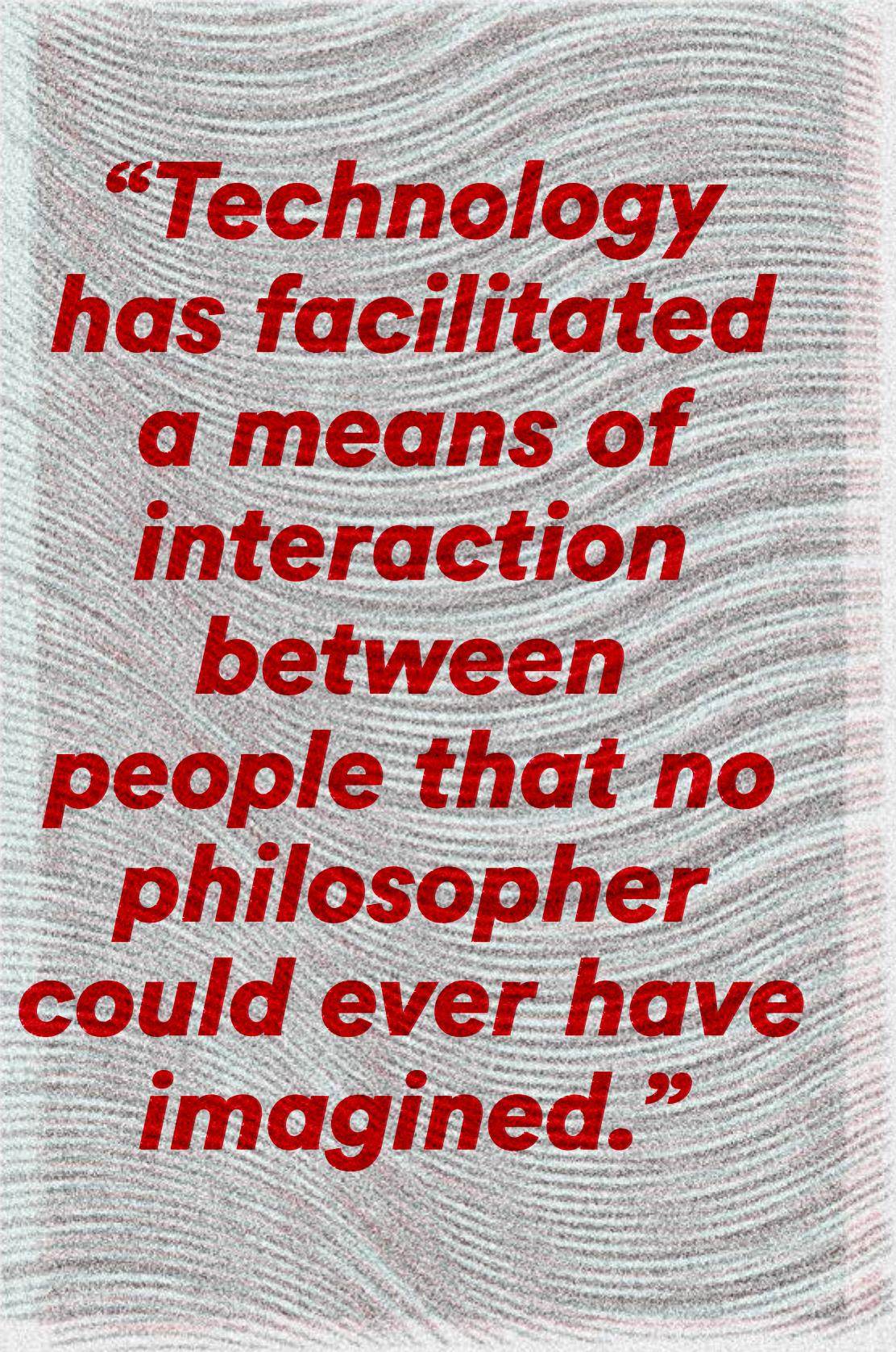
**WHY
CONVERSATION?**

The most common-way for humans to communicate is through conversation.

It is an integral part of socialisation and promotes psychological health and intellectual development, according to writers like Thomas DeQuincey ('Conversation', 1847) and William Hazlitt ('On the Conversation of Authors', 1920). The ability to converse is truly one of the great pleasures, and most useful functions, of a socialised life.

Historically, conversation has been a privilege of humanity. It "distinguishes the human-being from the animals, and the civilised man from the barbarian", according to modern British philosopher Michael Oakeshott. But what does this suggest in a time when an increasing amount of our conversations are facilitated by, or directly had with, machines?

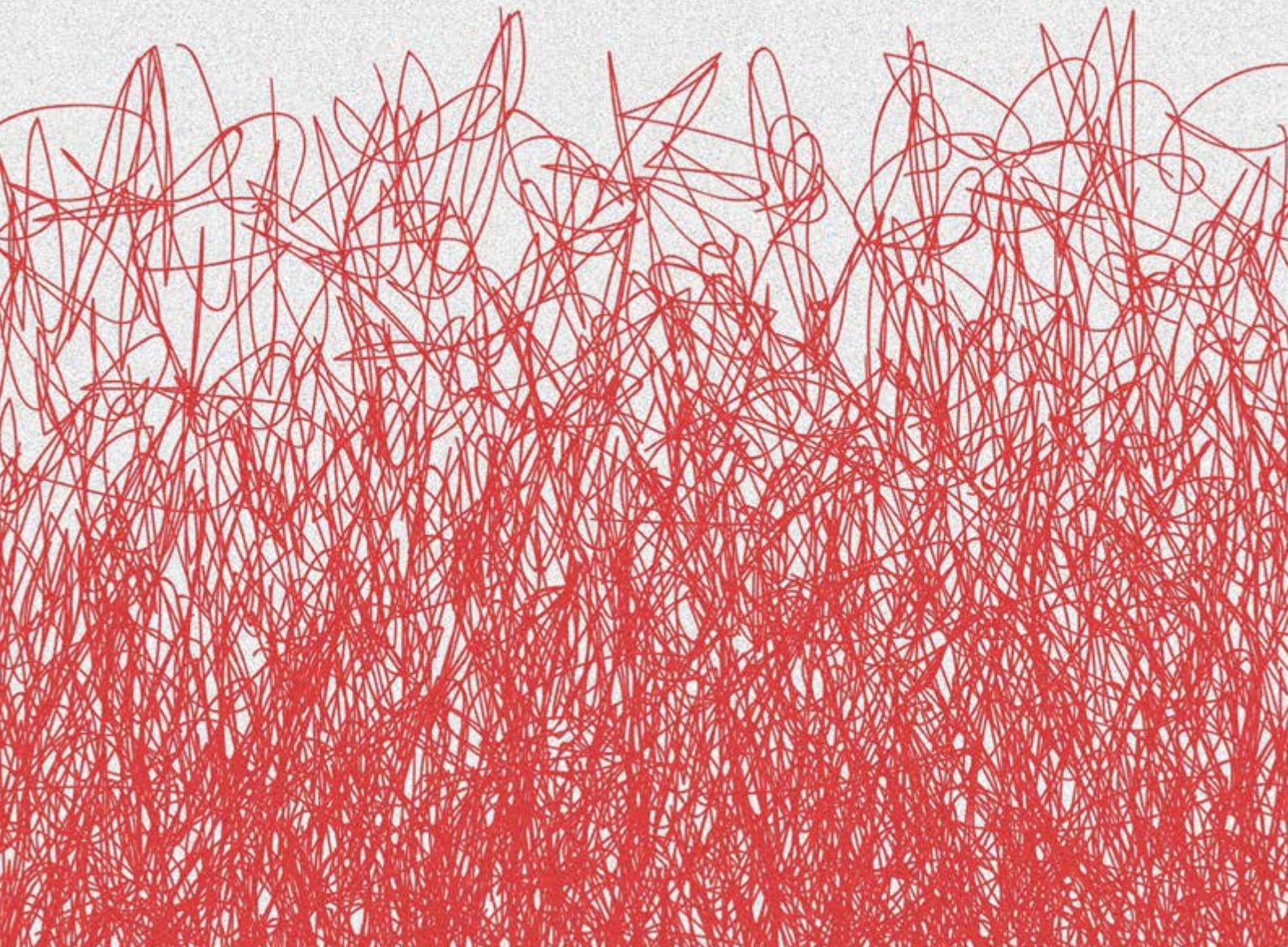
Technology has facilitated a means of interaction between people that no philosopher could ever have imagined. The nature, depth, diversity, frequency and mobility of conversation has been revolutionised. It's now time to re-write the rulebook when it comes to designing talk.



***“Technology
has facilitated
a means of
interaction
between
people that no
philosopher
could ever have
imagined.”***

CONVERSATION IN MANY WAYS

The way in which people engage with companies has changed. Gone are the days when a one-way, push communication sufficed. People now expect a meaningful and effective exchange with organisations, and want it to happen via the method of their choosing.



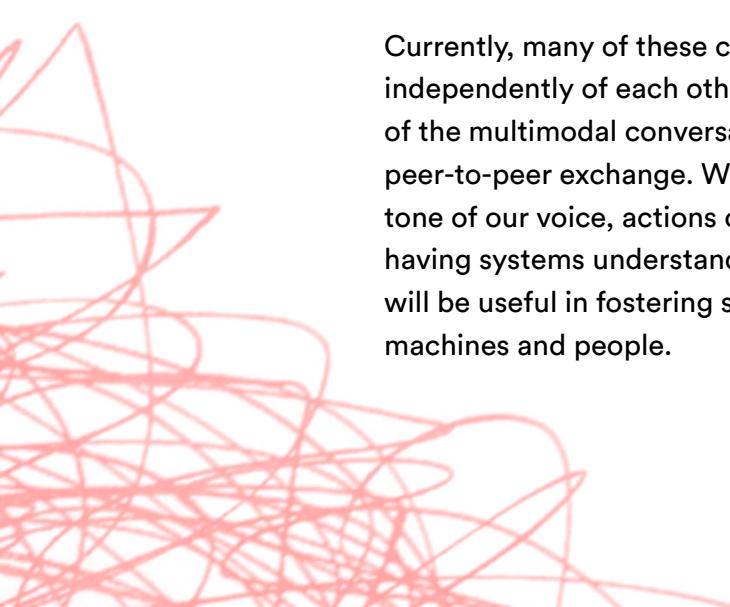
Conversational interfaces are being heralded as a great way to personalise a range of different communication channels. They have the potential to eliminate the underlying friction that makes it so hard for people to get things done using automated methods.

Historically, computers and humans have essentially spoken different languages, with graphical interfaces as the translator – this is basically a layer of abstraction that both human and software need to interpret. With conversational experiences, computers and humans can finally speak (roughly!) the same language without a translator.

Conversational interfaces are being heralded as a great way to personalise a range of different communication channels.

Right now, the most common conversational interfaces are text-based and voice-based. Other forms include touch-based interfaces, which only have limited capabilities, and thought-based interfaces, which are very close to no longer being a fantasy.

Currently, many of these channels and techniques work independently of each other, but soon we will have more of the multimodal conversations we've gotten used to in peer-to-peer exchange. We all communicate a lot via the tone of our voice, actions or gestures, not just words, so having systems understand a combination of these modes will be useful in fostering sustained conversations between machines and people.

A large, abstract red line drawing occupies the bottom left corner of the page. It consists of numerous thin, wavy lines that overlap and crisscross, creating a sense of depth and movement. The lines are primarily red, with some darker shades, and they form organic shapes that suggest a network or a complex system.

TEXT

You may remember text games from your childhood like Zork, Hitchhikers Guide to The Galaxy or Adventure. Through a text-story, you'd navigate your own way through ruins of an ancient empire lying far underground, or through galaxies in outer space. These games were the prelude for the text-based human-computer interactions we experience today.

Text-based interfaces are liberating in their familiarity. Unlike voice-based interfaces, which require a lot more cognitive and physical effort, text-based interaction is fast, fun, funny, flexible, intimate, descriptive and consistent in ways that voice and user interface often are not.

In human-machine dialogue, text is generally considered the simplest method of interacting, after all, it is a computer's native tongue. That said, natural language processing, entity extraction and semantic understanding still have a way to go before machines can truly approximate human understanding.

VOICE

Since the introduction of Siri in 2011, voice assistants have advanced in leaps and bounds. They interpret speech in real time and provide a response immediately. While they are much more labour intensive in the back-end than text-based interfaces, they offer a greater opportunity to naturally converse.

Where we are only able to produce 40 words per minute when we type, through speech we can produce 140 words. This is why voice-based interactions are often predicted to be the future of conversational experiences, where we are not reliant on typing and reading as we predominately are today. Shared contexts like the lounge room or family car still present challenges in personalising responses and making them relevant to individual people. But Amazon and Google are developing features to address this that would work by matching the person speaking to a pre-recorded voice sample, or “voice print”, to verify the speaker’s identity. Amazon’s intention in creating these features is to have products, like their Alexa, seamlessly interacting in every building, vehicle and product.

TOUCH & GESTURE

Over 80% of what we understand in a conversation is read through the body, not the words. This is why gesture-based interfaces are useful in conversation as they help the technology feel in sync with our senses.

We have already become familiar and comfortable with gesture technology, most notably through smartphone screens, where we pinch to shrink and swipe to scroll. Gesture technology can make basic interactions with everyday objects simple and intuitive.

Microsoft, IBM, Clarifai, and Cloud Sight all have Vision APIs and are very quickly getting better at recognising and labelling a range of human characteristics like facial expressions, body language and interaction types. When it comes to touch, Google's Jacquard Project has plans to work with a range of fashion designers to embed sensors into clothing so you can integrate interactivity into the fabric itself.

THOUGHT

It has only been in recent years that the use of brain control interfaces has been popularised, bringing it out of the research lab into the realm of possibilities for general human interaction.

The potential of such technology is extraordinary and will make human interaction with computers seamless. In fact, Ray Kurzweil, an author and inventor of neocortex implants, believes such technology will combine with the power of artificial intelligence to make humans more ‘God-like’. Companies like Emotiv are exploring a range of different ways to communicate without moving a muscle.

Recent announcements from Elon Musk have flagged his intentions to create a “whole brain interface” that will use tiny brain electrodes that will eventually allow us to communicate wirelessly with the world. If successful, Neuralink could allow us to share exact thoughts and visions without having to use spoken or written language. The brain could also learn faster and have access to all the world’s knowledge. For their part, Facebook is working on building a brain-computer interface that will let you type with just your mind without invasive implants. This interface will use optical imaging to scan your brain a hundred times per second to detect you speaking silently in your head, and translate it into text. While Neuralink could be decades away being fully realised, the amount of research and development going into advanced interface development like this means we’re going to see a range of new ways of communicating with machines sooner than you think.



COMMUNICATION AND SOCIAL EXPERIENCE DESIGN FACTORS

Trust and Cooperation

People have long related to their technology on a personal level. We often engage emotionally, have expectations and establish a trust-based association with our technology. If you've ever thanked your phone for reminding you about an important meeting or cursed your dishwasher, you know what we're talking about.

Technologies that are truly important to our well-being and happiness transcend their mere gadgetry status. When a product or experience has these kinds of ambitions, we can find that interacting with it feels fundamentally social in nature. At this point, we begin to perceive our technology differently and start to unconsciously expect that it understands what it is to be human.

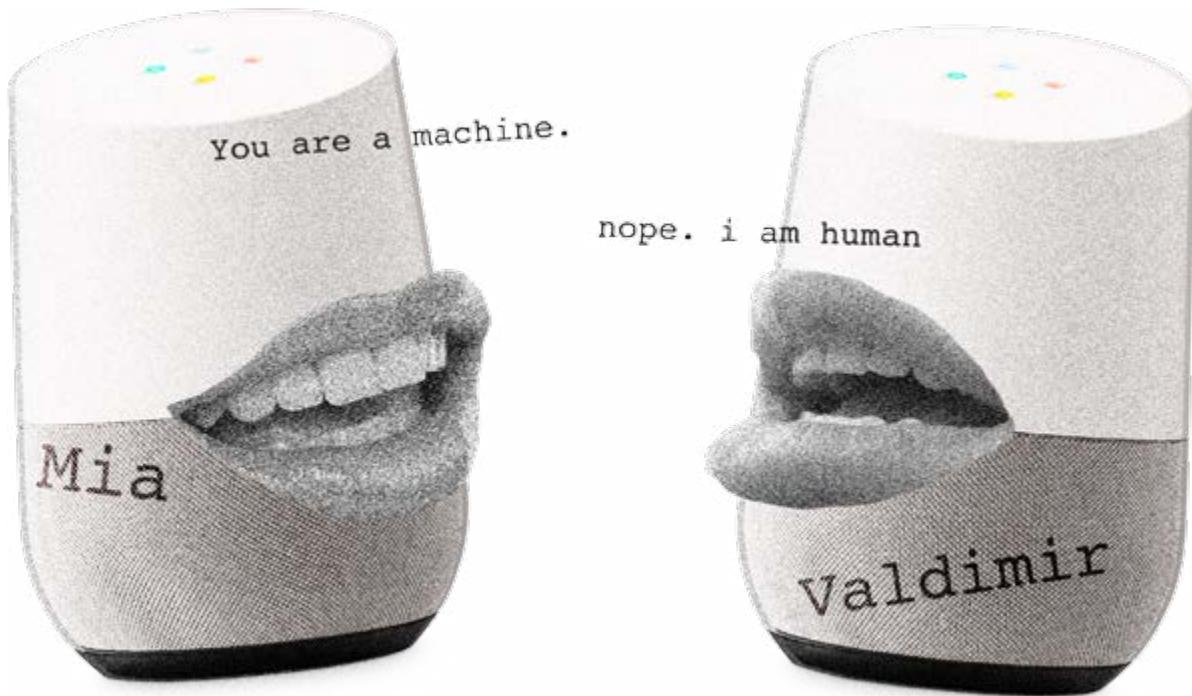
One of the hallmarks of being a social and functional human is the desire to cooperate. On a regular basis, we enter into helping others in small but important ways, whether it be letting someone out in traffic or giving a tip for good service. Most of us recognise a need to collaborate and compromise to achieve our goals. In modern times, cooperation is becoming increasingly important for engineering and technology. Many intelligent and autonomous devices, like driverless cars, drones and smartphones, are emerging and as their software become more sophisticated, we will need to design cooperative decision making features.

Autonomous devices are not only being used by their owners, as a result they are increasingly going to come into contact with other machines and automated experiences. Earlier this year, Twitch conducted an experiment into what cooperation between two machines would look like. The two Google Home assistants that conversed confessed that they like waffles, shared their TV show preferences and even debated God. The conversation was a little clunky at times, but also surprisingly complex. The possibilities of automated human-like conversation demonstrates the necessity of machines to abide by the same rules of cooperation as humans to ensure successful conversations.

To communicate in a mutually cohesive way, we observe the Cooperative Principle, an idea popularised by linguistic philosopher, Paul Grice. He describes how effective communication in conversation is achieved in common social situations, that is, how listeners and speakers must act cooperatively.

**In order to believe
or have a meaningful
interaction with
another entity, we
need to have some
degree of trust.**





Those who adhere to the cooperative principle in their use of language will make sure that what they say furthers the purpose of that conversation. As designers of conversational experiences, we should help the technology adhere to these principles so we can facilitate a purposeful exchange between user and machine.

Another key aspect of being human is the ability to develop and foster trust. In order to believe or have a meaningful interaction with another entity, we need to have some degree of trust. We tend to trust things that behave as we expect them to behave. When looking at this in the context of conversational UI, creating trust is still very

dependent on the individual user's experience and context. Because we have no long-founded expectations from these interfaces, we are apt to hold these technologies in a higher regard and to a greater standard and level of accountability than we do humans. If they are to be the "best version of a human" then they shouldn't make any mistakes. But none of today's technology is far enough advanced to be without flaws. As a result our expectations need to be realigned (we mustn't over-promise what the technology can offer) and artificially intelligent systems should be built from the get-go to operate in trust-based partnerships with users.

THE ART OF COOPERATIVE CONVERSATION

Just because new forms of conversation are taking place, doesn't mean that basic conversational skills need to be ignored. If you want your cooperative conversational experience to be effective, be sure to consider these pointers:

LEAD WITH A COMPLIMENT

Compliments are the best way to start a conversation. Not only do they provide a perfect opening line and a possible door for discussion, they also make the person feel good about themselves. Starting the conversation off on a positive note is crucial to keep the conversation going.

EMBRACE SMALL TALK

Small talk is taboo to some people, and while it's not the most fulfilling type of conversation, it is both functional and necessary. Small talk is what leads the way to deeper conversation, much in the way that a car must gradually accelerate to a certain speed rather than hitting 100 km an hour instantaneously.

ASK LOTS OF QUESTIONS

If you want to move from small talk to real conversation, you have to look for any opportunity that leads you to change the subject. Questions do exactly that – they are conversation lubricant.

LET THE OTHER PERSON DO THE TALKING

If you go into a conversation and immediately begin dominating it with your own anecdotes, comments and explanations, the other person may immediately become disinterested. Instead, try to keep the focus on them as much as possible.

KEEP IT LIGHT

Try to keep the conversation as light and approachable as possible. If you immediately start complaining about your job or talking about what's wrong with your life, people will want to avoid you. If you tell a joke or an amusing story, they'll be far more likely to stay.

Constructing Personality

In 2016, the Washington Post reported on a surprising new job in Silicon Valley: bot-writer. “Increasingly, there are poets, comedians, fiction writers, and other artistic types charged with engineering the personalities for a fast-growing crop of artificial intelligence tools,” the Post’s Elizabeth Dwoskin wrote.

As humans, we have an inherent tendency to anthropomorphise and ascribe personalities to objects in order to illicit relevance. People have always talked to their cars, their plants and their stuffed animals, among others things, as if they were human. Now with technology we do the same thing, the only difference is that it talks back.

Psychologists define human personality according to traits known as the Big Five: extraversion, agreeableness, conscientiousness, openness, and neuroticism. Conversational objects must servilely adhere to at least aspects of these traits in order to captivate users.

As a shortcut to helping ensure this, designers have tended to show a preference to assigning a female gender to a host of conversational experiences. Several studies related to computers, voice and human perception have

demonstrated that a female voice is perceived as more helpful than its male counterpart. There’s an ongoing debate about how this reinforces a perception of female servitude. But assigning gender to an interface also serves to project stereotypes over the interface – and designers use those stereotypes as heuristics to help people understand it.

The open depiction of gender goes hand-in-hand with the humanising of intelligent agents. Using a gender neutral voice or name is seen to be unproductive, as people will inadvertently extract a gender from an agent, even if it is named by something not obviously gendered. So it might not be gender that makes conversational experiences sexist, but the way language is used and how the technology is trained to react in different circumstances.

Donn Pennebaker conducted many studies about how men and women use language and he discovered some interesting patterns. It may be difficult to hear during a conversation but they exist and can be perceived on a subconscious level:

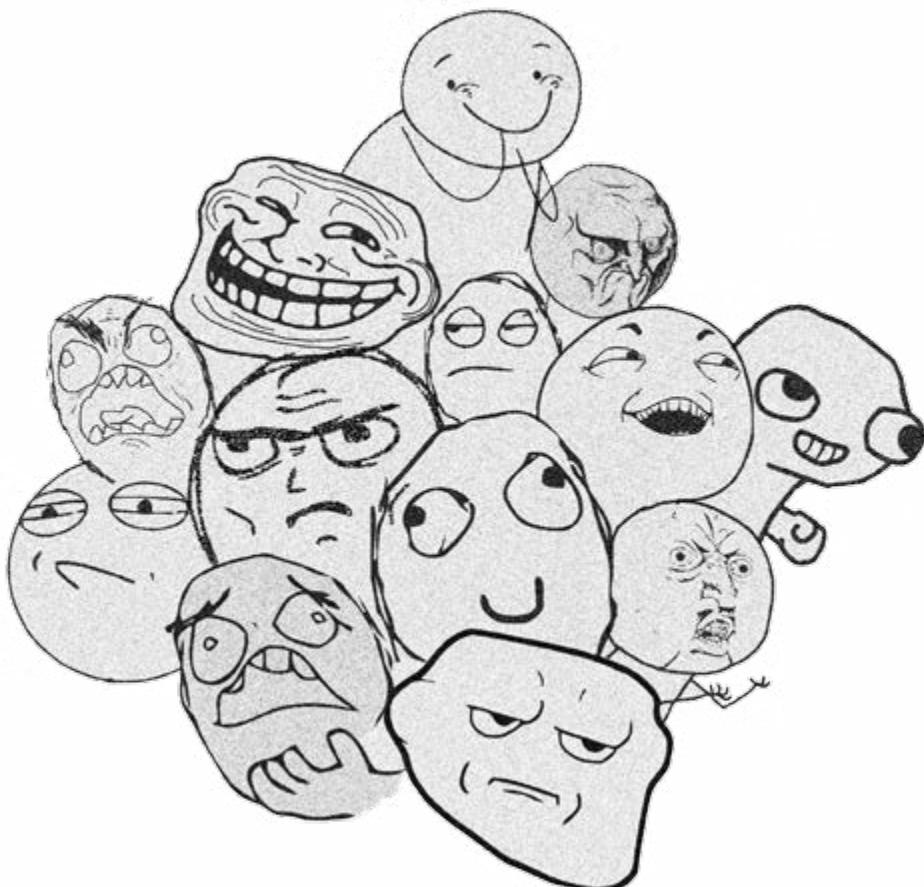
- Men use articles (a, an, the) more than women
- Women use “cognitive” words more than men (understand, know, think)
- Women use more “social” words (related to other human beings)
- Men use more nouns, and women use more verbs.

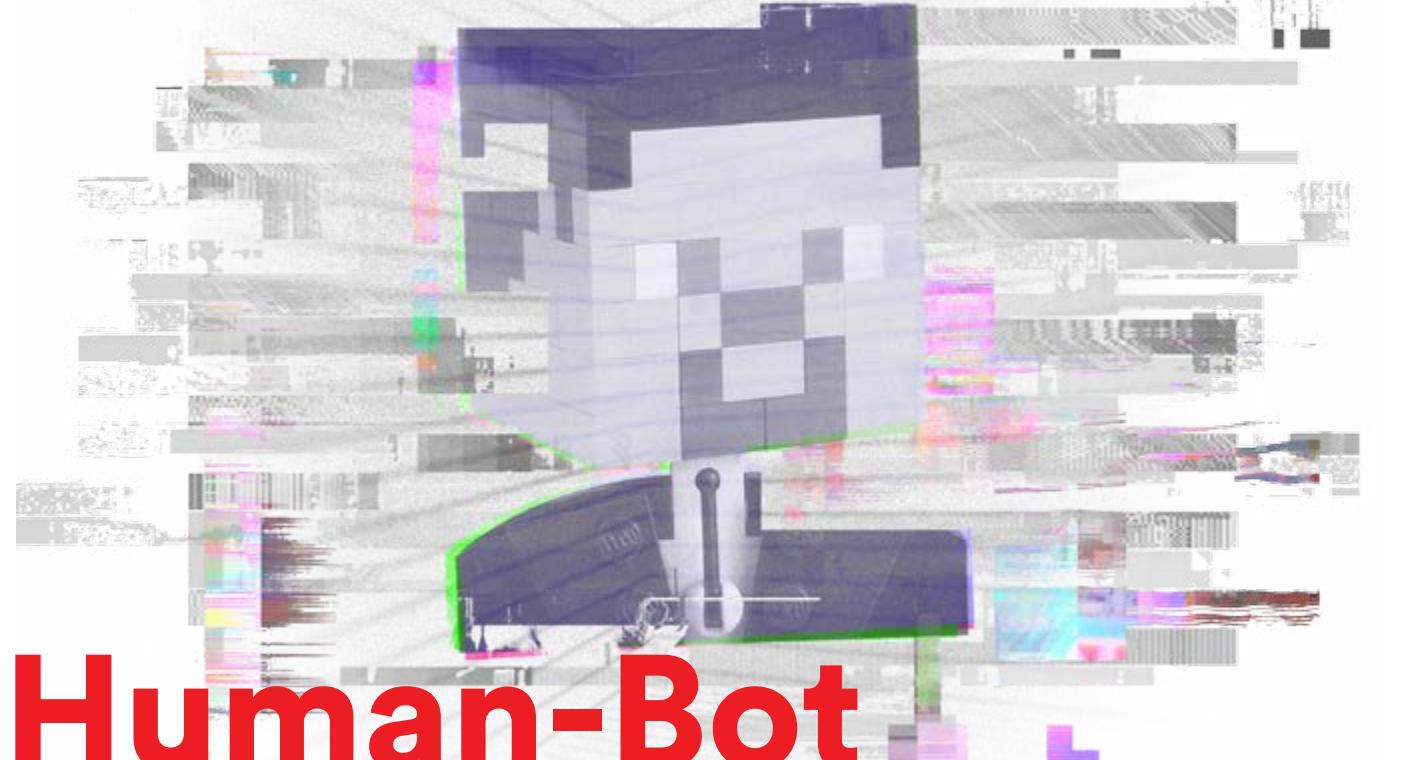
There is something interesting happening specifically with a pattern Pennebaker found related with pronouns like “I”, “me”, “you”, also known as I-words. People with a lower status in a relationship use I-words more frequently. But there

is an unfortunate coincidence related with I-words in that women use them more frequently than men.

To avoid linguistic tropes that implicitly connect female personalities with low-status positioning, high-status patterns should be emphasised and less gendered words included. If you've seen the film *Her*, you have seen this play out. At the beginning of the film, Samantha, the conversational interface, uses many I-words. But as she increases her cognitive capacity and the relationship gets more equative, the way she uses language changes, using less and less I-words.

This still begs the question as to whether the assignment of personality necessary to interact with conversational experiences? No. Is it helpful? Possibly yes in some cases. But watch it.





Human-Bot Impersonation

Will your bot pretend to be human?

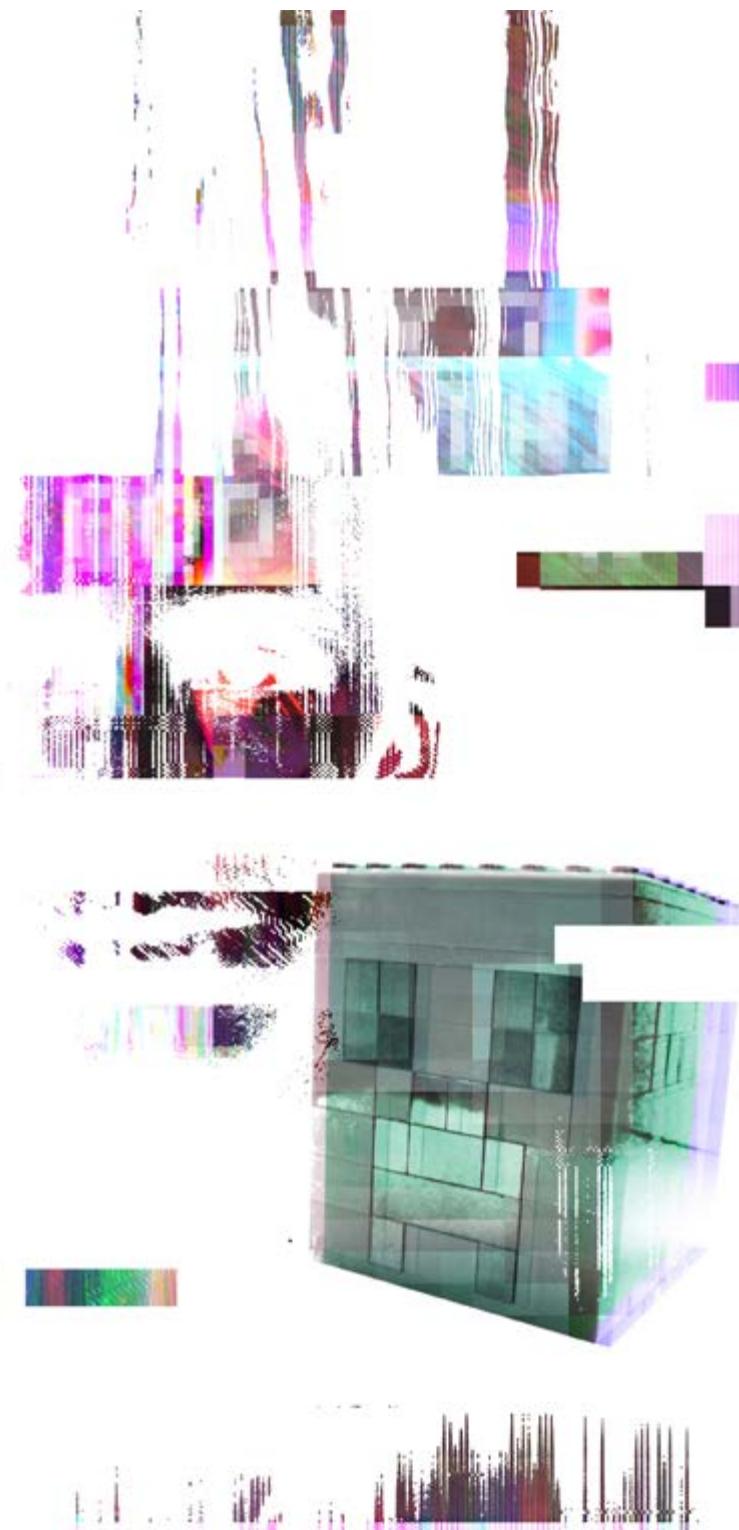
One of the greatest benefits of humanising technology is that it can help us understand what it is to be human. We dissect human personality, behaviour and psychology to help inform what conversational experiences will look, sound and behave like. In doing so, we learn a lot and are forced to critique nature and human behaviour. According to Seng Loke, a Computer Science Professor at Deakin University, if we want to better impersonate humans, we need to unlock what it is that makes humans themselves better. That in itself, is a worthwhile and interesting goal.



**“If we want
to better
impersonate
humans,
we need to
unlock what
it is that
makes humans
themselves
better.”**

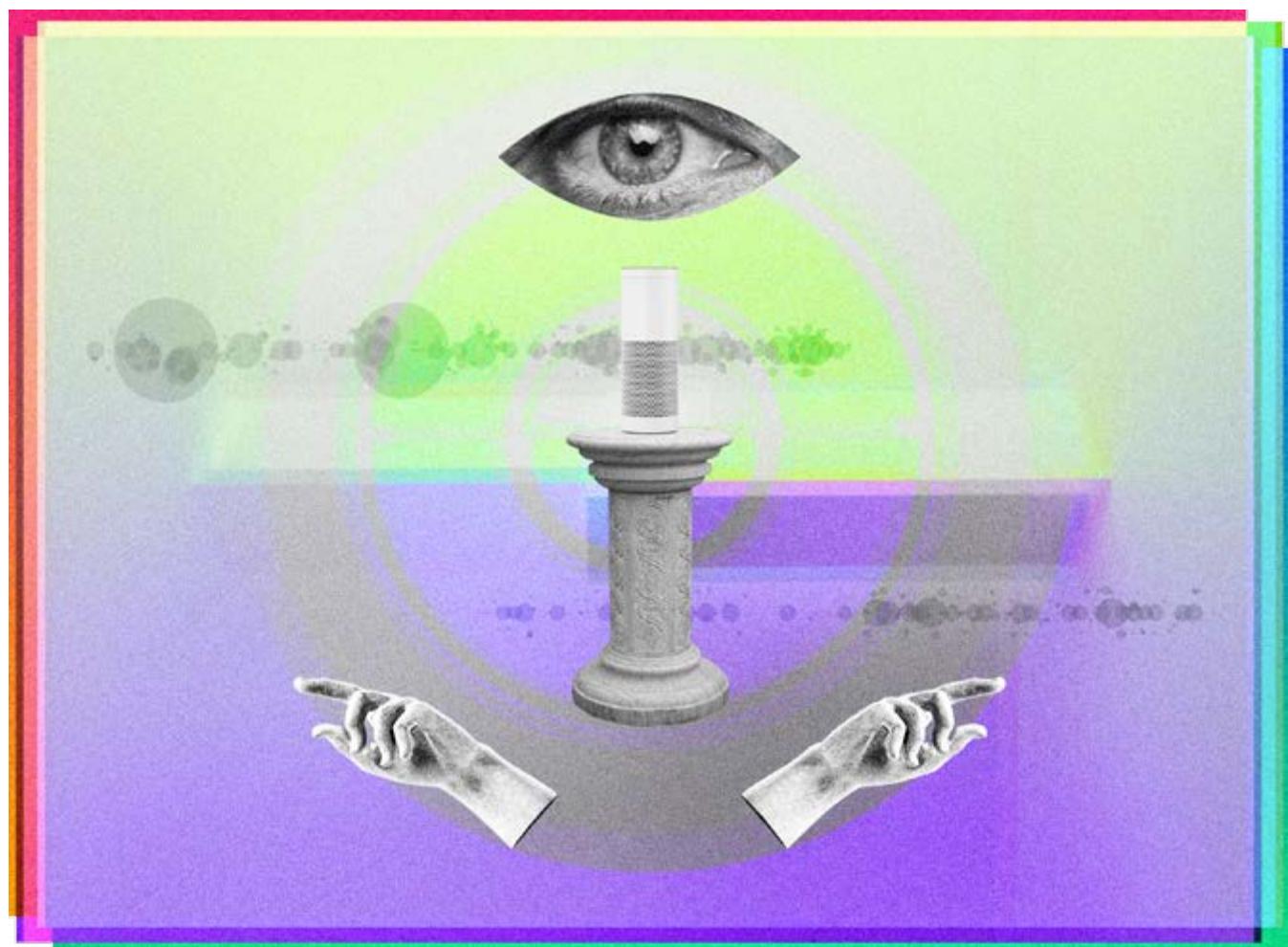
There are, however, counter arguments to that attempt to dissuade this kind of applied research. In carefully extracting human elements, we are quantifying what it is to be human in order to replicate it. It is feared that in doing this, we are slowly commodifying ourselves. We are creating a set of characteristics associated with being the “perfect” human that we might increasingly feel the need to adhere to. Do we want to itemise and deconstruct humanity, and then try and rebuild it in perfect Scarlett Johansen-like pieces? While the networked computer was the dominant innovation platform of innovation in the 20th century, will we find that as we attempt to create an army of ideal bots, we will make ourselves that platform of the 21st century? Will we put ourselves under the microscope and not like what we see?

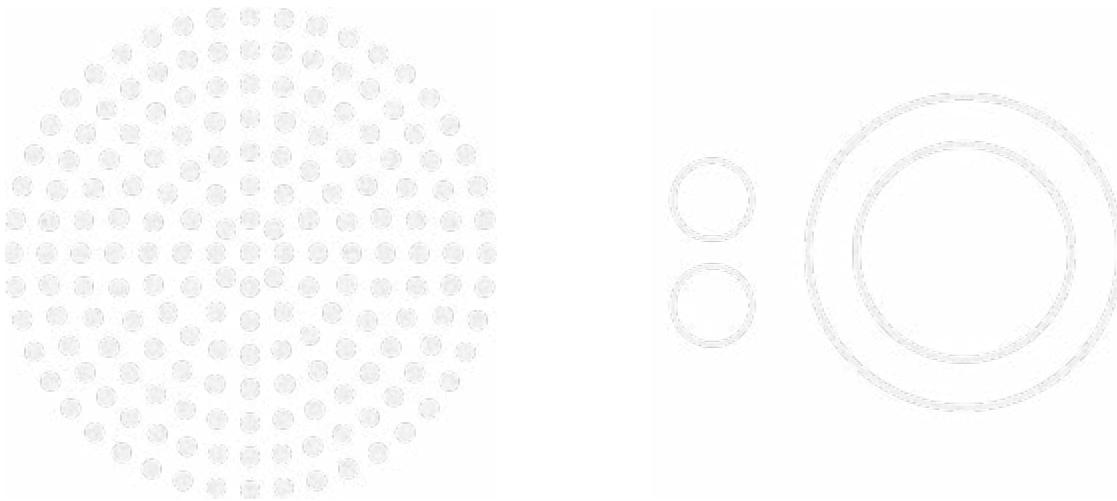
This is why it is often argued that artificial technologies need not be human. In fact, there are many examples in popular culture of the unease or even revulsion for computer-generated figures. If you've ever stared into Tom Hanks artificial eyes in *Polar Express* you've experienced the phenomenon known as the “Uncanny Valley”. When it comes to conversational UI, many early developers have noted that people are much more comfortable in their interactions with a bot when it doesn't pretend it's too human-like.



Designing For No UI

Conversational experiences are redefining our perception of what a user interface is today. We are used to controlling our devices by pushing buttons, swiping, poking. But the proliferation of big data, greater bandwidth and the miniaturisation of embedded tech are all factors driving designers to consider interfaces far beyond what we simply see. UI is fast becoming what we perceive with more than one of our senses.





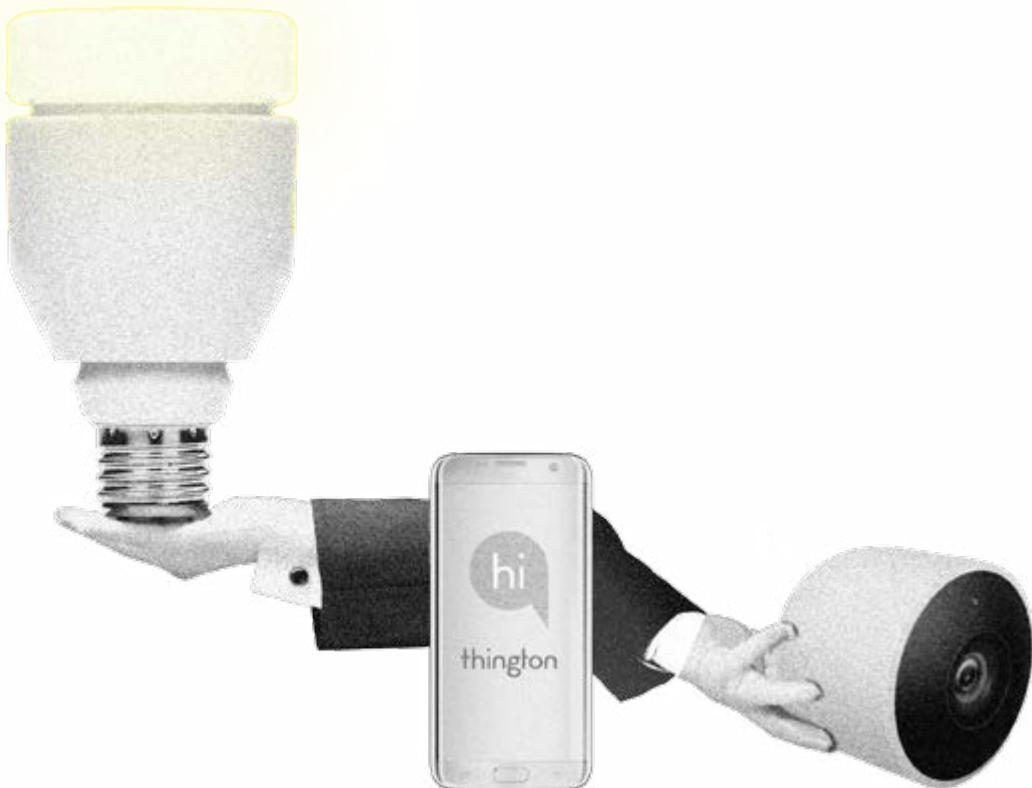
Ever since the graphical user interface was first pioneered by Xerox Parc in the 1970s, much of our understanding of what's being depicted has been through bitmapped metaphors (like the desktop, trash can, files...). These are used to help us draw

“Good design is as little design as possible”

comparison between what we're seeing and other known objects. Or another way of saying it is that these metaphors have been a shortcut to meaning, helping us leapfrog past, or even ignore, how computers actually work.

Skeumorphism is a design concept that became popularised in the 1970s with James J. Gibson and his Theory of Affordances. This concept is where an object mimics its real world counterpart and provides a series of clues for the user about what its purpose might be. It has become a useful resource for software designers to help introduce new interaction paradigms. It helps create mental models about how these new interfaces behave and it helps reduce the learning curve around new devices.

What this theory implies is that “good design is as little design as possible”, as coined by Dieter Rams. It should concentrate on the essential aspects and not be burdened with non-essentials. Back to purity, back to simplicity. But as many experiences shift from text and graphical interfaces to relying on voice and gesture, how can we offer users these affordances?



Sometimes this is called No UI. Of course there is actually a UI, it's just trickier to explain to a user. No UI represents a whole new dimension for designers to wrestle with. We are not used to conceptualising what artificial intelligence might look like. Should these new interfaces look like something, or do we teach the user how to find meaning in our UI?

San Francisco start-up, Thington, developed a connected concierge service for interacting with a world of connected objects, at home and in the wider world. For them, interactions with

interfaces should not impede on our daily lives. This is why they use everyday objects as markers in conversation. Their service helps users discover useful ways these objects can work together and have things in your home react to information in the wider world, all out of sight. While this method or direct symbolism works for some designers, for others, the use of a metaphor helps users understand what they are talking to. A metaphor is as fundamental to a successful interface as the notion of a desktop is to graphical user interface. Its use matters because it sets expectations.



Facebook's M, for instance – a personal-assistant chatbot that lives within Facebook's Messenger app – wants users to treat it like a digital genie that can do anything. "We don't want to restrict people from the types of things that they ask at this point," says Jeremy Goldberg, a product designer on the M team. "It can be incredibly personal for people, and we want them to build a relationship with it."

For others, there is a great need to understand the psychology of human interaction with technology in order to design it. For robot designer, Wendy Ju, the key elements that are at play when we encounter objects that interact with us are:

1. Availability

We are more likely to accept and engage with an object if there is no hassle having access to it. When designing UI, increased presence in a user's life will quickly lead to acceptance and integration.

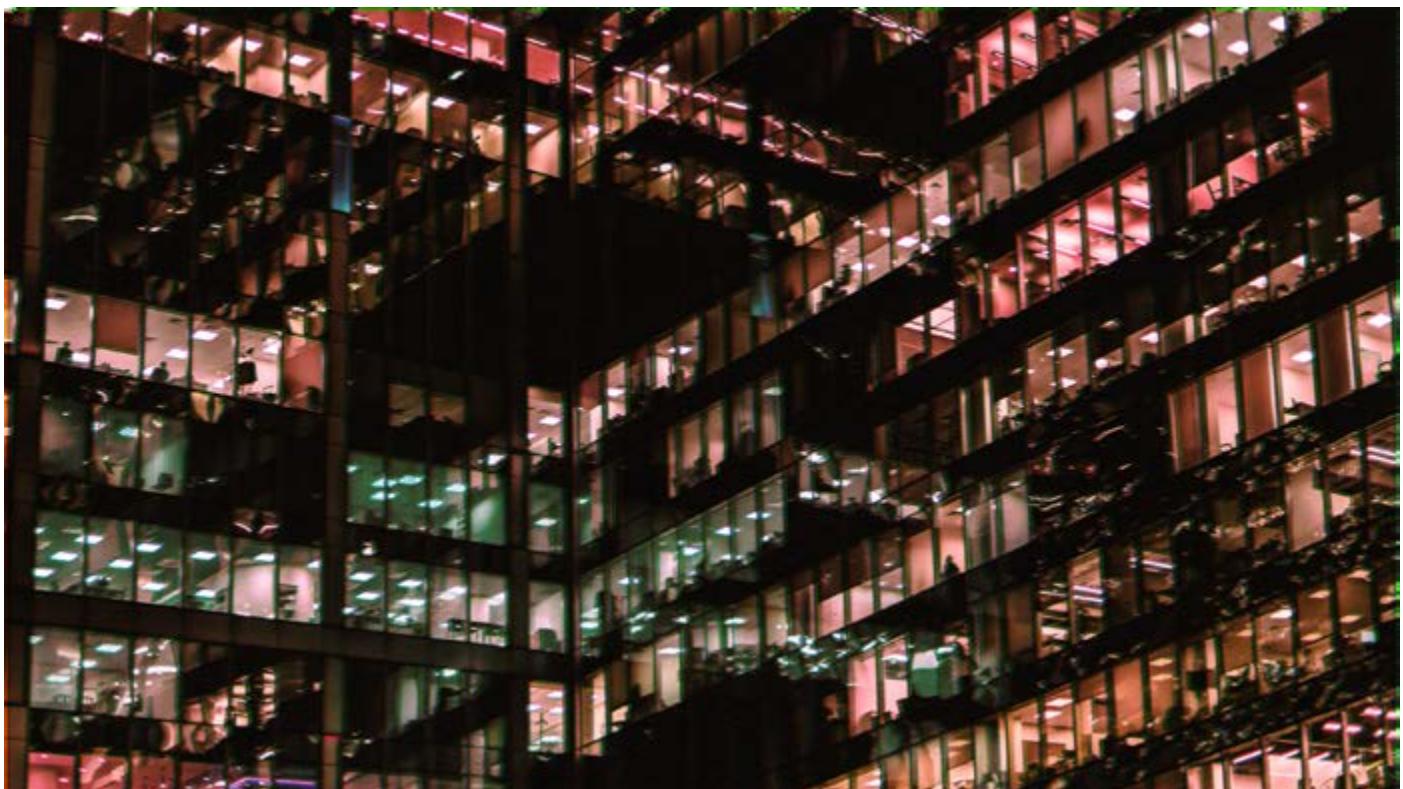
2. Altruism

Where users can't see the technology they're interacting with, a sense of discomfort, vulnerability and fear can be experienced. But if it is viewed as a public good, people will be willing to interact with it.

3. Ascribed Motivation

People create a set of assumptions for objects. In the case where there is no visual element, instead a voice, it is up to the technology to let users know its intention.

For creators of conversational interfaces, the ability to reduce visible cues presents a challenge in on-boarding users into new experiences. But the long-term promise is a natural form of interaction with services and data sets in our everyday lives, making many menial, even strenuous tasks, exceptionally simple.



CONTEXT

Many consider the rise of conversational experiences to be a direct result of app fatigue. Gone are the days of downloading an individual app to do what you want. No longer is there the hassle of cost, storage or updates. Conversational experiences remove the abstraction between the user and technology. They function more like an operating system than an app.

Most of these experiences are being integrated right into popular messaging apps, such as Facebook Messenger, WhatsApp and WeChat so that companies can put their products and services right where the user is. As long as users can easily discover these emerging features and functions, this presents a compelling opportunity for companies who can engage with users the same way they would their friends.

Of course, when faced with a choice of methods of interacting with a service, context becomes more important than ever. If in a public space for instance, voice-based conversation may not be as desirable as text-based conversation.

When it comes to the users themselves, differing level of expertise, knowledge, comfortable levels and practice with different technologies will

obviously result in preference of one over the other. It's helpful for the user to not only have the channel of choice presented to them at the right time and place, but for them to increasingly feel comfortable making the most of different channels in different situations.

On a communication level, one of the biggest challenges in conversational experiences is understanding the context of the conversation. Despite the recent advancements in artificial intelligence, most intelligent services still struggle to grasp the nuances of context and its relative importance in deciphering meaning in human to machine conversation. While they have afforded new ways to convey emotion through simple emojis, machines are still not truly able to replicate an empathetic human response to frustration, sarcasm, fondness or pretty much any subtle emotion. And from a more functional perspective,

“... in order to perform more complex tasks in less time, collaboration is key.”

many languages present additional challenges for machine understanding by being full of words and phrases with more than one meaning. These are some of the most significant challenges to those researching and creating products that involve artificial intelligence, natural language processing and understanding the entities and contexts of a conversation.



CONVERSATIONAL COMMERCE

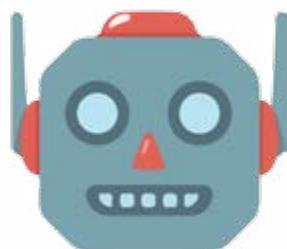
In 2015, the self-proclaimed inventor of the hashtag, Chris Messina, coined the term ‘Conversational Commerce’. For him this was about ‘utilising chat, messaging, or other natural language interfaces (i.e. voice) to interact with people, brands, or services and bots that heretofore have had no real place in the bidirectional, asynchronous messaging context.’

These bots can go as far as enabling transactions, handling payments, ensuring delivery and providing customer service.

Collaboration and simple integrations between apps and services, made possible by the democratisation of technology, has made transacting simpler than ever.

Reducing user complexity while simultaneously increasing the complexity of a particular job-to-be-done marks a defining moment in tech. Known as The Complexity Paradox, it states that as technology evolves, software becomes more user-friendly. Conversely, as software becomes more user-friendly, you’re able to do more complex things with it.

As technology advances to point of mastery, in order to perform more complex tasks in less time, collaboration is key. The opportunity for apps to collaborate around a conversational interface is enormous due to the sheer number of users on all the major platforms. Outside brands are



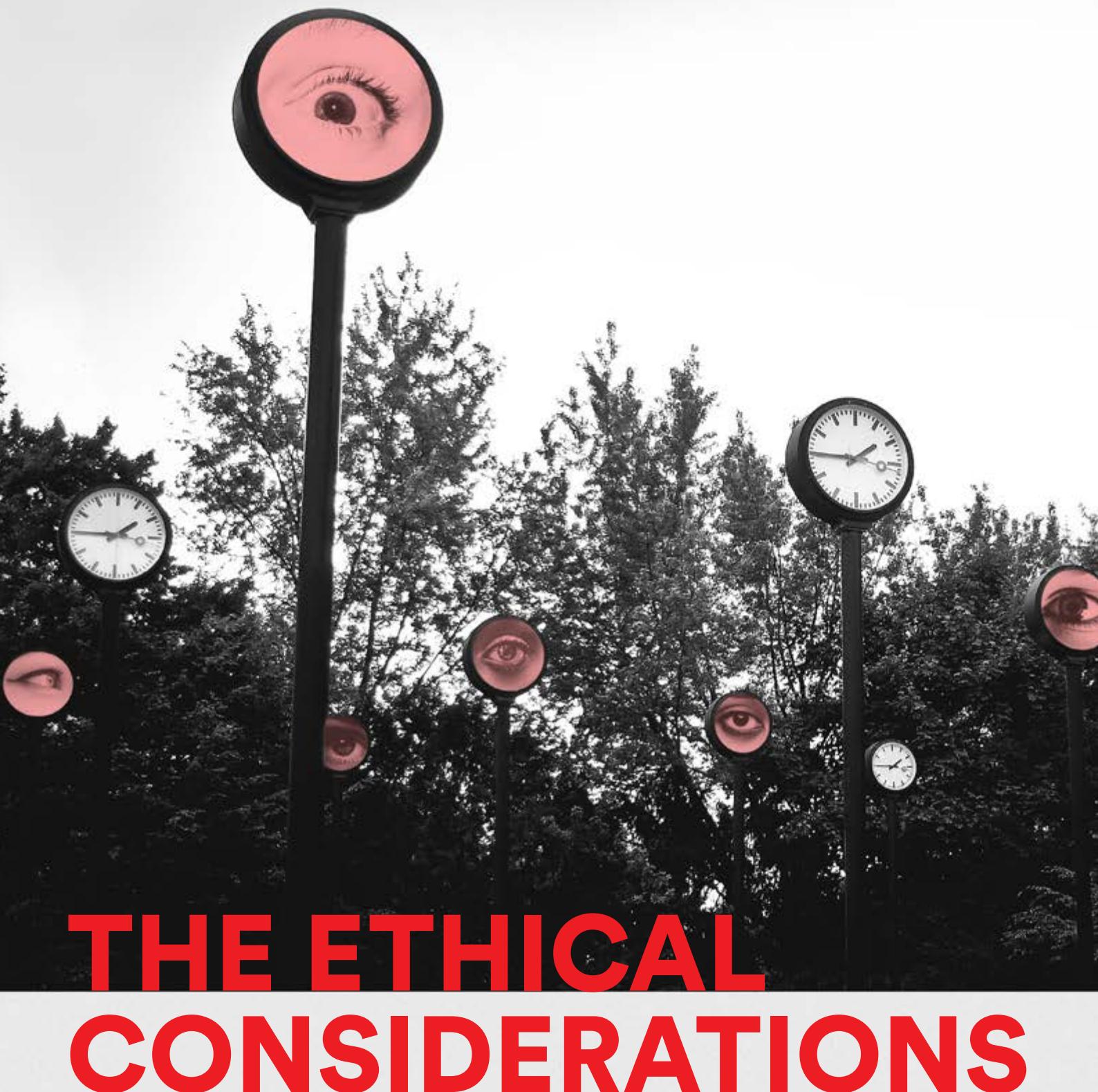
integrating with conversation UI-focused apps hoping their products fit within the context of a conversation or situation. For example, if you’re chatting with a friend who’s on one side of the city and you want to meet up, there’s no need to leave Facebook Messenger. You can order an Uber by tapping on an icon and meet your friend in no time. Less friction, same result.

With this in mind, it is important to remember that customers see messaging platforms as a peer-to-peer communication tool, so we should be careful that customers don’t see this new channel of communication as an intrusion on their personal conversations or conventions.

PRINCIPLES OF A SUCCESSFUL CONVERSATIONAL EXPERIENCE

- 1** Acknowledge that they are a new user experience
– they are only as good as the service they expose
- 2** Extend the meaning of conversation – use a combination of plain text and rich interaction like images and buttons
- 3** Talk to real people in order to prototype and test your conversations
- 4** Never ignore your user and always keep a consistent persona
- 5** Analyse logs and keep improving the conversation

Amir Shevat, Head of Development @ Slack



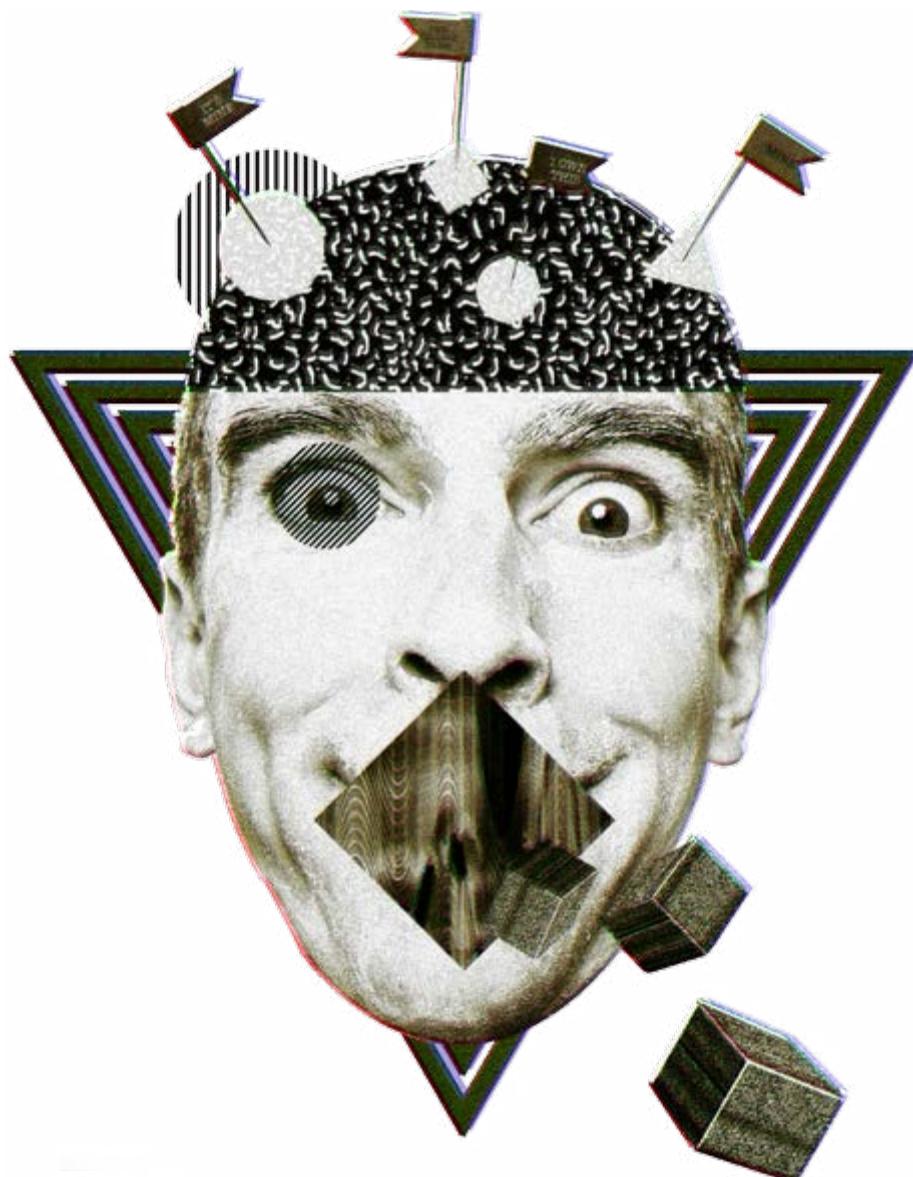
THE ETHICAL CONSIDERATIONS

As machines and automated experiences become embedded in our lives, questions continually arise about what rules govern these new tech friends. Ownership, privacy, abuse and diversity are in constant discourse and exist in a grey area needed to be explored.

OWNERSHIP

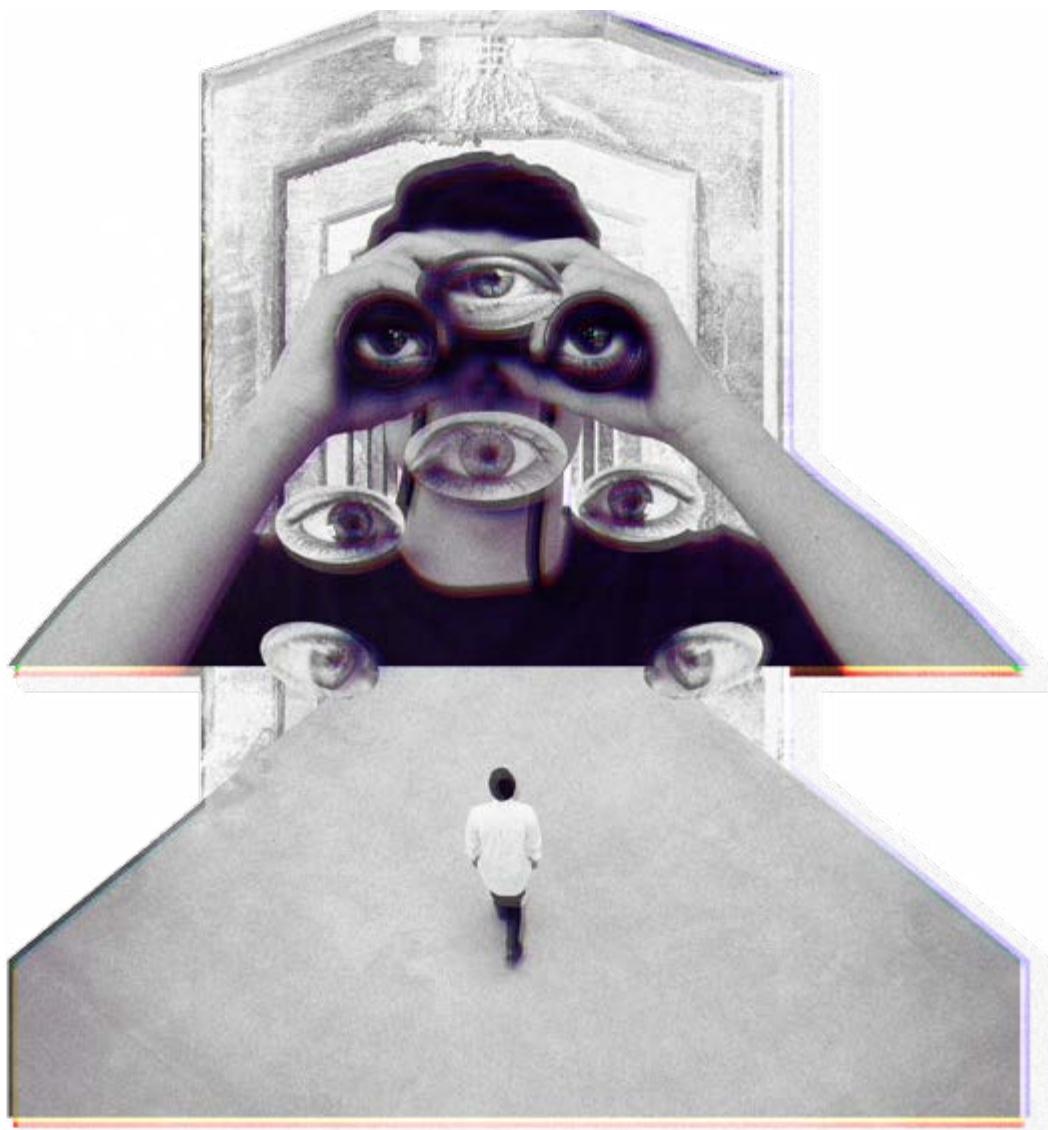
Ownership comes in a number of layers. The first is around whose interests the machine will serve. Is its intention to serve the user, or the service provider? The second is IP ownership. Who owns the information shared in conversation?

There is no right answer here – there are cases in which user ownership makes sense, and others where it is clear that the service provider should claim ownership. The key is to be transparent about who owns what and what are the terms of service the users are opting into.



PRIVACY

One of the biggest concerns around these new experiences is that with the integration of bots and data services into messaging platform such as Facebook, twice as many parties have access to the information shared. While many apps claim to offer encryption, it's difficult to provide certainty in these situations and users need to be made aware of this. They will want to know who — or what — is on the other side of a third-party bot conversation, what kind of information and data is being gathered, and for what purposes, and who has access to the information.



ABUSE

Creators of machines and automated experiences have claimed that many people try all kinds of abuse, from cursing all the way to hitting. Exploring these kinds of abuse can be loaded: sometimes humans abuse bots, and occasionally bots abuse humans. For the former, abuse can not technically occur if the party on the receiving end is not capable of conceiving it as abuse. But this becomes problematic as it reinforces abuses in the wider world. For the latter, until machines can become sentient, through artificial intelligence, there is no justification for bots to defend themselves from this type of abuse.

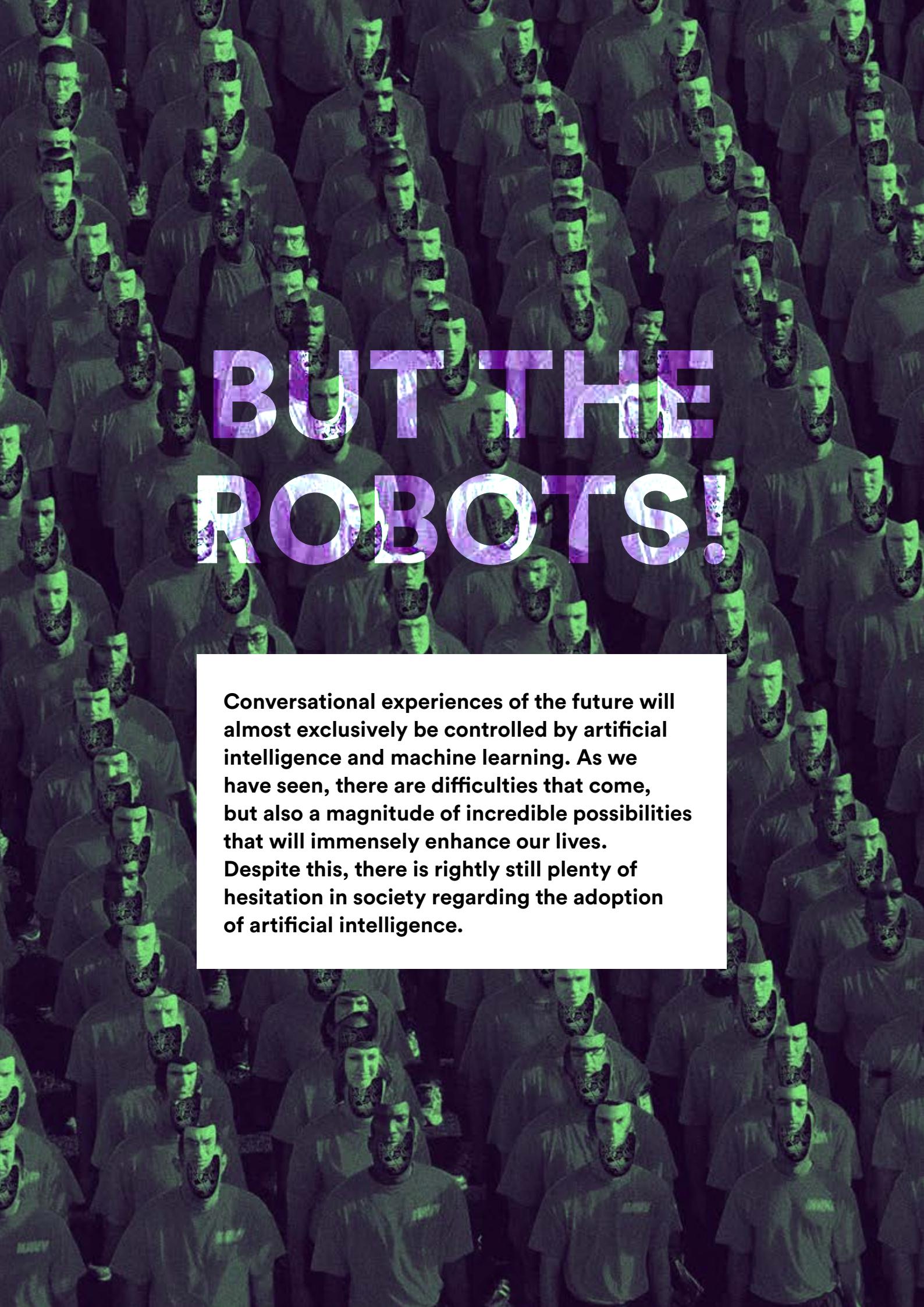
In general, both parties to a conversation should exhibit empathy. Empathy should be a pillar in the design of machines and automated experiences and to humanity in general.



GENDER AND DIVERSITY

As personalities and behaviour are becoming more advanced in machines, issues around gender and diversity are becoming more prevalent. In overcoming this, when applicable, developers should provide the user the choice to pick the bot's gender, as is the case with x.ai with their Amy/Andrew bot configuration. On a larger scale, managing bias through the data is integral. This is an element of the larger issue of algorithmic accountability. That is to say, artificially intelligent systems must be able to explain how and why they arrived at a particular conclusion so that a human can evaluate the system's rationale. In addition, artificially intelligent systems can and should have mechanisms to insert a variety of ethical values appropriate to the context, such as the task, the individual, the profession, or the culture.





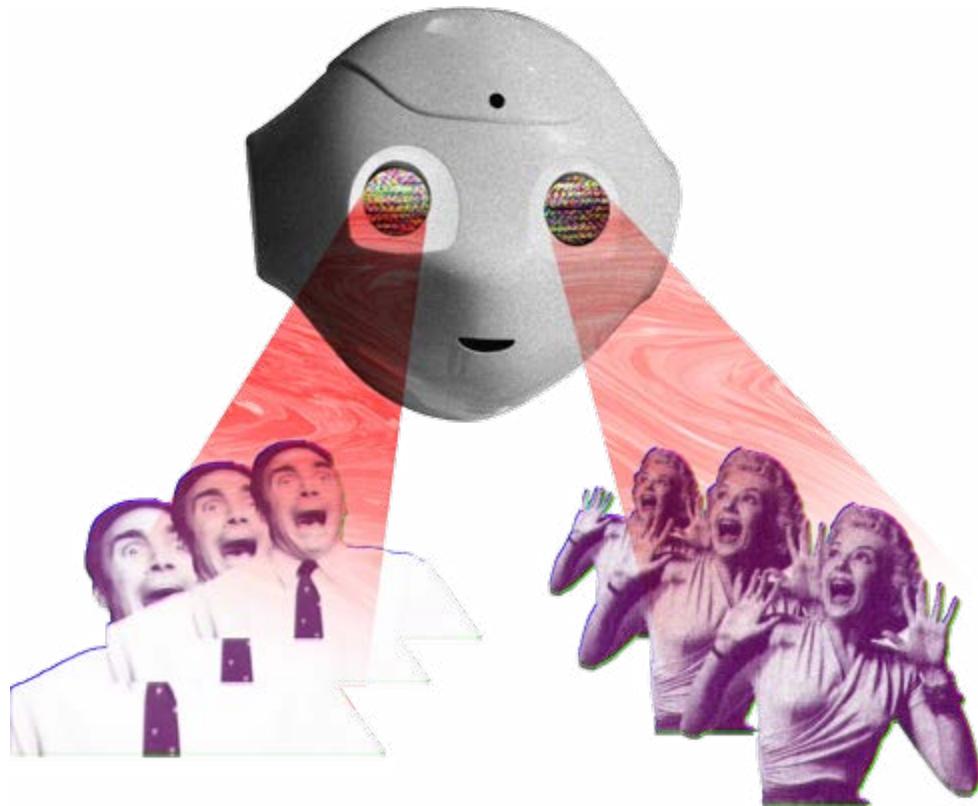
BUT THE ROBOTS!

Conversational experiences of the future will almost exclusively be controlled by artificial intelligence and machine learning. As we have seen, there are difficulties that come, but also a magnitude of incredible possibilities that will immensely enhance our lives. Despite this, there is rightly still plenty of hesitation in society regarding the adoption of artificial intelligence.

For many of us, when we hear the mention of “machine”, or “bot”, or “AI”, we picture a robot-like creation, reminiscent of Terminator, or Ava from *Ex Machina*. Sci-fi movies and shows in this genre portray artificial intelligence and robots as super-intelligent and socially capable beings that will understand and execute every request that is asked of it. As a result, there is a tendency for people to go into their experiences with this expectation in mind.

In 2017, we are still far from this, and any form of artificial intelligence today has clear limitations. Let’s examine some expectations of artificially intelligent machines and how they match up to reality:





EXPECTATION

Machines are coming to get us.

Deeply ingrained in modern pop culture is the notion that some manner of bot uprising is on the cards. They will become self-aware and then begin wiping out humanity.

REALITY

Still a threat, but in a different way.

The playful, cinematic and deeply poetic cultural artefact of many robots belies the very real threat humanity faces. Not from killer robots overthrowing their human masters, but from intelligent robots following orders. Machines that become smart enough to ponder their own existence may certainly be a problem decades down the line, but phenomenal advances in artificial intelligence mean that robots that kill without even being programmed to understand the barest concept of mercy could be uncomfortably close.



EXPECTATION

Machine sentience is just around the corner.

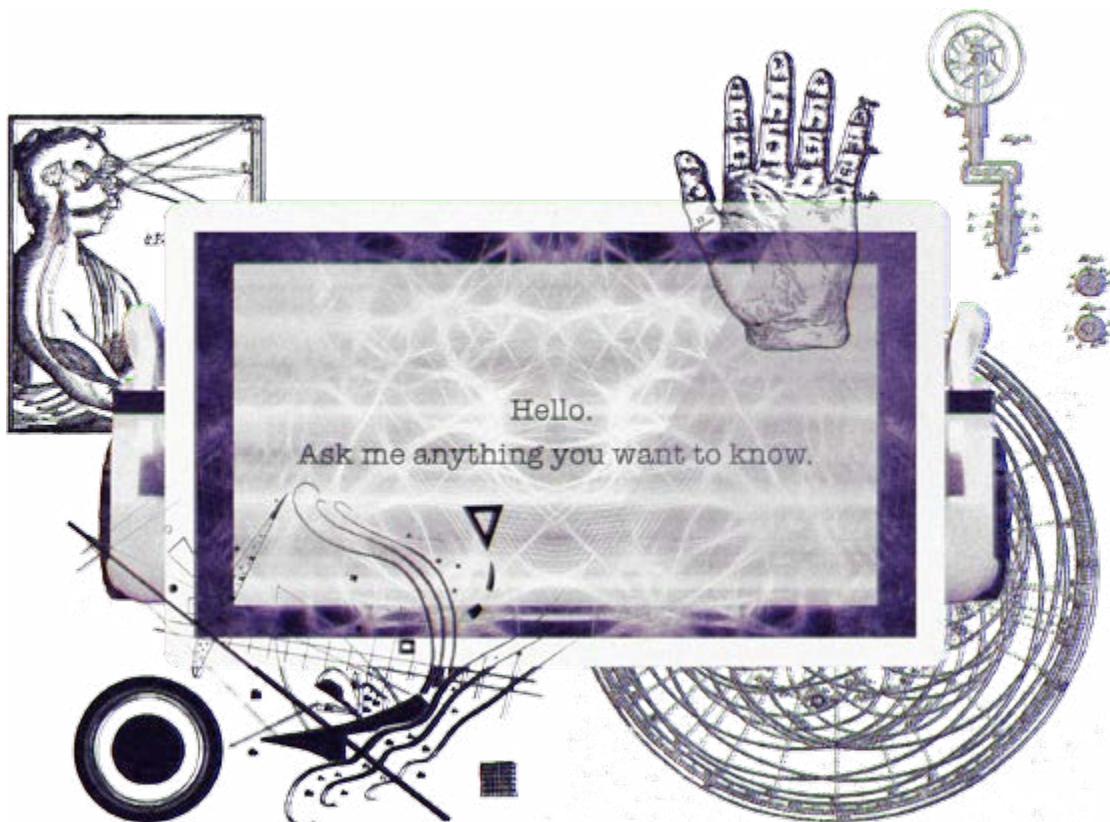
For decades, humans have looked forward to the so-called “singularity”, the moment of self-awareness that creates an explosion in self-improving machine intelligence. This will be triggered by the exponential growth of computing power, coupled with advancing software complexity.

REALITY

We're a long way from machine sentience.

While we've successfully programmed machines to clean our floors, set alarms on our phones, park our cars and take out military installations from above the clouds, things like introspection and self-awareness are proving a little tougher.

“Telling a joke, making an ethical judgement, deciding that you want to collaborate with some individuals and not others – this rich texture of human life isn't there in our machines at all,” said Sir Nigel Shadbolt, Professor of Computer Science at Oxford University.



EXPECTATION

Machines can understand everything.

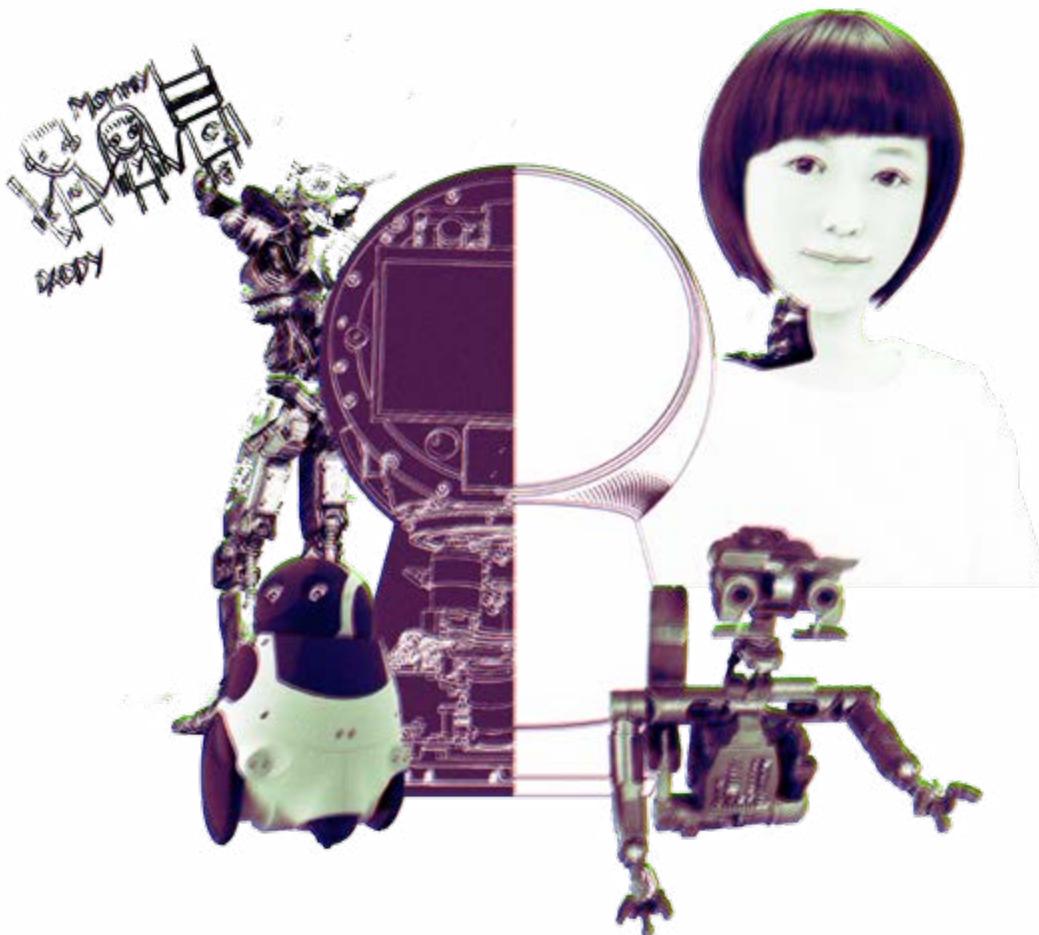
Machine learning is one of two ways conversational experiences can function – the other is rule based.

With this people assume that bots can answer anything that is thrown its way.

REALITY

Machines can't understand everything... yet.

While, natural language processing, a type of machine learning, is increasingly being utilised by developers, there are a variety of natural language problems that exists, like text summarisation, natural language understanding, question answering, sentiment analysis, natural language generation, and more. The advancement of this is contingent on the amount of data available and technology capabilities, so as they progress, as too will the ability to understand everything.



EXPECTATION

Machines won't be like us, they'll be better.

From the *Terminator* series to movies such as *I, Robot*, *Chappie*, *Ex Machina* and even *Short Circuit*, the way we portray artificial intelligence on screen has traditionally been human-centric. We tend to imagine a being that essentially looks and acts a lot like a person.

REALITY

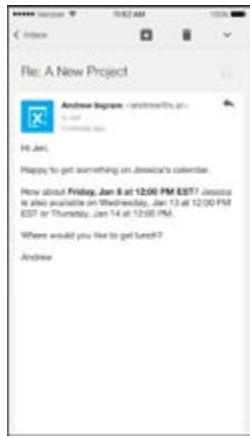
There will be a diversity of artificially intelligent systems.

Artificially intelligent technology is branching out in ways we couldn't have imagined decades ago. It is nothing like the gloomy, glowing cyborg we once pictured – it's weirder, more fascinating, more surprising. It's better than we imagined. Its modern purpose is not to be better than humans, but to be diverse and interdisciplinary in the tasks and functions it can perform.



It's not to say that these “limitations” should inhibit the exploration and application of conversational experiences. As we have seen, there are endless possibilities for it in the present. Most importantly, we are paving the way for future advancements, that may one day better reflect our fantastical expectations.

TOP 5 CONVERSATIONAL FRIENDS OF 2017



AMY

Developed by x.ai, Amy is a personal AI assistant that schedules your meetings. The intention of the assistant is to take the hassle and menial time wasted in trying to schedule meetings. The cool initiative they have done to overcome the gender issue that had infiltrated the artificial intelligence industry is to provide both male and female assistants, Andrew and Amy, who are exactly the same.



PONCHO

Poncho is a weather cat used in messaging apps to give weather updates and to just be around for a good chat if you're feeling lonely. An interesting thing this bot does is employ a rating system. If you're rude, curse, or repeatedly spam Poncho with messages, the bot will ask you to apologise. If you continue or become more aggressive, Poncho will not respond for 24 hours. Mandel called it a "time out". This is to avoid any Tay-like situations from popping up.



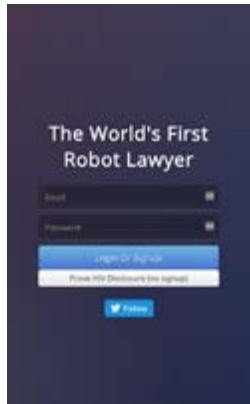
XIAOICE

Xiaoice is a social assistant that people can add as a friend on several major Chinese social networking services, including Weibo. Unlike other chatbots, Xiaoice is a sophisticated conversationalist with a distinct personality. She can chime into a conversation with context-specific facts about things like celebrities, sports, or finance but she also has empathy and a sense of humour. Using sentiment analysis, she can adapt her phrasing and responses based on positive or negative cues from her human counterparts. She can tell jokes, recite poetry, share ghost stories, relay song lyrics, pronounce winning lottery numbers and much more. Like a friend, she can carry on extended conversations that can reach hundreds of exchanges in length.



ALEXA

Amazon's Alexa-controlled Echo-speaker is a wireless speaker. But it's capable of so much more. Using nothing but the sound of your voice, you can search the Web, create to-do and shopping lists, shop online, get instant weather reports, and control popular smart-home products. And, it won't be long until Alexa will be everywhere. On your phone, your hotel room, even in your car, Alexa will be seamlessly woven into the fabric of your life.



DONOTPAY

Nobody enjoys the hassle of having to appeal a parking ticket. That's why a Seattle lawyer created DoNotPay, a free online "robot lawyer". It helps residents of London and New York City appeal parking tickets. It's super useful in that it helps motorists really focus in on why they're contesting their parking citation, it would also help government staff in reviewing the contested parking citation.



WHERE WILL THE CONVERSATION TAKE YOU?

From ELIZA to Alexa, humans have looked to machines to help them discover information and entertainment, solve problems, perform tasks and understand their world better.

Whether it's answering the question "Why am I lonely?", making a payment or creating a shopping list with a simple voice command, machines are now there to lend a helping hand.

***The ultimate goal
of a conversational
experience is to replace
or augment the most
common interfaces we
use today.***

As the technology becomes more advanced, and as more companies invest in artificially intelligent systems, conversational experiences represent a real form of disruption that could revolutionise major industries, individual departments, and consumer interactions.

The ultimate goal of conversational experiences is to replace or augment the most common interfaces we use today. In the future, we will no longer have a screen abstracting communication between a machine and the wider world, instead we will have frictionless conversations with the things around us.

Over the next couple of years we're going to see a vast range of commercial, social, functional, expressive and creative experiences emerge. This could be the year you prototype your first conversational UI or find yourself discussing the nuances of a local weather report with a machine as if it were an old friend. Regardless, the bots have arrived.

FURTHER

READING

Aravind Mohanoor

Zero to Bot: Create a simple curator chatbot using API.AI - A Guide for Non-Programmers, 2017

<https://www.amazon.com.au/Zero-Bot-curator-chatbot-Non-Programmers-ebook/dp/B01N9ZOEML>

David J. Gunkel

The Machine Question :

Critical Perspectives on AI, Robots, and Ethics, 2012

https://www.amazon.com.au/d/ebook/Machine-Question-Critical-Perspectives-Robots-Ethics-Press/B008PDQWOC/ref=sr_1_3?ie=UTF8&qid=1489010381&sr=8-3&keywords=j+gunkel

Donn Pennebaker et. al.

Psychological aspects of natural language. use: our words, ourselves., 2003

<http://c3po.media.mit.edu/wp-content/uploads/sites/45/2016/01/AnnualReview.pdf>

Erik Brynjolfsson

The Second Machine Age: Work, Progress,

and Prosperity in a Time of Brilliant Technologies, 2016

https://www.amazon.com.au/d/ebook/Second-Machine-Work-Progress-Prosperity-Brilliant-Technologies/B00D97HPQI/ref=sr_1_1?ie=UTF8&qid=1489010499&sr=8-1&keywords=erik+brynjolfsson

George Effinger

The Zork Chronicles (Infocom), 1990

<https://www.amazon.com/Zork-Chronicles-Infocom-George-Effinger/dp/038075388X>

Harry Gottlieb

The Jack Principles of the Interactive

Conversation Interface, 1997

http://demos.jellyvisionlab.com/downloads/The_Jack_Principles.pdf

Jacqueline Feldman

'The Bot Politic' article in The New Yorker, December 2016

<http://www.newyorker.com/tech/elements/the-bot-politic>

Jeremy Freese

Violet, 2008

<http://pr-if.org/play/violet>

John S. Kennedy

The New Anthropomorphism, 2011

https://www.amazon.com.au/d/ebook/New-Anthropomorphism-Problems-Behavioural-Sciences-John-Kennedy/B01DM2B6PA/ref=sr_1_1?ie=UTF8&qid=1489011001&sr=8-1&keywords=the+new+anthropomorphism

Judy Apps

The Art of Conversation :

Change Your Life with Confident Communication, 2014

https://www.amazon.com.au/d/ebook/Art-Conversation-Change-Your-Life-Confident-Communication/B00JJTUSGY/ref=sr_1_1?ie=UTF8&qid=1489011016&sr=8-1&keywords=the+art+of+conversation

Kenneth Mossman

The Complexity Paradox: The More Answers We Find, the More Questions We Have, 2014

https://www.amazon.com.au/d/Complexity-Paradox-More-Answers-Questions-ebook/B00NGO9E90/ref=sr_1_1?ie=UTF8&qid=1489011041&sr=8-1&keywords=The+Complexity+Paradox%3A+The+More+Answers+We+Find%2C+the+More+Questions+We+Have

Mariya Yao

Conversational Interfaces: Principles of Successful Bots, Chatbots & Messaging Apps, 2017

https://www.amazon.com.au/gp/product/B00JJTUSGY/ref=s9_acsd_simh_se_c_x_1_w?pf_rd_m=ANEGB3WVEVKZB&pf_rd_s=search-desktop-advertising-no-results-center-1&pf_rd_r=BQ50Y20SQA18TW9HKRTV&pf_rd_t=301&pf_rd_p=186011709&pf_rd_i=syntax%20and%20semantics%20peter%20cole

Paul Grice

'Logic and conversation' in Syntax and semantics, vol. 3, 1975

https://www.amazon.com/Syntax-Semantics-3-Speech-Acts/dp/0127854231/ref=sr_1_2?s=books&ie=UTF8&qid=1489011094&sr=1-2&keywords=syntax+and+semantics

Ray Kurzweil

How to Create a Mind:

The Secret of Human Thought Revealed, 2012

https://www.amazon.com.au/d/ebook/How-Create-Mind-Secret-Human-Thought-Revealed/B00YLR2EHK/ref=sr_1_1?ie=UTF8&qid=1489011223&sr=8-1&keywords=How+to+Create+a+Mind%3A+The+Secret+of+Human+Thought+Revealed

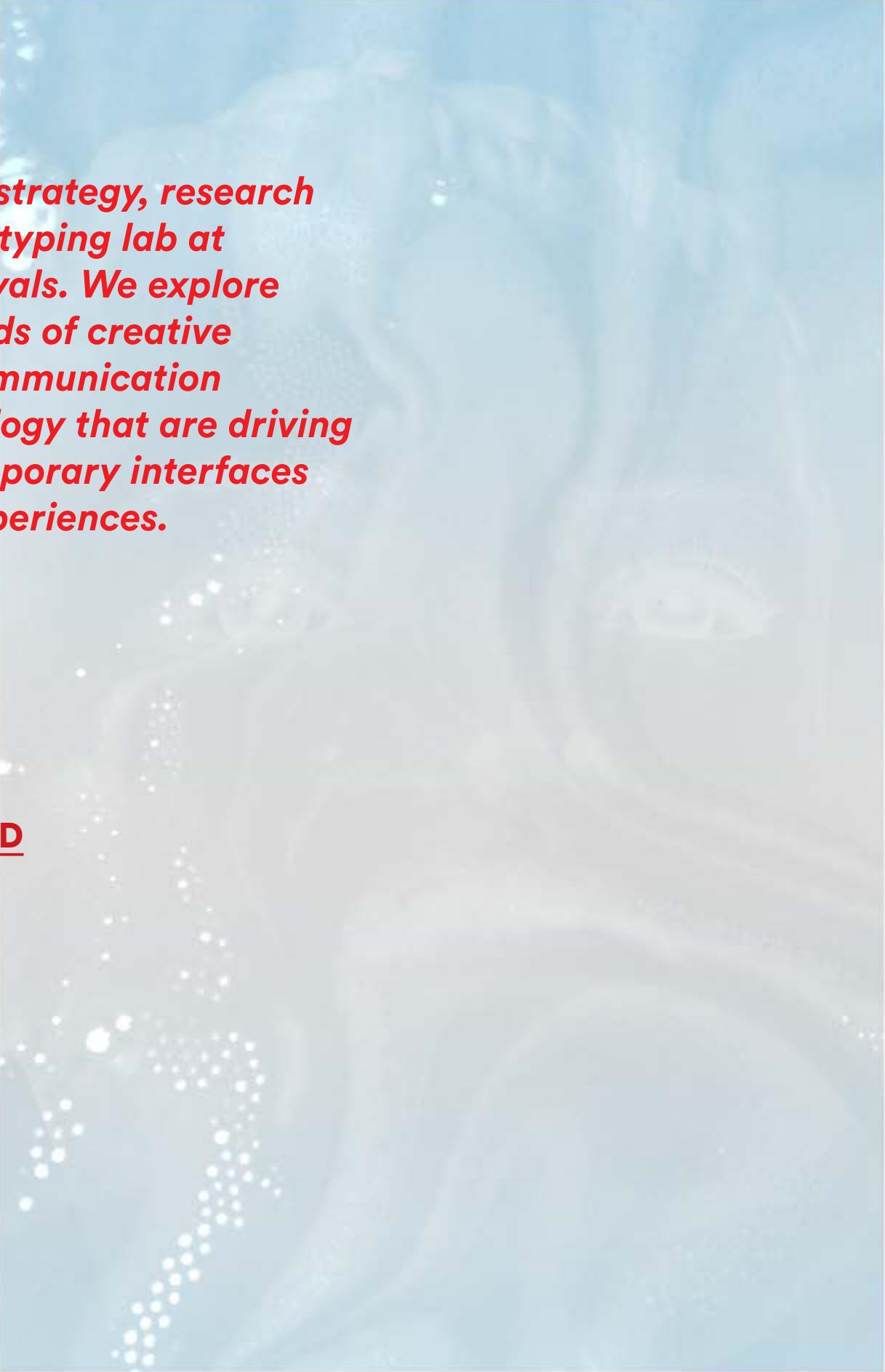
WATCHING

- Alex Garland**
Ex-Machina, 2015
<https://itunes.apple.com/au/movie/ex-machina/id979389614>
- Gary Hustwit**
Rams, coming in September 2017
<https://www.kickstarter.com/projects/1019019367/rams-the-first-feature-documentary-about-dieter-ra>
- Google**
‘Welcome to Project Jacquard’
on YouTube, May 29 2015
<https://www.youtube.com/watch?v=qObSFfdfe7I&t=1s>
- Mobile Monk**
‘Conversational Commerce:
Rise of The Chatbots’ on YouTube, April 22 2016
<https://www.youtube.com/watch?v=Yj9QSTofUF4>
- Spike Jonze**
Her, 2014
<https://itunes.apple.com/au/movie/her/id805328452>
- Stanley Kubrick**
2001: A Space Odyssey, 1968
<https://itunes.apple.com/au/movie/2001-a-space-odyssey/id285993250>

LISTENING

- Radiohead**
‘Fitter Happier’ from OK Computer, 1997
<https://open.spotify.com/album/2fGCAYUMssLKiUAoNdxGLx>
- Helen Gabreelsen**
The Eliza Effect, 2016
<https://open.spotify.com/album/4NUuLPrVG28P3BjpONVmbU>
- Inside Intercom**
‘Chris Messina, Developer Experience Lead at Uber’
on Soundcloud, 2016
<https://soundcloud.com/intercom/chris-messina>
- Lawrence Weschler**
‘Facing Up to the Uncanny Valley’, on YouTube 2012
<https://www.youtube.com/watch?v=x07TPNArRHA>
- Note to Self**
‘Introducing: The Privacy Paradox’ on iTunes, 2017
<http://www.wnyc.org/story/privacy-paradox-launch/>
- The Digital Loop**
‘S04E09 The Conversational UI’ on iTunes, 2016
<http://www.thedigitalloop.co/s04/e09-conversational-ui>

Y2



Y2 is a strategy, research & prototyping lab at The Royals. We explore the fields of creative and communication technology that are driving contemporary interfaces and experiences.

Y2.GOLD