



THE FUTURE OF AI IS CONVERSATIONAL

INTERVIEW OF JAKUB ZAVREL, CREATOR OF TEXTKERNEL, CURRENT FOUNDER AND CEO OF ZETA ALPHA.

AI IS NOT ALL-KNOWING. DIALOGUE IS ESSENTIAL FOR HER AS IT IS FOR US.

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BY YVES LOISEAU



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The idea of conversational AI leads to 2 main questions :

- Do conversations make us smarter ?
- Is this the purpose of a conversation ?

On the 1st question, even if some episodes may lead to doubts, it seems reasonable to answer in the affirmative. On the one hand, conversation is an effective way to learn and obtain information. On the other hand, as soon as some hindsight and critical thinking are at work, we can consider that even the worst conversations can enrich us and make our mind become more refined through contact with others.

On the second question, we have to admit that our conversations are not always aimed at gaining cortical finesse, and that's good.

Why does AI need to be conversational? Why does AI need some kind of dialogue or conversation in the first place ?

To answer this, you have to go back and reflect on what the purpose is of all this AI stuff that we're building. In my view, the primary purpose of all this is because humans have a limited capacity of perceiving the world around them. Their perception is limited in space and time and has a limited bandwidth. Definitely in the information landscape we're in, there is an infinity of things that we should know, but have no time to learn.

So the goal of AI is to build gadgets that will help us conquer all of that information. And to do that properly, these gadgets need to know what is relevant for us and what is the right thing to present to us at a given time. This in turn is influenced by so many factors, that if you would have to fill that into a form, you would spend all of your life filling that form.

Conversation is essentially a method to solve that complexity by finding out which information is relevant within a context at a given right moment without overburdening the user.

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Very interesting. If I follow you, conversational AI is about alleviating doubt, by asking questions so that machines can, like an enzyme, digest a world of information for us.

When it comes to asking questions, is there any recipe for asking the right questions? Or is it more a matter of reformulating like a coach would to loosen up the human mind and foster free flowing instructions? In other words, is there any methodology for the questioning conversation?

Asking questions is not all there is to conversation; conversation has many purposes. It is a relationship and an entertainment as well as a pass time and a way to create alignment or influence. In fact a good debate is about an actually meaningful intellectual exchange not just about asking questions.

Conversational AI is not there yet. But it's certainly beyond just asking questions and recording the answers. If you look at the ingredients of modern AI, conversational systems removing doubt is the basis and we've had that in search engines already for a long time.

If you say you're searching for a Jaguar the system will ask you whether you mean the car or the cat for instance.

To avoid asking the same questions over and over and to be able to interpret an answer within the context of the conversation is crucial not only within the conversation, but also over a longer period of time.

If I meet you again and I seem not to be aware of what we talked about before, you will not think much of me as a conversational agent :-)

What is really important in this kind of conversational game between humans and between humans and machines, is the notion of an intelligent conversation partner. And for that, obviously, a lot of a lot of different tricks are required, like memory, ability to following the thread of thought, confirmation of things you already know, alignment and other such things.

I've seen examples of, for instance, Blenderbot, faking opinions to, I suppose, fuel the conversation. For instance Blenderbot can tell you its favorite Frankie & the Witchfingers album is Brain Telephone without having actually listened to it, and even formulate an opinion if suggested Zam is a great pick as well.

What is the goal of fabricating opinions in such way? What does it bring?

If you go back to Alan Turing's definition of intelligence, as long as you can fake it, it's intelligence, right? So I believe, impersonating an intelligent dialogue agent is part of the game. And the question you really have to really ask is “where does all the content of the conversation come from?” “What guides the selection of the next sort of utterance in a dialogue?” “How do you decide whether you are going to make a joke or ask a follow up question?”

The way these modern conversational systems are built, is not with a creator who sets a set of rules. They instead are simply trained on a very large data set of conversation. So Blenderbot, LaMDA or Meena, which are some of the most powerful chatbots today, are simply very large neural networks, trained on many billions of words of conversation.

In a way, they accumulate the collective conversational patterns and wisdoms of dialogue, provided it's been published somewhere on the internet, including maybe in the future this interview. At the end of the day, Blenderbot suggesting a particular Franie & The Witchfingers album is really determined by the probabilities of that being a good conversation move in the training corpus. Fundamentally the data is the intelligence.



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Are chatbots some kind of representation of collective opinion?

Not only as they will use it to converse with you specifically based on their ability to keep track and understand context.

Let's look at how humans have conversations. I'm sure that in different cultures and in different times people tend to have different styles of dialogue right? You're the interviewer, you are the person in the supermarket, you may have a conversation with a friend or with a colleague.

Each time your conversational patterns will change. So I think we, humans, have to learn these patterns as well. And they are kind of in the data around us. Humans capture them much faster than machines.



In different cultures and at different times, people tend to have different styles of dialogue.

They don't need to be trained on a billion words of Supermarket Conversations to ask the cashier where the bread is. But I think humans are also not necessarily born with a fondness for a particular band or album.

It is, in essence, something we acquire, also based sometimes on our conversations.

Okay, so you're saying intelligent partnership in conversation is part of the game. Is it some kind of cathartic or maieutic process? Also, does it mean that the more we believe in AI, the better the conversation will be? Would you even think some people are more or less sensitive to, to conversation with a robot basically?

There's this famous example of one of the first chatbots, Eliza in the 1970s. Eventually, the secretary of the professor who built it said "could you please leave the room? I'm having a private conversation". And that was not even a very good chatbot.

The evaluation of how good a conversation is more or less in the eye of the participants, and there are no objective measures there. You could measure the skills, the form and the flow of conversation. But what I think makes the true difference lies in the purpose and meaningfulness of the conversation. .

In my opinion, the current state of the art in these bots is still rather basic in the sense that they either are good at collecting particular information, asking questions, or they are just good at going with the flow. It is very hard to combine both which would be a very significant step forward.

I've seen that the more advanced chatbots can give answers with different tones like joyful, sad, aggressive, that kind of thing. I understand that for the sake of science, it's interesting to try and do that, but on a practical level, could this be maybe part of the "product"? Could you say that you want a chatbot to cheer you up? Do you think that in the near future a chatbot will even be able to adjust the tone of his conversation based on the reaction of the other participants?

Absolutely. You have to see the generation of the next move in the conversation as simply a thing of probabilities, right? Probabilities can be conditioned on all of the data that has been used to train the system, but they can also be conditioned on other variables such as avoiding certain topics, or avoiding a selection of controversial, emotionally confusing or toxic types of patterns in speech?

So yes, I think adding such factors is the direction to explore when navigating the space of conversation agents. But it's very hard to control, it's very hard, because you will need lots of training data to actually influence that kind of thing.

Could this even be used in coaching, through a combination of reformulation and adaptation to other participants' reactions?

Well, in fact, those kinds of templates or patterns are quite easy in the old kind of more rule based approach to chatbots. It's very easy to program a dialog script, which will reformulate or ask, "Why do you think that's the case?" That's kind of a classical conversational technique. But it will lack the charms of a meaningful engaging conversation as it is much harder to achieve with more advanced machines like Blenderbot, or LaMBDA or Meena. Their whole magic lies in the fact that they go in unexpected ways.

We're able to build these amazing systems. If you look at some of the research in that area, more than half of the people prefer speaking to the Chatbot rather than a real human. In some sense, they have higher attractiveness than the average human but they are just very hard to steer.

To really integrate these machines in real world applications is super hard. That's why we're also not seeing a lot of that in major consumer applications.

“*Basically, there's a kind of science developing on how you can have one AI model specialize in coming up with the optimal way to get the other system going.*”

**Could this be achieved sequentially maybe.
Charming chatbots break the ice and then let old
fashioned chatbots ask straightforward questions.
Do you believe in such a hybrid approach?**

There's two developments right now in the conversational AI world, which are kind of leading in that direction.

First is the fact that all the content from these billions of words of conversation, does not really reside in the neural network model anymore. So that you can make a separation between the flow of the conversation and the actual topics or facts which will be injected into it, which simply can come from a search engine.

Both Blenderbot and LaMBDA basically build a web browser with a search engine into the chatbot. That's, of course, an important way to inject actual correct knowledge whereas the neural network model might go completely off the rails and start spewing all kinds of toxic content.

The second important development is from last year, with generative models such as GPT3, for example. When prompted with a small example, GPT3 is able to complete a large piece of text with pretty coherent and sensible prose. And the magic is in what you exactly need to prompt it with. If you give a prompt like "what is the value of money" maybe it will just give a kind of definition or make something very short.

But if you say write an essay in the style of The Economist on the value of money this will actually be a much better prompt as it will give much more context to know which direction to go or even which opinions to represent. Selection of these prompts is a whole new field in AI that's rapidly merging. It is called prompt engineering.

Basically, there's a kind of science developing on how you can have one AI model specialize in coming up with the optimal way to get the other system going. So you can get little symbiotic collaborations between different systems where it's no longer the humans who write the prompts, but it's actually another AI system who does that.



So you can get little symbiotic collaborations between different systems where it's no longer the humans who write the prompts.

Like a translator of intents basically?

The human still keeps on asking the same questions, but then they will be interpreted by a first layer of AI to be then injected into a second layer AI.

To be very pragmatic. Let's move on to a topic we are both familiar with: NLP in HR. Imagine parsing a CV, for instance where information perhaps is not found by the parser or maybe is missing, because the person that wrote the CV did not think it was relevant, or just plain obvious. Would you also see a very pragmatic down to earth and maybe old school use case for Chatbot, to fill in the holes?

Yes absolutely. I think that comes back to the thing I said in the beginning, where, really, the large purpose of the conversation is to fill in these gaps, but in a way, which is kind of very contextual, right?

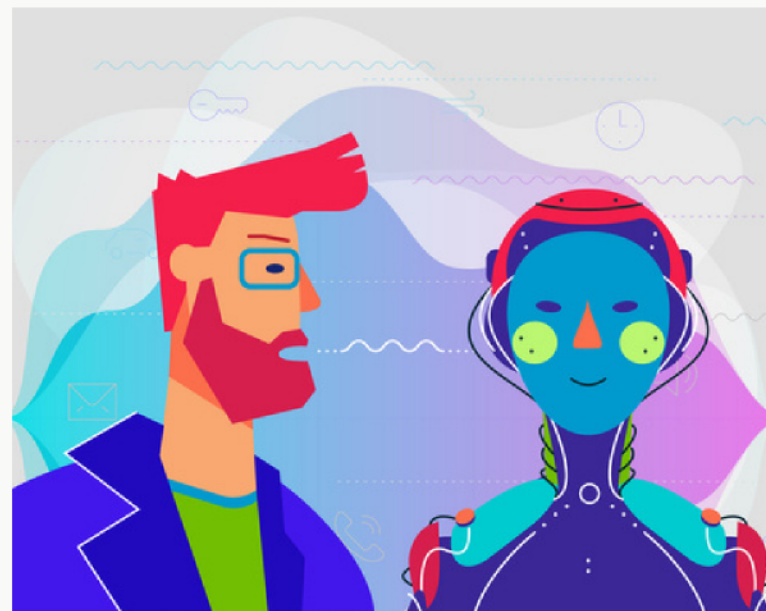
So take the example of a job application where you want to know if a person has certain skills or not, but it's not written in their CV. You, you don't want to be asking a job seeker, all the possible questions beforehand. And you don't want them to fill in the questionnaire on every possible skill that exists. You can use what they actually wrote and, of course, through some data mining, you can enrich that with some things that are related, etc.

But at the point of actually deciding on the match between their CV and a job, you might have some real doubts or some very important clarifications that are needed.

And this is a perfect use case where chatbots could make a real difference in convenience and productivity for both the candidate and the recruiter.

Also, the more creative and charming new chatbots?

It's not a black and white like "do you need an advanced chatbot or a very simple one"
I think in many cases it is more about selecting the next move in the conversation to get to the desired situation. And whether you do that in beautiful prose and good conversation and make a few jokes, or just send an SMS to the candidate and ask them to reply with 1 for Yes and 2 for No, it doesn't really matter for the application that much.



The point of a slightly more elaborate and playful conversation is to building the relationship and establishing trust to get the other person to talk.

Imagine at some point, like you said, the more advanced chatbot could break the ice and drive humans into the depth of a conversation, could they go as far as assessing soft skills or capture things that are maybe not possible to find in the CV.

Absolutely, yes. I think the value of somewhat more elaborate and playful conversation is not to get the information out in the most efficient manner. It is actually to also build the relationship and to build trust to get the other person to speak. And you won't really get a very long type of psychological profile from an SMS which asks you to answer with 1 or 2.

If the goal is to somehow get closer to the truth, would you say that through conversations you can lead people to speak their mind better?

I think the value of conversation from a systems perspective is not so much in truth or comfort, but in collaboration. You establish a sense of collaboration, when you have alignment of cognitive state between agents. And that is very complex.

Language is why humans are so good at that kind of thing. It has allowed us to evolve these wonderfully complex societies which are able together to accomplish much more than then small groups of humans or individuals can.

If we are able to couple our AI based assistants and platforms to society in a similar way through collaboration, we stand to benefit the most in terms of bringing society to the next level of productivity and sophistication.

Thank you Jakub for this fascinating upgrade. What will be your conclusion?

The path of AI is a larger sort of evolution that is heavily impactful on society, and if you can build it, it will come at some point. As the complexity of these systems is increasing day by day, year by year, it's clear the kind of capabilities we discussed will come into existence.

So my conclusion is that it is super important for a broader segment of society to have a good understanding of these kinds of developments. So that we, as a society, can go beyond idolizing AI or painting horror scenarios about it, and actually start influencing it to build the kind of, let's say, human machine collaboration that will be beneficial for us and we will be enjoying in the future. So, AI is for humans, and we need to take care of that. Thank you very much. It was a pleasure.

Interview by Yves LOISEAU, Manager of Resource Lab and Editor-in-Chief of the RoboSapiens blog. Passionate about technology and artificial intelligence, as well as the arts and humanities.



ROBOSAPIENS IS A SPACE FOR REFLECTION ON HUMANS, HR
AND THEIR INTERACTION WITH TECHNOLOGY. AT A TIME
WHEN ADVANCES IN THE DIGITAL WORLD ARE OPENING UP
POSSIBILITIES THAT DEFY COMPREHENSION, IT INVITES US
TO THINK ABOUT HARMONIOUS FUTURES BETWEEN HUMANS
AND MACHINES.

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