Why Machines Can Never Replace Humans–Tea Break with Michael Jordan

by Lynn Heller

Figure 1. Michael Jordan (l) in conversation with Hiraku Nakajima during the banquet at the opening ceremony of ICBS.

Biographical Sketch. Michael Irwin Jordan is an American computer scientist and leading expert in the field of machine learning. He is professor at the University of California, Berkeley and is an elected member of the National Academy of Engineering. This spontaneous interview happened during the lunch break of the opening ceremony of the ICBS at the People's Hall. At our table, we were having an interesting conversation about ChatGPT. Michael Jordan joined our table late. He was immediately very involved in this conversation.For him the term machine learning, rather than AI, better describes what

this technology is about. And the development around machine learning was not all of a sudden, it has been there for a long time and much of it is already a natural part of our lives.

LH: *Prof. Jordan, very nice to meet you and many thanks for agreeing to this interview. So, why don't you like the term AI?*

MJ: I don't like the focus on a single individual, being it computer or human, that were trying to understand the intelligence of a whole entity and the approval on it. I think humans work the best in collectives, and machines and technologies are designed to help the collectives. We should design our technologies to augment human capabilities, like a search engine augment our capabilities and translation engine augment our capabilities. And some of these latest large language models for example allow us to maybe write better, maybe they will give us a starting point to create something on top of that, but they don't replace us, mostly.

I think having our technologies focus on the collective level, on the systems level, and the planetary level, you know, what kind of systems are we creating, that is really the better level to focus technology on.

I don't like the AI focus on taking a single human out of their collective, put them down and then imitate them. I don't see what the point of that is.

LH: *Where do you think should AI go in future?*

MJ: For example, I work a lot on machine learning meeting economics. Because economics theory studies the collectives, like social welfare, and studies mechanism that help people behave effectively in groups. The missing ingredient in economics was that there was not much data analysis. The systems were not learning. They just were in the market; they assume the rules were known and were fixed. There is a very interesting set of research questions where you say, what if you say it is an adaptive market? What if the machine learning systems is also learning in a context of other learners and there is tradeoff and synergy, and they play games with other players. So that the overall systems work like a big economy. That is an area that exists in AI but is somehow not the focus right now.

LH: *How does it feel to witness how this area developed, how was it like 10 years ago, before the hype?*

MJ: Everything was smaller, I mean everything what you see right now was sort of present. I like to talk about some of the early applications in machine learning, or what is now called AI, things like predicting supply chain behavior.

LH: *Oh Yes!*

MJ: Like, we have a huge number of products, how do I make sure that the right products are at the right place at the right time? And there is billion of them. So, you have to make very good predictive assertions based on data, you now just invent it. That was the beginnings of the cloud, it was companies doing supply chain modeling. There are many examples like that.

LH: *And that actually went quite far!*

MJ: Yes, it went very far, and it was very important to our modern world, you know, we won't have Alibaba, we won't have Amazon without machine learning, and that was not talked about in the newspapers or anything. And now suddenly, because it is about language, it makes everybody a little more framed?

LH: *Well, because it was about replacing people, right?*

MJ: In some sense, it was always about replacing people, depend on what kind of jobs. Someone who did logistics in the past, would sit down with pen and paper, and write down all the incoming ships and outgoing products and they would do that. Someone who was doing banking or auditing, you know, they would write these big tables out.

Obviously, computers replace a fair amount of that, and the more capable the computers are, the more amount of those low-level jobs will be replaced. And hopefully it will create some new and more interesting jobs on top of that.

LH: *What is the world post-machine learning? Now that we have all these AI gadgets.*

MJ: Oh, I think that the creative people, a lot of them will find creation on top of that. They won't take the output of the image generating system and say that's the art. They'll say, I can play with that, I can do new things with that, I can create something really interesting. And I think we will want that, as other humans, looking at that. We will not just accept the computer art and will say, that's impressive and that's amazing, but I don't think we will keep returning to it and trying to be inspired by it. Whereas the human art will still speak to us in different ways. A novel, you can have these large language models write a novel, and it will probably look pretty good and maybe it will be better than a 20-year-old could write. But it is not better than a really good novelist could write, it is not even close.

LH: *So, it is a hope or a belief that basically machines can never replace humans in thinking?*

MJ: I believe that still a large part of human capabilities will not go away, not be replaced by computers. And we care about those parts.

LH: *Exactly.*

MJ: That is the part that we find very interesting about other humans. That is the same thing when other kind of technology was created. The printing press made it possible to copy a book, before that people would write it out. That took away some jobs, and it took away a human written book. But you know that was ok, and you know new kind of music, electronic music, was created, that has never been heard before. And some humans listen to that and said, I can do something interesting with that. And I think that's what will happen. Mostly human will start to think about what they can do on top of these systems and what they can do with these systems. And that will be the more interesting use of these systems. They are tools. They can do things that are surprising. Maybe like summarizing a meeting, you can have this ChatGPT listening to a bunch of people talking and

write a summary. That's kind of wow and surprising. And there will be people's jobs maybe that are writing these summaries, and they won't have these jobs.

LH: *Does it scare you that the research moves in this direction?*

MJ: No, I am worried that things happen too fast, so that people cannot adapt, but I am not worried that it replaced humans and makes us not have futures or jobs or things to do. No, I don't believe in that.

LH: *Many thanks for the conversation.*

Lynn Heller
lynn@bimsa.cn
BIMSA