Harnessing the power of AI for actuaries

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Some insurance CEOs refer to AI as a bubble. What is your view on this? Is this something we need to be thinking about long term?
'I think this is very similar to an exponential curve. At the beginning, it moves quite slowly, but the impacts become greater and greater with time. So there's a lot of hype currently around AI, a huge amount of investment, a lot of VC money pouring in, and that can lead one to think that maybe this is overblown. But I think we cannot underestimate what this is going to do in the longer term.

If you're using the best models out there, for example, if you are subscribed to ChatGPT and you're working with the O1-Pro model, it's almost unbelievable – you almost have a PhD-level scientific assistant in your pocket, or someone with an MBA willing to talk to you about your business. And in my experience, having worked with both of those types of people, and now having worked with the best large language models (LLM) available, we're starting to get scarily close to excellent human performance on a wide array of advanced tasks. So while I think there is maybe too much hype right now. I think we need to be very thoughtful and introspect about what the future will look like and how we make this successful for our companies, our staff, our teams and wider society.'

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How do you view the European AI Act? Do you think it's too restrictive? Does it hamper innovation? Because this is the constant refrain we sometimes hear from those who are critical of it. But the EU AI Act takes a very risk-based approach. Do you think that's the right approach?
'I think overall, the European approach is heavier on regulation. And I think if this can be implemented successfully, what the European Act will do is really ensure that you've got AI that's very well aligned with society and aligned with the sorts of goals that we expect. I think it can slow down innovation. I've seen in recent weeks some discussion of which models might be exempted. So knowing exactly where the risk lies within the various different types of models that the Act is trying to regulate is absolutely key. You don't want to overregulate and stifle innovation. I think if you look at a few of the other newsworthy items coming out of Europe in the last few weeks – for example, the significant investment in training a European LLM, or the investments into various different European AI companies – this is all positive. I think a balance needs to be found. Perhaps the European way of doing things has tended a little bit towards extra or more regulation in the past, but I think overall, the balance that we seem to be heading towards is a good thing.'

Turning specifically to the actuarial profession, what area or use purposes of AI do you think could be most transformational and most useful for actuaries?
'So I think all the hype is around the way of referencing or speaking to large language models through a chat interface. I think what we mustn't neglect is what I like to call narrow AI models, which are AI models that are specifically built for a particular purpose.

Imagine you're building a model that's excellent at actuarial pricing across a range of datasets across a range of lines of business. Those are the sorts of models I think we must focus on within the actuarial profession. You can ask a Neural Language Model (NLM) – let's say again the top tier models, like O1-Pro or the DeepSeek model – for ideas, but it will be very difficult for the model to execute a full training run against a non-life pricing dataset or set assumptions for life insurance model.

What we need to focus on are all these advances in machine learning architecture that underlie large language models. How do we take those advances and apply them to the specific niche domains where we as actuaries need to build models? Set assumptions, quantify uncertainty and do useful things. So really, what I'm quite a proponent of is steering the actuarial profession towards using narrower models that don't approach general intelligence, but rather specific actuarial intelligence. That's where we've got all of the benefits that AI can bring us, which are efficiency, scale, making much better use of our data, making more accurate predictions and quantifying uncertainty around those predictions better than we've been able to.'

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Well, you've explained how narrow AI compares to general AI. But what sort of concerns do actuaries need to bear in mind when it comes to using AI? Where are the potential pitfalls? Here in Europe, the General Data Protection Regulation already prohibits the use of a machine to make important decisions about individual lives. So that's something I believe actuaries have already been dealing with up to now. Is there anything new in the AI Act that they might need to worry about?
'Yes. Let's look at it from the perspective first of more narrow and specific models, and then more general models.

From the perspective of more narrow and specific models, interpretability is obviously key. I think understanding the latest advances in how you can build interpretable machine learning models is really important for actuaries, so that you can understand decisions internally and be able to explain decisions made by these models externally. I don't think the discussions around the potential for proxy discrimination in machine learning or AI models is going away anytime soon. I think the actuarial profession needs to have excellent ideas around how we avoid or mitigate the effects of potential proxy discrimination in these sorts of models. And I think what we need to keep doing is pushing the limits of what these models can do for us. If we don't, that's a different sort of risk. It's a strategic risk that the work we do won't be as valuable.

I think when using large language models, everyone knows about the risks of hallucination. But I think there are more subtle risks. Even when it looks like a model isn't hallucinating, you have to spend a lot of time validating that any code written by these sorts of models is

correct. Are there subtle bugs? Has it made a subtle mistake? And I think a more general risk is, while you can get very good answers quickly out of the top tier models, that can also limit your own creativity and the limits of your own expertise as a person, I think these are risks that we need to reckon with.

How do we make sure that we're not outsourcing all of our cognitive burden off to a chatbot and our brains aren't being used to their full potential? This is something that's worrying me and a few of the colleagues that I work with. So I think understanding the universe of risks, whether it's the direct user risks resulting from using a model or the wider implications, that's where we need to spend time and effort.'

Well, that leads very clearly onto my next question, which is, do you see a role for AI in education or training of actuaries?
'I absolutely do. It's almost a paradox – if you feed the right context and the right background into a large language model it can give you fantastic suggestions on actuarial topics. Just yesterday, as a demonstration, I took O1-Pro, the top tier ChatGPT model, and asked it to design a new IBNR reserving method, and it did a pretty good job. An impressively good job, in fact. I think the key for me is, how do we get our actuaries up to a level of expertise as they start being educated, whether it's going through the university system in Europe, or the professional system like in the UK and South Africa.

How do we make sure that our next generation of actuaries is absorbing all of that information, becoming true experts, and not just outsourcing the cognitive burden to the machine? I think there'll be an unequal benefit of large language models in the future for people who've got their own expertise. I think there will be outsized benefits, because then you can really use these models to their full potential. And making sure that our next generation of young actuaries can experience those outsized benefits by being experts and of themselves, I think, is actually the core task of actuarial professions today.'

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Finally, thinking outside of the box a little bit, what are your predictions? What should actuaries bear in mind, looking to the future and considering the use of AI?
'I think that if we want to be successful going into the future, actuaries must stop being receivers of this technology, and we must start being creators. Let's take these fantastic concepts that have happened in the last, say, ten years, from the transformer model architecture, how to train transformers on huge amounts of data, how to make these models work across domains, and let's add our special actuarial touch to them, own the actuarial implications of these models, and not merely be end-users of a technology that's outside of the profession.' ∎