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"OK GOOGLE, SHOULD I CLICK ON THAT EMAIL?"

Designing conversational user interfaces to make us stop and think.

In recent years, data analytics tools have been given new features that enable users to query complex datasets using typed or spoken natural language. Instead of having to learn and use complex query syntax, analysts can now ask questions directly 'to' the data. Research has shown how these new ways to interact with data can improve both the user experience and task efficiency. However, central to data analysis is also knowing *what* to ask and coming up with *meaningful* questions. How can the next generation of analytics tools help users to generate more meaningful questions? This is where chatbots and voice assistants (sometimes referred to as 'conversational agents') can really come into their own, by being programmed to probe users to scaffold their questioning when using data analysis tools.

In our research group, we have begun researching how to augment human cognition by having an agent embedded

> **One such interface protects against phishing attacks by helping users think more about suspicious emails.**

in the software to proactively prompt users when looking at different data visualisations. We have found that agent prompts — even simple ones — can shift the users' attention to aspects of the data they would have missed or overlooked. It can also help them generate more exploratory questions.

Our next steps are to find out whether this proactive agent approach supports more extensive data analysis and decision making in various contexts. We want to test whether such agents may, to some extent, mitigate challenges such as overconfidence or confirmation bias. We are also exploring how conversational agents can be designed to get people to 'slow down and think' when they are about to make risky decisions. Such an interface protects against phishing attacks by helping users think more about suspicious emails, enabling them to examine specific aspects of the email before deciding whether to click the potentially harmful URL.

This line of research suggests there are new opportunities for extending the reach of chatbots and conversational agents beyond their current home; instead of answering users' queries they can instead question them, encouraging people to think in new ways.

Leon Reicherts is a PhD student at the UCL Interaction Centre and part of the Ecological Brain DTP (ecologicalbrain. org). His research focuses on how to design conversational interfaces to support human cognition when performing complex data analysis and decision-making tasks.