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Interactive comment on "How can geologic decision making under uncertainty be improved?" *by* Cristina G. Wilson et al.

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In the manuscript with the title "How can geologic decision making under uncertainty be improved?", the authors present an overview of the state of the art of decision making and the three main forms of bias, which are typical in geological investigations. In addition, the authors describe approaches to optimise decision making based on debiasing methods using "digital nudging" approaches. The manuscript is an important contribution to the topic of uncertainty estimation in geological studies and well suited for publication in Solid Earth.

The first part of the manuscript addresses availability, framing, and anchoring bias as common forms of bias in our field. This information is mostly a review of existing work,

but an important compilation on the topic, including recent references and placing them in the geological context.

Very interesting is also the section on debiasing strategies and on the question of methods to teach decision making (in a geological context).

The second part of the manuscript is then focussed on two case studies on the combination of "AI" with human interpretations in order to improve decision making. In this part, I have some problems in following the argumentation of the authors. I understand that any help with reducing cognitive overloading ("busy editor") can potentially help. But especially in the first case, I do not quite see how an automated sampling strategy can help here. For sure, an optimised sampling is interesting in itself - but how does this address the three forms of bias presented above, as opposed to a pure random sampling or the commonly used regular flight paths (option "C" in Fig. 4)? The only added benefit I see (maybe because this is a simplified example) is the reduced time of sampling. Even more: couldn't one also argue that any form of "AI" is prone to introducing additional bias, as it is based on an underlying algorithm that may also be biased? Also, you argue in line 13 (pg. 19) that the expert (user) should retain the ability to interact and adjust the flight path - but wouldn't this then again be prone to the biases described before?

The aspect of fault interpretations in seismic data, explained in case study 2, is more obvious to me - although here the question could also be how much bias is in the initial choice of a fault displacement model (which can be based on physical principles, but the potential interactions can also quickly become very complex when considering fault networks, relay structures, etc.). But here, the point of flagging potential areas of problems is an interesting aspect of "digital nudging" (if I understand it correctly), and similar to the example from Polson and Curtis (2010) and the "bias warning" point in the expert decision-making process.

In summary, even with my (minor) comments on the case studies above, where some

clarification could be beneficial, the manuscript has many very interesting and thought-provoking sections that add important aspects to the discussion on uncertainties in geosciences and I am looking forward to seeing it published.

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