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Discussions

Interactive comment on "Volcanoes in video games: The portrayal of volcanoes in Commercial-Off-The-Shelf (COTS) video games and their learning potential" *by* Edward George McGowan and Jazmin Paris Scarlett

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Dear authors and editor(s),

I am submitting this unsolicited review as I came upon this pre-print on twitter and immediately gave it a read. The topic is very exciting, and I think this paper will make an important contribution to the literature. I had some thoughts while reading the paper and wanted to suggest some ideas in case the authors feel they will improve the manuscript.

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Discussion paper

1. More substantive data analysis. I realize that constructing a quantitative analysis is difficult in this context, but I think some more data could be gathered and used as a statistical showcase of the state of the representation of volcanoes in COTS. For example, without needing to do a full review of more games, the authors could comb through other COTS and create a database of games including their title, release date, genre/style, and importantly, which volcanic features are represented. Perhaps an accuracy score (say, 1-5 with 5 being most accurate, as deemed so by the authors) could also be tabulated for each feature, but this may be too subjective. In any event, I would have loved to have seen, for example, a histogram of the number of occurrences of volcanic edifices, lava flows (active), lava flows (lithified), ash fall, ash deposits, PDCs, lahars, etc. Even if this doesn't reflect the actual abundances of these features in all games, it would still illustrate the abundances of these features within the games studied. It would be simple to add more games to this list that would not require full reviews, such as Star Wars Battlefront, No Man's Sky, DOOM, even as far back as Super Mario (with pits of lava contained within castles). This effort could probably also be crowdsourced!

Also, what portion of the total number of COTS is this representing? Surely the authors cannot play every game, but is there a way to estimate the proportion of volcano-bearing games to the total number of games? How about based on genre? (e.g., 15% of action adventure games contain volcanic features, whereas only 2% of racing games).

These are just example ideas, my point being that I think more of this type of analysis could help the paper to contextualize the study within the broader subject of COTS.

2. Direct comparison of video game features to real world features. The authors do a nice job of describing some of the accurate features showcased in COTS, but I think this could be explored slightly further. For example, I would suggest a figure with real pahoehoe lava flows compared to in-game pahoehoe flows. The non-volcanologist reader of this work I think would benefit from seeing how these in-game features com-

pare to real life.

3. Limitations and advocacy for realism in games The authors allude several times to the limitations of making volcanic features realistic in video games. It got me thinking about the perspective of game developers. Is there a conversation to be had here on how and why decisions regarding the realism of volcanic features in COTS are made from a development perspective? While this is perhaps beyond the scope of the article. But, since it seems the authors have given some thought to the give and take of creating realistic and engaging video games, I'm curious to know where the authors stand. Do the authors advocate for more realism? The same amount of realism? Are there specific pitfalls developers should avoid? Which inaccuracies are the most harmful, and which are perhaps fine to exaggerate for story purposes?

Overall, I think this paper is a very nice contribution to the literature and congratulate the authors on a nicely put together manuscript. Thanks for the opportunity to chime in, despite the fact that no one asked me to! I hope the comments are well received.

Very best, Kayla Iacovino

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