Adaptive and Generative Tasks in Citizen Science Games

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Participant engagement is critical for citizen science projects. Thus, some projects have been structured as online video games, or citizen science games, where participants help solve puzzle-like tasks. These include the biochemistry game Foldit (Cooper 2010). We are interested in two approaches for further improving engagement in citizen science games via the tasks they give to participants to complete: *adaptive ordering* and *generative transformations*.

Task ordering that is adaptive to individual participants. While the tasks themselves in citizen science games may generally be set in advance, the order in which they are given to participants provides some flexibility. We have done some work showing that by adaptively ordering tasks based on participants' performance, using common matchmaking systems, it may help improve both the number and difficulty of tasks completed (Sarkar et al. 2017). We have deployed such an approach in a live game (Stoneman et al. 2022). We are interested in exploring other applications of task ordering and applying other approaches such as reinforcement learning (Spatharioti et al., 2021).

Using generative approaches to transform tasks. We have found some indication that players may find comparable generated synthetic tasks more enjoyable than tasks derived from real-world problems (Dean et al. 2015). Thus, we are interested in further exploring if this is the case, and if so, what are the properties that make certain tasks more enjoyable. Then, is it possible to take tasks derived from real-world problems and modify them in a way that makes them more enjoyable, but maintains their solution. Perhaps this could be done by partially merging them with generated tasks. We have begun some work on constraint-based generation of graph structures (Cooper 2023), which may lend itself to such an approach.

References

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