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# Magellan: Guided MCTS for Latent Space Exploration and Novelty Generation

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## 1 Reproducibility Statement

2 **Reproducing the Final Experimental Results** To ensure full reproducibility of our findings, our  
3 materials provided in the 'code/' folder contains all necessary components. Specifically, it includes:  
4 (1) Source Code: The complete source code for the Magellan framework and all evaluation scripts.  
5 (2) Data: The data required to replicate our experiments, including the identifiers for the knowledge  
6 corpus and the test set of themes. (3) Configuration: Configuration files detailing all hyperparameters  
7 and a requirements.txt file for the software environment.

8 **Reproducing the AI-driven Discovery Process** The primary goal of this supplementary package is  
9 to make the agent-driven research process transparent, understandable, and conceptually reproducible.  
10 **Transparency:** The AgentChatLog/ directory provides a complete, step-by-step record of the  
11 prompts, agent outputs, and intermediate artifacts. This serves as a "lab notebook" for the AI's work.  
12 **Conceptual Reproducibility:** While the stochastic nature of large language models means that  
13 identical outputs cannot be guaranteed, another researcher can follow the dialogues to understand  
14 the methodology. By using similar prompts and guidance, one could reasonably expect to guide a  
15 comparable AI agent to a similar set of ideas, code, and scientific conclusions. The logs document  
16 the critical path of inquiry, including dead ends, refinements, and breakthroughs. We believe this  
17 detailed record is essential for evaluating the methodology of using agents in science and provides a  
18 strong foundation for other researchers to build upon our approach.

## 19 Responsible AI Statement

20 Magellan is designed to augment human creativity and accelerate scientific discovery. We recognize  
21 that any powerful generative tool carries risks, such as generating plausible-sounding misinformation  
22 or amplifying biases from its training data. Therefore, we strongly assert that Magellan is a tool  
23 for assisting experts, not a replacement for them. Human oversight and expert validation of all  
24 outputs are the most critical safety measures for its responsible deployment. Our framework's design  
25 incorporates further precautions by grounding the search in a peer-reviewed knowledge corpus and by  
26 providing full transparency through our open-source code. We believe that when used under expert  
27 supervision, Magellan can serve as a safe and powerful partner for innovation.