

# Weighted Prompt Engineering: Helpful or Hinderling?

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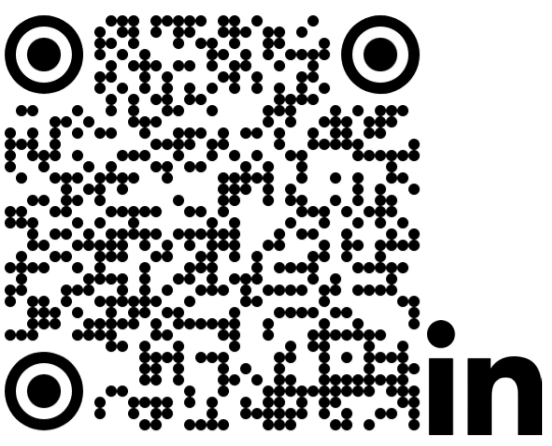
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# Weighted Prompt Engineering: Helpful or Hinderling?

THE EFFECTS OF WEIGHTED PROMPT ENGINEERING ON THE CREATIVITY OF TEXT-TO-IMAGE GENERATION

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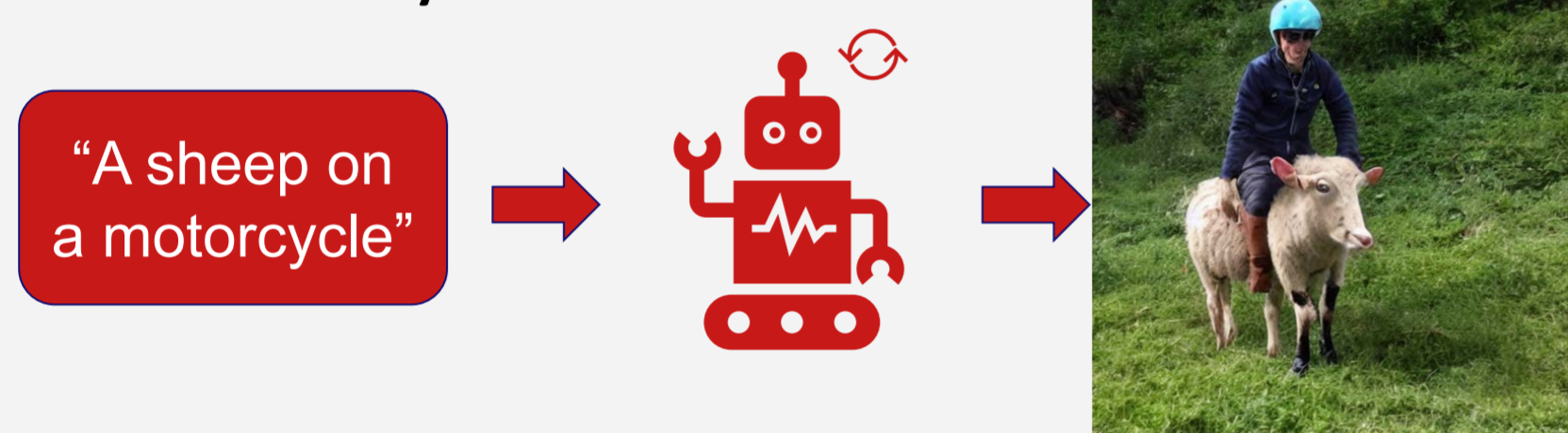
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## INTRODUCTION

- Increasing creativity in design and engineering may potentially lead to better solutions and processes
- Text-to-Image models can create images from a text prompt, but this does not always go as expected
- Gap between the user's intention and the system's output<sup>1</sup>
- Adding control methods can increase self-expression and, in turn perceived creativity<sup>2</sup>

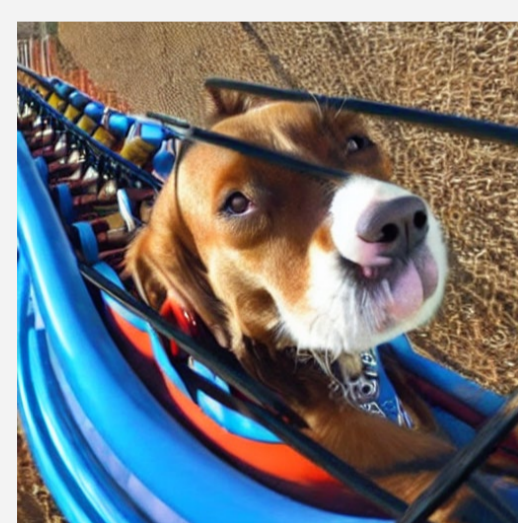
## HYPOTHESIS

→ Adding a control method to the image generation process leads to higher perceived creativity



## POSSIBLE SOLUTION

Weighted Prompt Engineering



Dog in a roller coaster



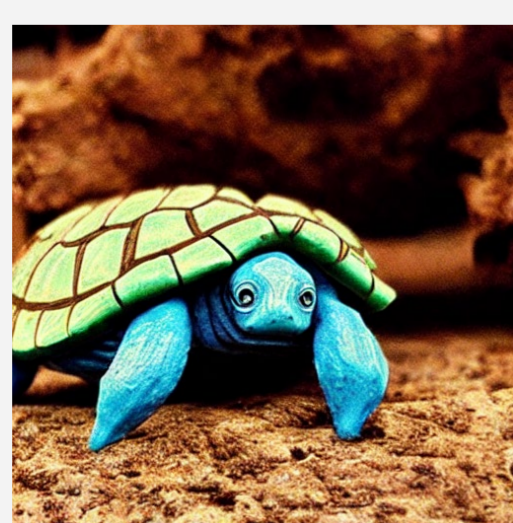
Dog:0.30 in a roller coaster0.70

## METHOD

- 44 participants generated 8 images using both unweighted (standard) and weighted (new) prompt engineering
- Participants rated the images' perceived creativity, self-expression, value, novelty, and surprise<sup>3</sup> on a 7-pt. scale, followed by an interview



Monster city:0.60 in water:0.40



blue:0.40 turtle:0.60

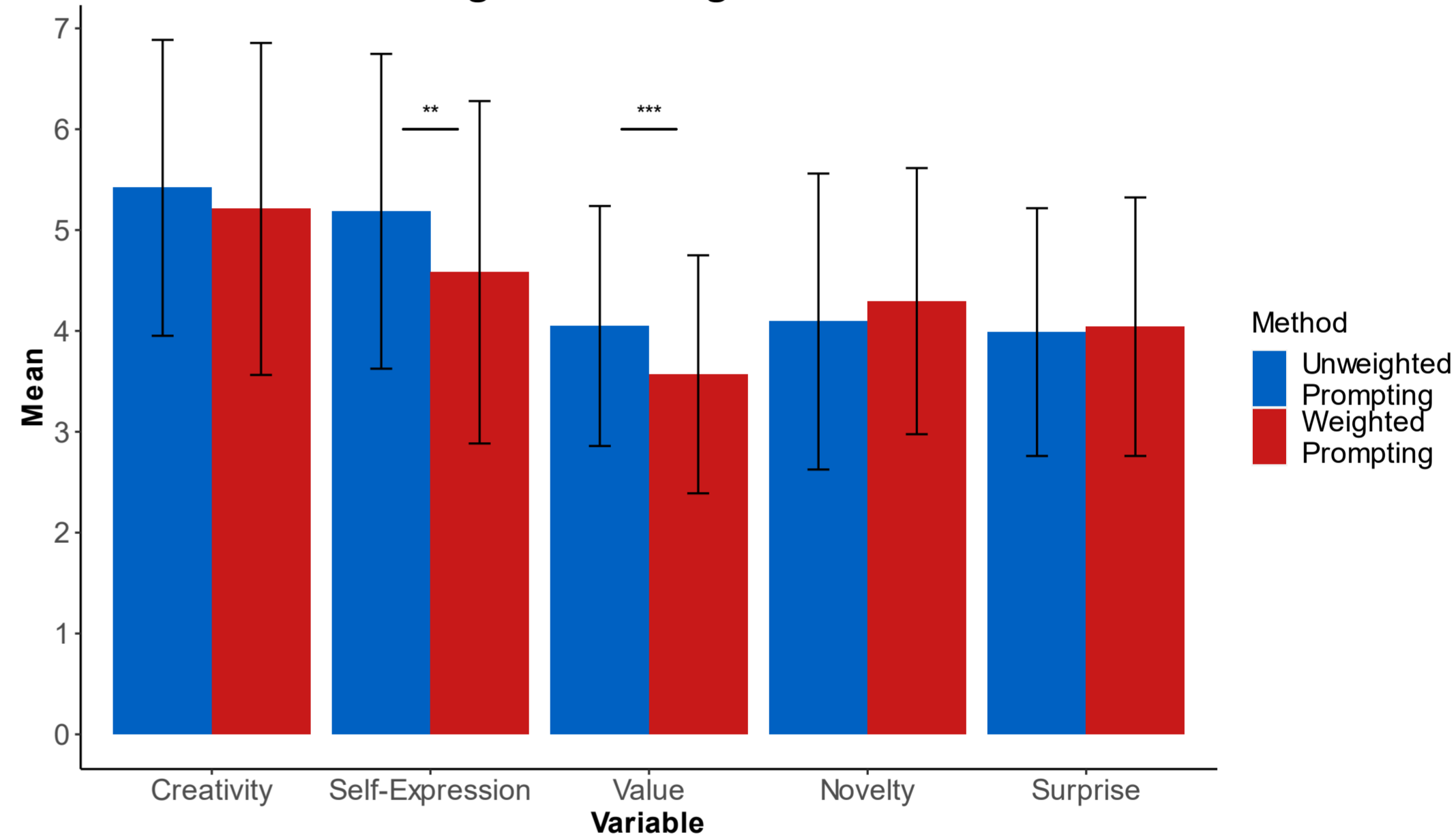


A sunflower field by sunset

## RESULTS

- Scores for creativity, self-expression, and value decrease when going from unweighted to weighted prompt engineering
- Scores for novelty and surprise are higher for weighted prompt engineering compared to unweighted prompt engineering

Variable Scores during Text-to-Image Generation



- Participants didn't like adding numbers to text
  - "Using weights lays more emphasis on the weights instead of processing your ideas"
  - "Not using numbers doesn't break my flow of thought"
  - "Thinking in numbers limited me coming up with new ideas"
- Participants felt like they had higher expectations using the Weighted Prompt Engineering method
  - "I'd be more disappointed in weighted going wrong than unweighted"
  - "When using the weighted, I noticed that I really wanted or expected what I asked for"
  - "Weighted was also frustrating because I did not get what I asked for"

## CONCLUSION

- Weighted Prompt Engineering **decreases** self-expression but does not have a significant effect on creativity
- Weighted Prompt Engineering seems to make the images more likely to be perceived as novel or surprising, but not enough evidence was found to confirm this
- Based on this data, Weighted Prompt Engineering seems to be a less promising method to increase creativity and other methods, e.g. a 'troublemaker' should be explored

## BUILT ENVIRONMENT / STRUCTURAL ENGINEERING AND DESIGN

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