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BIO 5100

**Analyzing Sea Lion Aquatic Turning Performance Using AI Generated R Code**

The ultimate goal of this case study was to prompt both ChatGPT and Bing Copilot to generate an R code that not only recreated turning rate and radius results from data used in Leahy et al., (2021), but that also calculated all the other turning parameters (turning velocity, centripetal acceleration, and g-force of the turn) analyzed in that paper. I used prompting syntax suggestions from several references to create a specific prompt that would, ideally, provide no errors or require any user editing of the code provided from ChatGPT or Copilot (Liu et al., 2024; Merow et al., 2023; Perkel, 2023).

Through several iterations of the prompt (specifying only one value to be output for each variable through the entirety of the turn, breaking the request down into smaller tasks, and asking the AI platforms to explain what each section of the code did to try and see where the math was incorrect), I was able to prompt both platforms to produce \*functional code\*, however, none of the code provided functioned “correctly”. Many of the output values for each of the turning parameters were outrageously small (turning radius of 0.04m) or outrageously large (g-force of 12.78 g).

Surprisingly, the code ChatGPT provided never threw any errors in R. The same is not true of Copilot. Copilot started out strong and because the initial descriptions of the Copilot’s R code used equations found in relevant literature (Leahy et al., 2021; Cheneval et al., 2007; Fish et al., 2003), I was confident Copilot would outperform ChatGPT. However, as I continued to tweak my prompts, Copilot threw more and more errors or “NA” answers and Copilot did not maneuver around error handling as well as ChatGPT. Overall, I was not able to prompt ChatGPT or Bing Copilot to properly recreate code that provided the desired results.

References

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