Determining Ari Velocity with an LLM Bot and Camera

Ozobot Editor Challenge—Student Guide

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In this challenge you will be presented with a series of images each containing two photos of Ari following a line on a meter long tape. An example is shown in Figure 1. The top photo is always taken before the bottom photo. Distance between vertical marks on the tape is in centimeters. Information in light gray at the bottom of the image tells you the line-following speed as well as the time between photos. By the way, the photos were taken with an iPhone mounted on a tripod and using an iOS app called **SelfTimer**. This app is pretty cool as you can set the time between photos from 1 to 120 seconds.

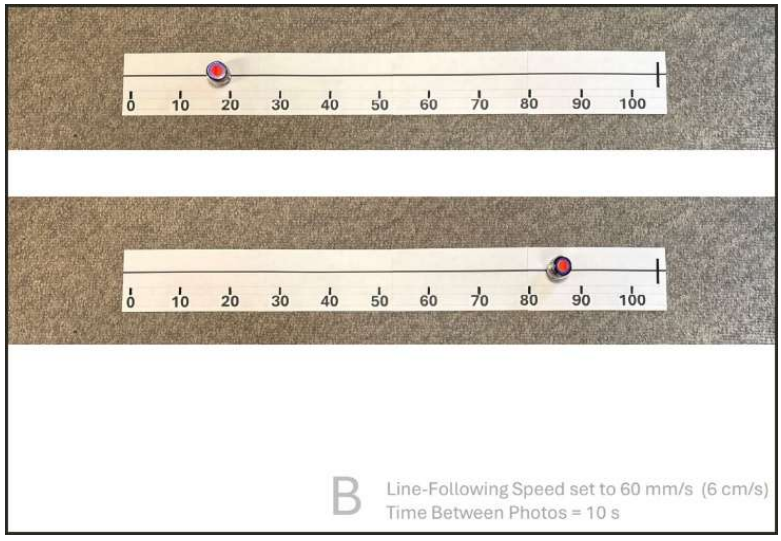

Figure 1

Task #1

With an LLM bot and camera connected in the Ozobot Editor, take a snapshot of the two photos, but do not include the information in gray at the bottom of the image in the snapshot. **Make certain that you are using the Open AI (Standard) LLM model**, as it is the best model available for purposes of this challenge.

Making use of the LLM prompt block with the camera, as well as the time between photos indicated in the prompt, come up with appropriate prompt wording that will allow the LLM model to determine and return the speed of Ari in cm/s. How does

LLM's predicted speed compare to the line-following speed given in gray? Don't expect perfect agreement—20% off is reasonable. What do you think could be some of the reasons for the disagreement?

Task #2

In this second challenge task, you are interested in the LLM responding only with the velocity of Ari, and not a detailed explanation of how it determined Ari's velocity. If you are getting a detailed explanation, you will need to add something similar to this at the end of the dialog in the prompt: *Please respond only with a number*.

Now, you want to connect either Ari or Evo to the Ozobot Editor. It is more fun to use Ari, as Ari can display information and get user responses with its color touch display. With Evo, all interaction will be on the Ozobot Editor Terminal. In the remaining discussion, we will assume that it is Ari that you are using.

The goal here is to have Ari move along a larger copy of the Ozomap shown in Figure 2 and stop at the location that corresponds to the velocity returned by the LLM.

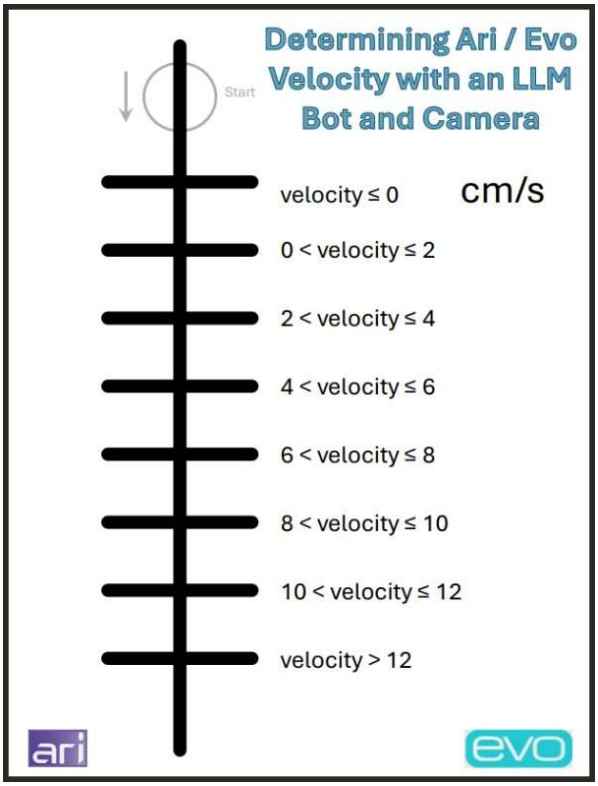

Figure 2

Further, once Ari has stopped at the correct location, its display should look like that shown to the left in Figure 3. After the user taps OK on the screen, then the screen should look similar to that shown to the right in Figure 3. The speed in cm/s will show for a couple of seconds and then the program will end.

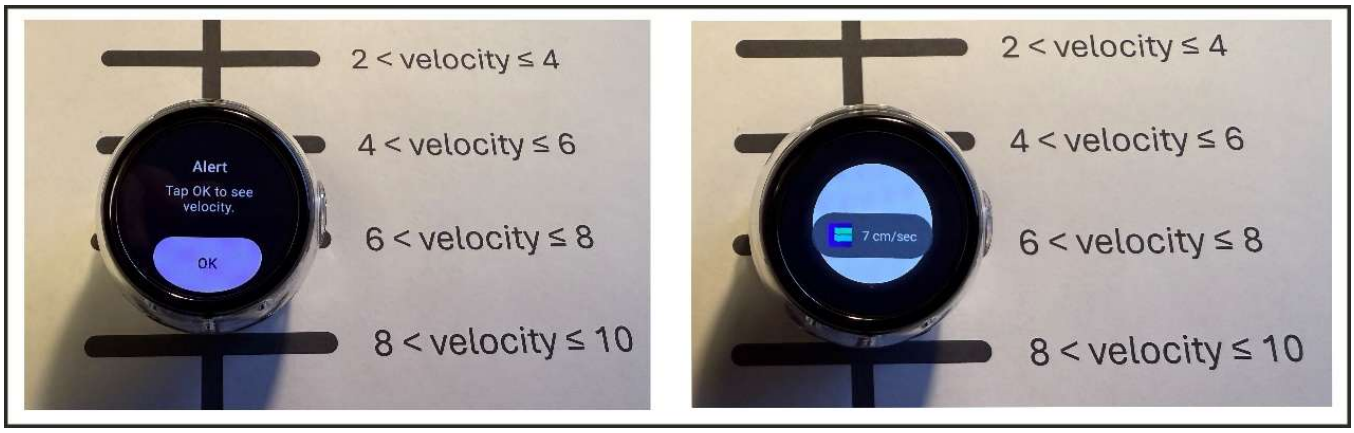

Figure 3

Remember that velocity is negative if Ozobot is moving to the left from the first to the second photo. The final requirement for this challenge is for Ari to display a red top light while moving if the velocity is negative and a green top light if the velocity is positive.

And of course, your program should work flawlessly on all six of the photo pairs A, B, C, D, E, and F of images, with the only change being to adjust the time between photos in the LLM prompt.

The challenge is all yours now. Good luck and enjoy the journey!