Reinforcement Learning with AWS DeepRacer

Lab overview

AWS DeepRacer is a machine learning (ML) program that uses reinforcement learning. In this lab, you will create and evaluate a model for a virtual car to learn how to drive on a track.

Duration

This lab requires approximately 40 minutes to complete.

Access the AWS Management Console

- 1. To start the lab session, choose Start Lab in the upper-right corner of the page.
 - The lab session starts.
 - A timer displays at the top of this page and shows the time remaining in the session.
 Tip: To refresh the session length at any time, choose Start Lab again before the timer reaches 0:00.
- 2. Before continuing, wait until the lab environment is ready. The environment is ready when the lab details appear on the right side of the page and the circle icon next to the AWS link in the upper-left corner turns green.
- 3. To return to these instructions, choose the Readme link in the upper-right corner.
- 4. To connect to the AWS Management Console, choose the AWS link in the upper-left corner, above the terminal window. A new browser tab opens and connects you to the AWS Management Console. Tip: If a new browser tab does not open, a banner or icon is usually at the top of your browser with the message that your browser is preventing the site from opening pop-up windows. Choose the banner or icon, and then choose Allow pop-ups. Note: You are using the console through the lab environment, so you are not incurring any actual costs. However, in the real world, when using a personal or business account to access the console, users incur charges for use of specific AWS services.

Task 1: Create a model

- 4. Choose the Services menu, locate the Machine Learning category, and choose AWS DeepRacer
- 5. Choose Create model.
- 6. In the Step 1 section, choose Start the course.

- 7. Read through all parts of the AWS DeepRacer Guide.
- 8. When you are finished, choose Create model.
- 9. On the Step 1 page, configure the following:
 - In the Training details section, for Model name, enter a name for your model.
 - In the Environment simulation section, choose the re:Invent 2018 track.
 Note: If you do not see the re:Invent 2018 track in the list, choose View more race tracks.
 - At the bottom of the page, choose Next.
- 10. On the Step 2 page, configure the following:
 - Race type: Choose Time trial, which is the default.
 - Training algorithm and hyperparameters: Choose PPO, which is the default.
 - Choose Next.
- 11. On the Step 3 page, configure the following:
 - Read the information about action space.
 - In the Select action space section, for Action spaces, choose Continuous action space, which is the default.
 - Choose Next.
- 12. On the Step 4 page, accept the default vehicle (The Original DeepRacer), and choose Next.
- 13. On the Step 5 page, configure the following:
 - In the Automatically submit... section, clear the Submit this model... option.
 - Read and acknowledge the Terms and conditions.
 - Select your Country of residence.
 - Choose Create model.
- 14. A pop-up window displays a message indicating that training is being initialized. This will take a few minutes. While you wait, explore some of the learning opportunities presented in the pop-up window. Then, choose the X in the top right corner to close the pop-up window. A banner at the top of the page first displays the status Initializing training. Then, the status changes to Training in progress. Once the training is in progress, a live simulation video displays in the Training section. When the video appears, move to the next task.
- 15. Choose the play icon to watch the video. Let the training run for at least 10 minutes to generate enough data to evaluate the simulation. A timer in the lower-left corner of the Training section indicates how long the training has run.
- 16. After at least 10 minutes, choose Stop training at the top of the page.
- When prompted to confirm that you want to stop the training, choose Stop training. It takes a few minutes for the training to end. When it has ended, the Training section displays Completed. Move to the next task.

Task 2: Evaluate the simulation

- 17. After the training ends, in the Evaluation section, choose Start evaluation and configure the following:
 - In the Race type section, for Evaluation name, enter a name for your evaluation.
 - Race type: Choose Time trial.
 - Choose the re:Invent 2018 track.
 - In the Virtual race submission section, clear the Submit model... option.
 - Read and acknowledge the Terms and conditions.
 - Select your Country of residence.
 - Choose Start evaluation.
- 18. The evaluation will take several minutes to complete. After it completes, a summary displays and provides information about how the simulation performed on the selected track.
- 19. (Optional) If you have time remaining, try another evaluation. Repeat the previous steps but choose a different model or track. Compare the results.

Lab complete

Congratulations! You have completed the lab.

- 19. Log out of the AWS Management Console.
- In the upper-right corner of the page, choose your user name. Your user name begins with voclabs/user.
- Choose Sign Out.
- 20. Choose End Lab at the top of this page, and then choose Yes to confirm that you want to end the lab.