AWS DeepRacer Sensor Kit

Getting Started Guide

The AWS Sensor Kit is intended for use only with the AWS DeepRacer

Getting started guide

Get rolling in approximately 15-20 minutes

Contents

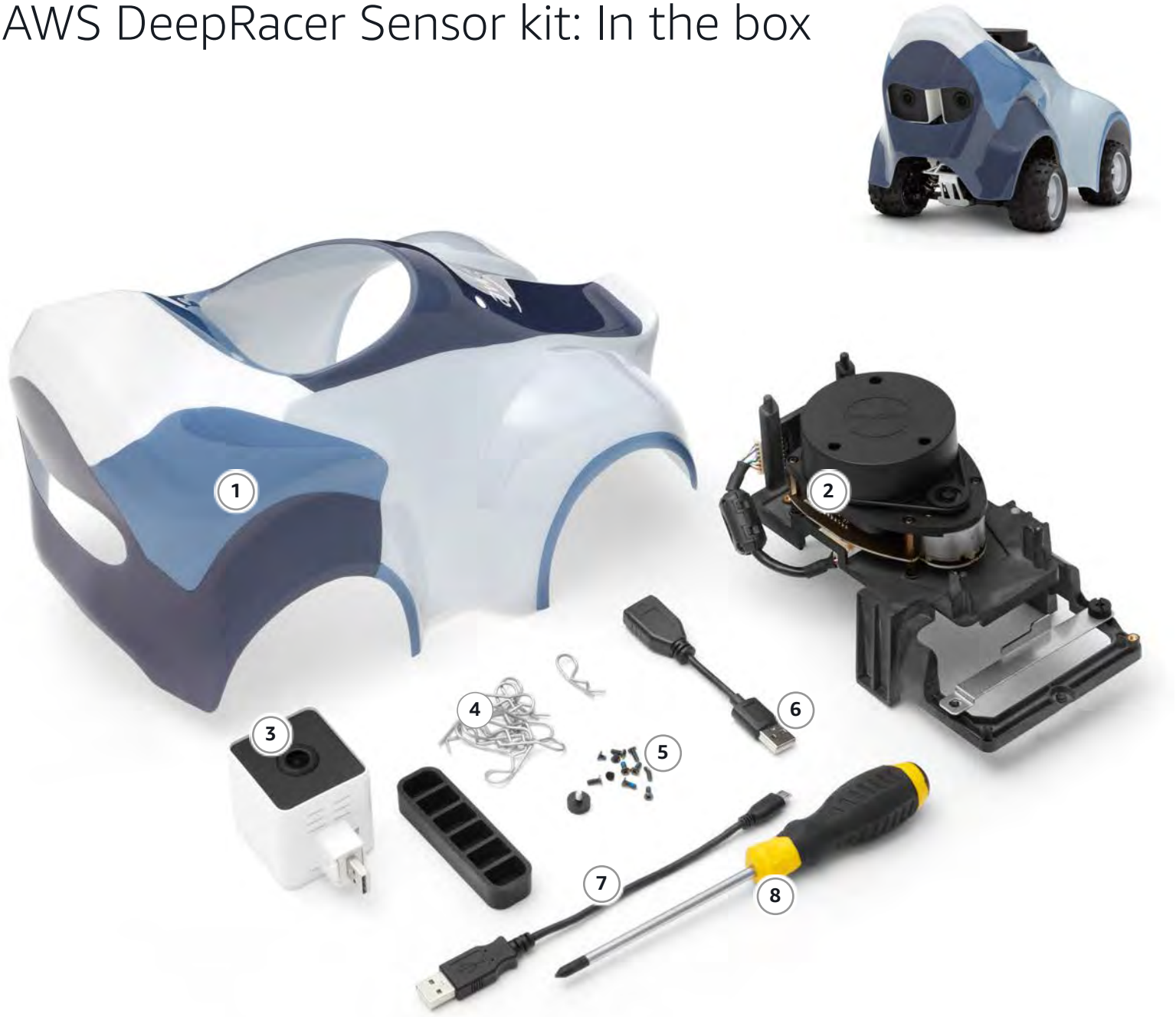
⚠ If you use macOS Catalina or later (10.15.5 +):

You will need a USB drive the first time you connect your vehicle to W-Fi. After you connect and your vehicle's software updates, you can set up connections to new Wi-Fi networks using the USB cable in the box.

How to use a USB Flash Drive to Connect your AWS DeepRacer

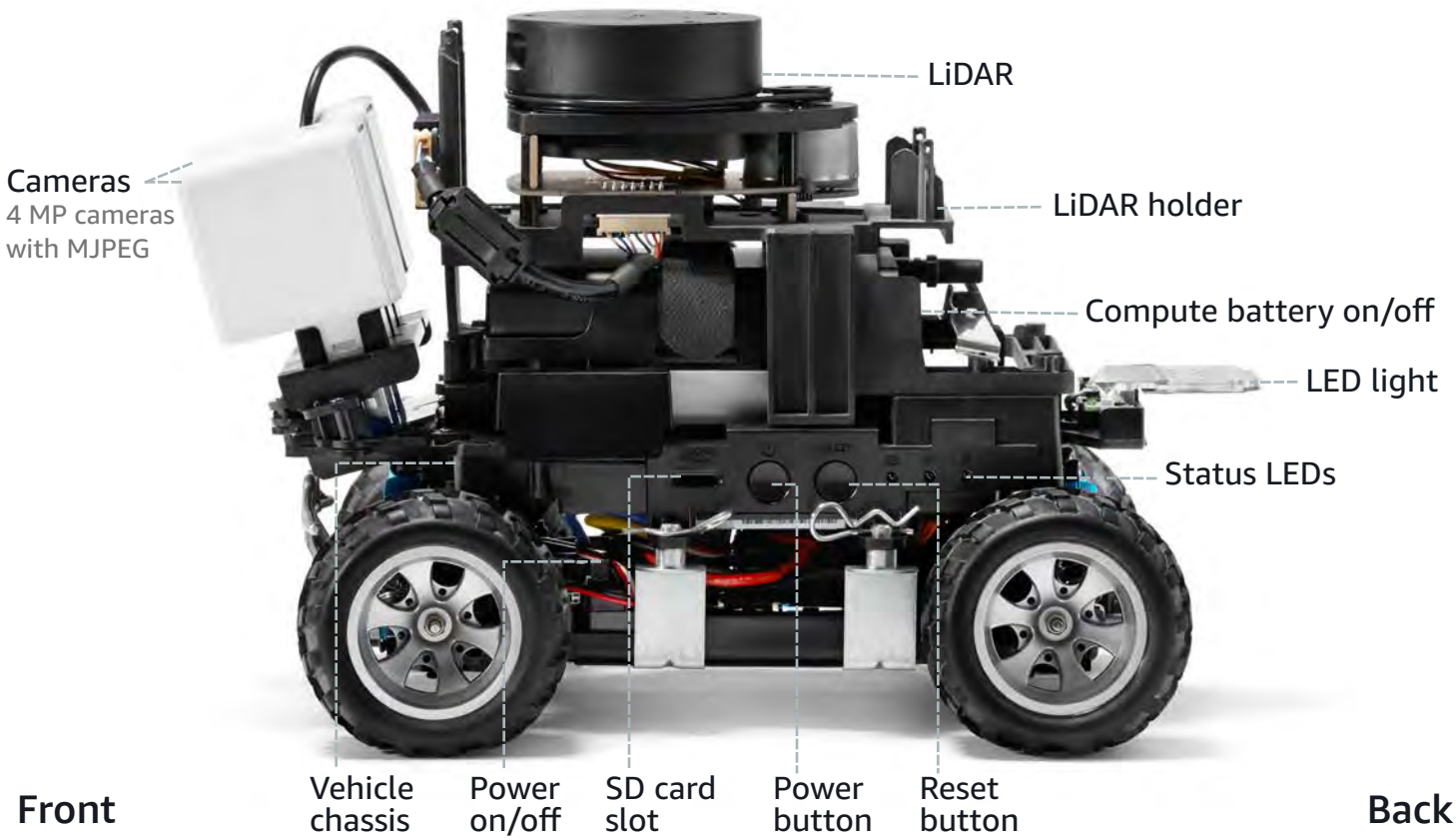
Use a Firefox browser to connect to deepracer.aws or the device's wireless IP (Chrome is not supported).

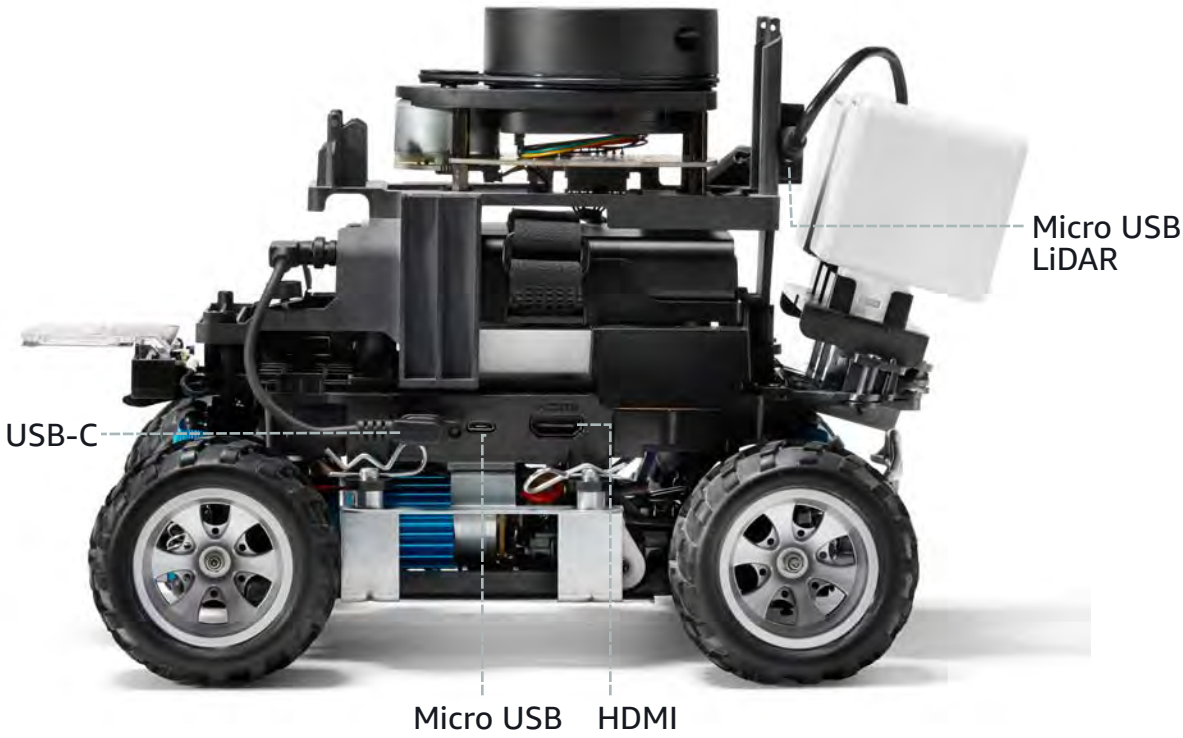
AWS DeepRacer Sensor kit: In the box



1. Vehicle body shell
2. LiDAR
3. Camera
4. Pins
5. LiDAR screws
6. USB-A extender cable
7. LiDAR to USB port connector cable
8. Phillips screwdriver

Assembled vehicle at a glance





Preparation

Gather these items

Next: Install LiDAR sensor

Install sensors

1. Sensor: LiDAR
2. Sensor: Stereo Cameras
3. Reconnect

1. Unpin and remove shell

2. Unscrew shell brackets

3. Uninstall shell brackets

Use the included Phillips screwdriver to unscrew the front and back shell brackets
Note: Save screws to fasten LiDAR

Next: Install LiDAR sensor

Install LiDAR sensor

1. Pull out camera from USB port

Grab the camera module firmly and pull upward to remove it from the USB port.

2. Unplug USB-C cable from compute battery

Note: Dell battery cable is longer

3. Place LiDAR on vehicle chassis

Next: Install LiDAR sensor continued

Install LiDAR sensor

Fasten LiDAR - front and back

4. Fasten front screw

Note: Use screws from shell bracket

5. Fasten back screw

Next: Install LiDAR sensor continued

Install LiDAR sensor

6. Plug USB-A cable in middle USB-A port

USB-A

7. Plug the USB Micro-B cable into the LiDAR

USB Micro-B

Next: Stereo camera

Install Stereo Cameras

Plug camera into the left and right USB-A ports

USB-A

Next: Connect battery

Connect battery

Connect compute battery with USB-C

USB-C

Next: *Connect Dell battery

Connect Dell battery

**ONLY for customers with a Dell compute battery. If you do not have a Dell compute battery, skip these instructions.*

1. Plug cable in Dell compute battery

2. Slide cable under LiDAR frame

3. Wrap cable around base of liDAR

4. Plug in USB-C

Next: Turn on vehicle

Turn on vehicle

1. Turn on compute battery

2. Turn on vehicle compute

Two blue LED lights indicate battery is charged and Wi-Fi connected.
See Tips on page 18-19 for LED behavior.

3. Switch on vehicle

Listen for two short beeps and one long beep

Next: Lights and action!

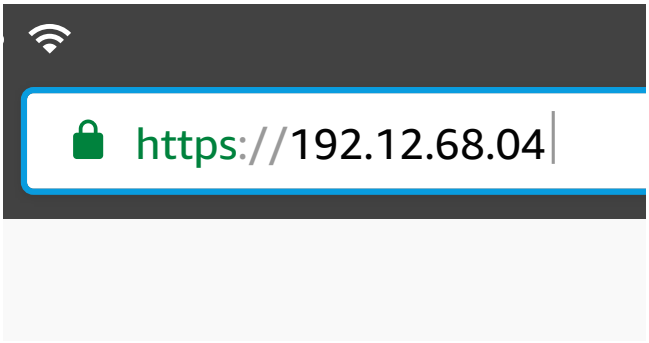
Lights and action!

Check for visual cues that your sensors are ready: Is your LiDAR spinning? Is its LED lit?

Next: Test drive

Test Drive

Use any device with a browser to drive your AWS DeepRacer. Connect your device to the same Wi-Fi network as your AWS DeepRacer.



1. Enter vehicle IP address to access your vehicle on an internet browser

Note: This is an example, not your vehicle IP address. If you do NOT have an IP address go to the **AWS DeepRacer Getting Started Guide**

2. Enter password

Note: Found printed on the bottom of your vehicle

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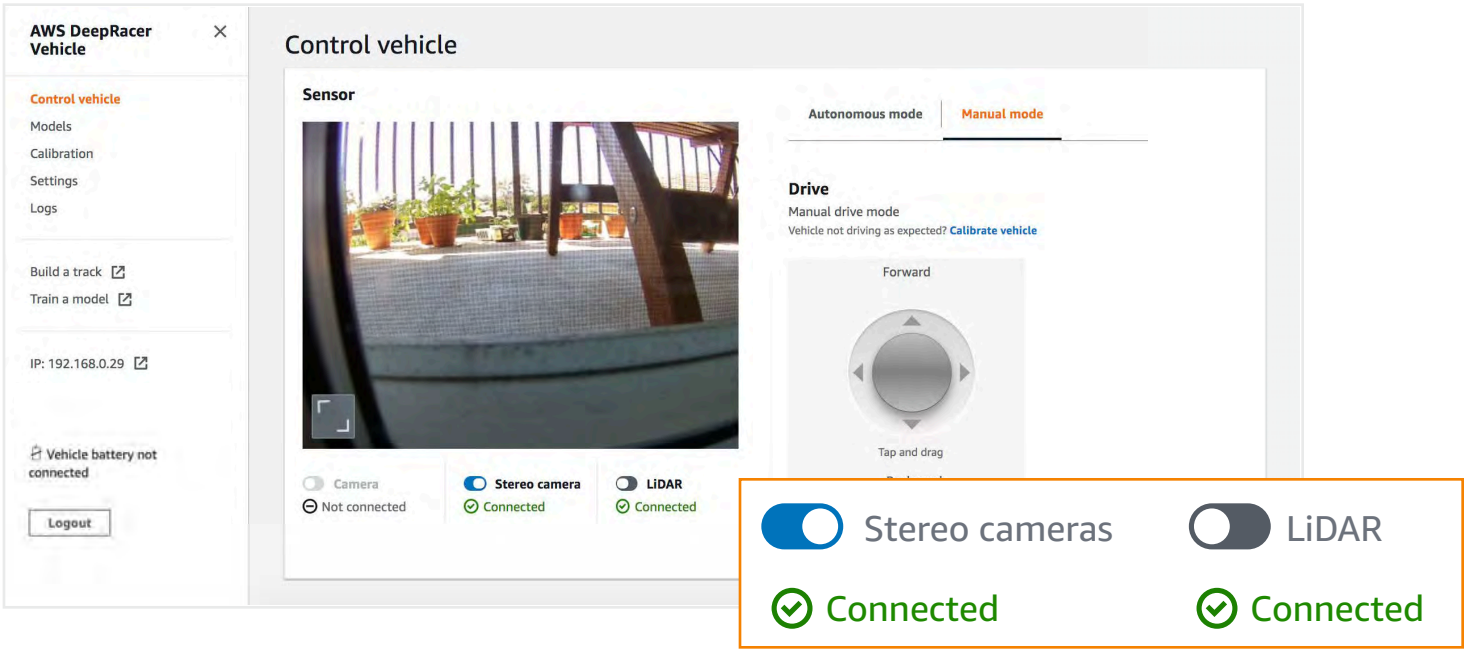
Next: Test drive continued

Test drive

Note: Ensure that the vehicle is switched on.

1. Check the sensors

Look beneath the camera viewfinder to find your sensor connection status. The connection is successful if you see green check marks. The LiDAR view finder is switched off by default. Switch it on to verify that it's connected.



2. Put the vehicle in manual mode

Move the joystick in the forward direction and watch how the vehicle responds. Does the vehicle move in the forward direction?

Next: Test drive continued

Test drive

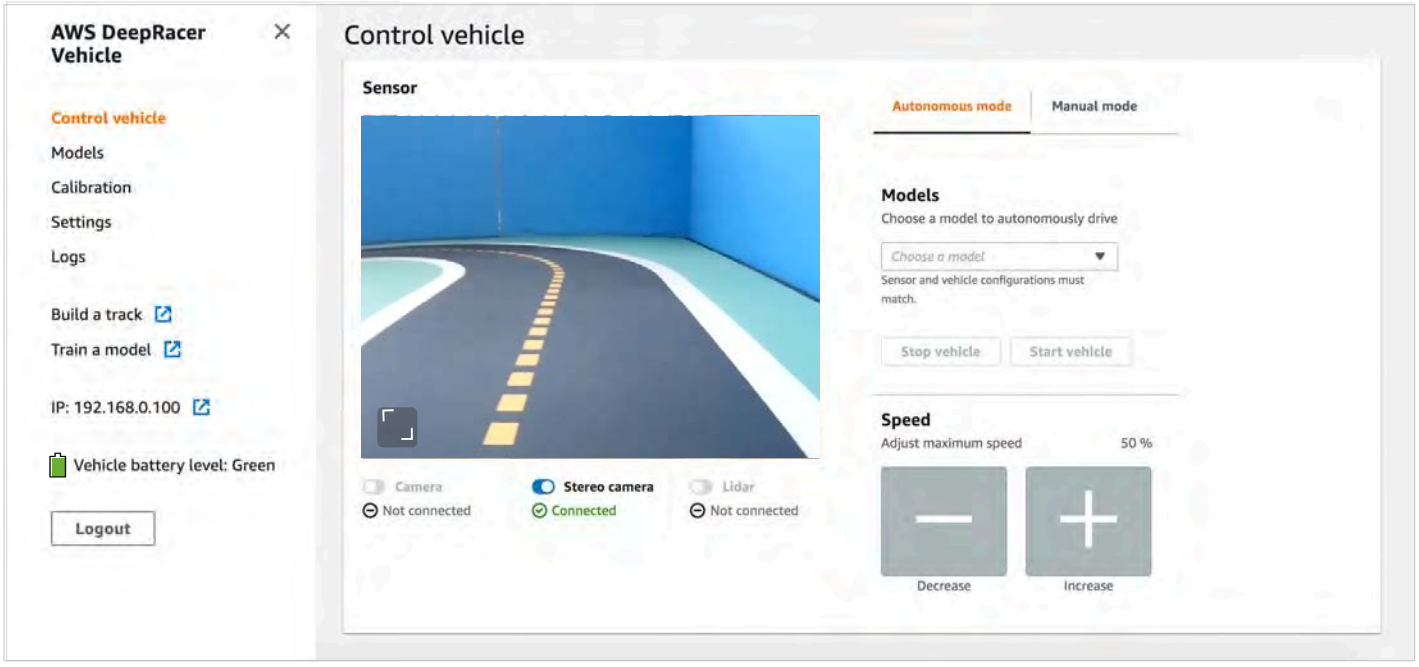
3. Try autonomous mode

1. Choose the **Autonomous driving** mode. Load a sample model using the drop down or load your own trained model.

2. Press **Start vehicle** button

3. Gradually increase the **Maximum speed %** until model begins to move

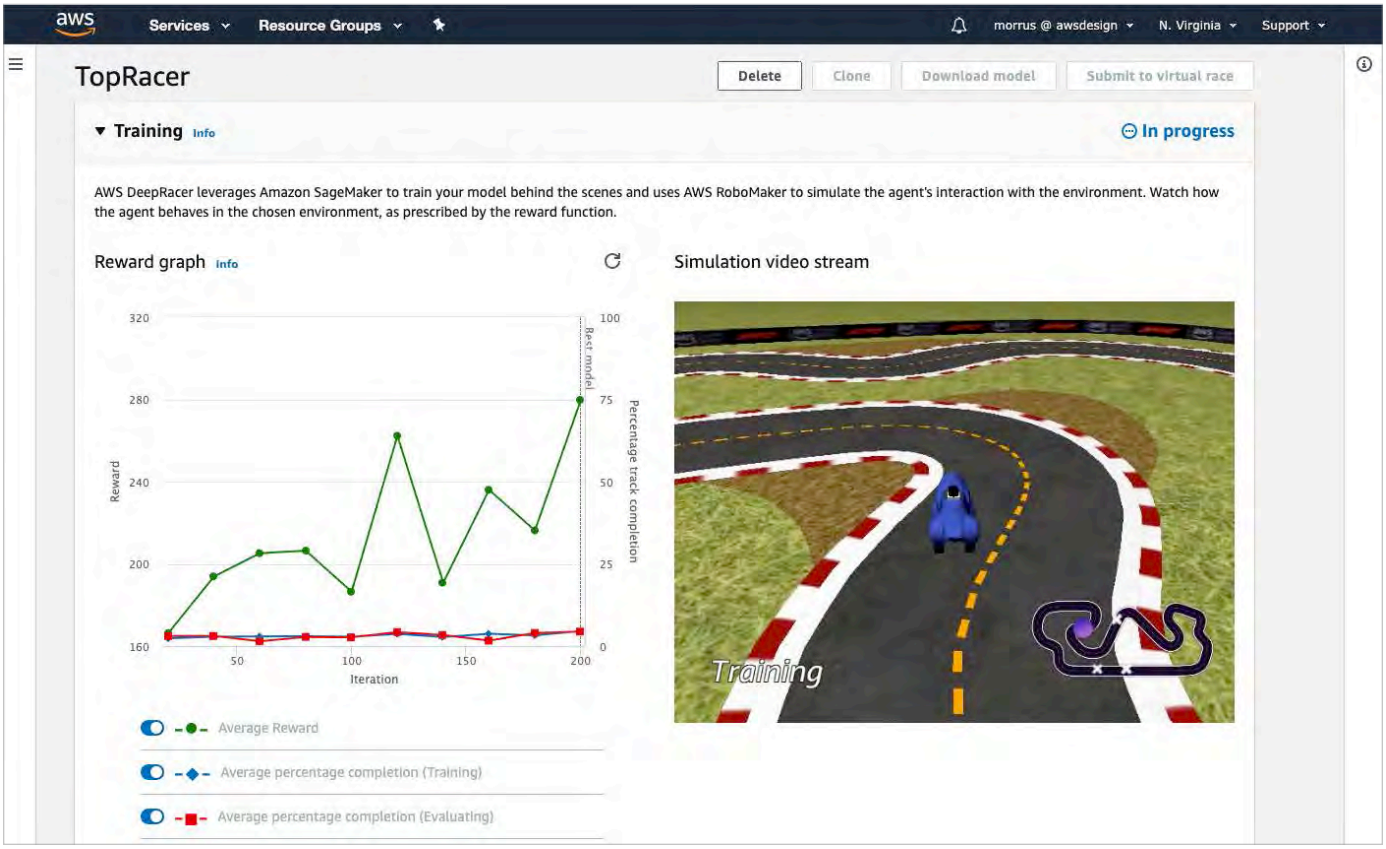
Optimizing a trained model for transfer to a physical AWS DeepRacer vehicle can be a challenging learning process. It requires iterations through trial and error.
For more tips, see **Optimize Training AWS DeepRacer Models for Real Environments**



Next: Drive and experiment

Drive and experiment

Visit https://www.aws.amazon.com/deepracer



Train reinforcement learning (RL) models

Train your own RL models and watch training in simulation. Evaluate models and download models to your AWS DeepRacer to test on tracks.

When loading models on your vehicle make sure the sensor configurations match. Models trained with LiDAR and stereo camera need to run on vehicles with LiDAR and stereo camera.

Next: Race

Race

Join the DeepRacer League

Welcome to the world's first global autonomous racing league, open to anyone.

Summit Circuit: Find a Race

Join the community

DeepRacer forum

DeepRacer Slack channel

DeepRacer Github issues

DeepRacer documentation

Next: Tips

Tips

Understanding LED behavior

Battery LED Guide

- **Solid blue**: Battery charged, application running
- **Blinking blue:** updating software
- **Yellow**: Device booted to OS
- **Blinking Yellow:** Loading BIOS and OS
- **Red**: Error in system when rebooting or starting application

Tips

Understanding LED behavior

Wi-Fi LED Guide

- **Solid blue**: Wi-Fi connected
- **Blinking blue**: Connecting to Wi-Fi
- **Solid red then Off**: Failed to connect to Wi-Fi

  Troubleshooting

  - Check your Wi-Fi network password
  - Public Wi-Fi that requires CAPTCHA-enabled sign-in commonly found in hotels, gyms and cafes is not supported