# Self-Driving Car Engineer

NANODEGREE PROGRAM

Welcome Handbook

Welcome to Day 1 of the Self-Driving Car Engineer Nanodegree program. Enrolling was just the first step. Today, you embark on your journey to join the ranks of some of the world's first self-driving car engineers. Upon completing the program, you'll be on your way to working alongside the forerunners in this exciting new field. To prepare you for success, we've compiled essential information for this digital handbook.

Congratulations on your first day.

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# Meet the Team

# Meet the Team

**Instructors -** David Silver, Ryan Keenan, Drew Gray, Cameron Pittman, Bryan Catanzaro, Axel Gern, Brok Bucholtz, Dominique Luna

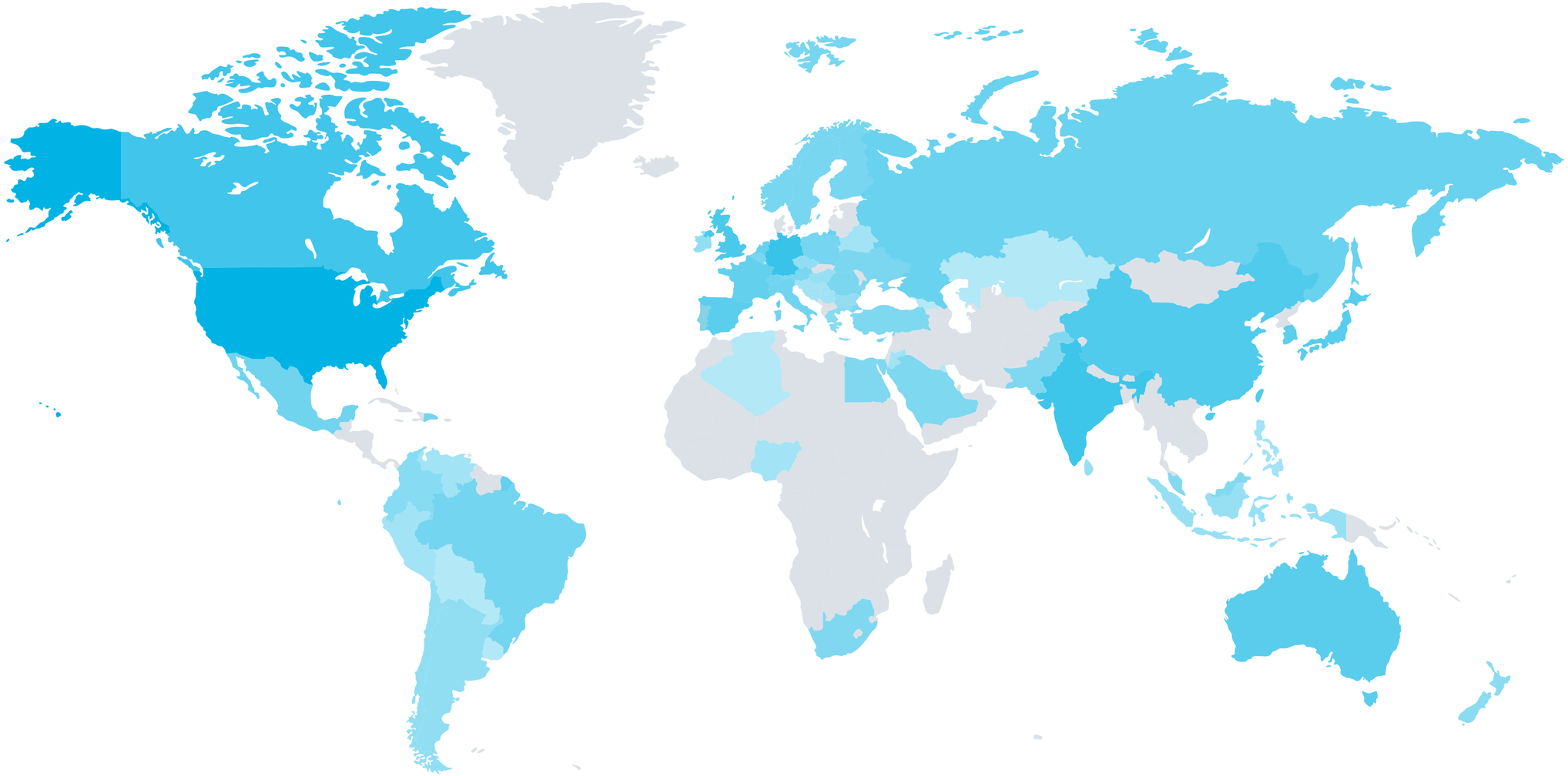
**Services Lead -** Stephen Welch

**Open Source Self-Driving Car Team -** MacCallister Higgins, Eric Gonzalez

**Leads -** Oliver Cameron, Jessica Lulovics

**Community -** Lisbeth Ortega

# Where Our Students Are



# Your Resources

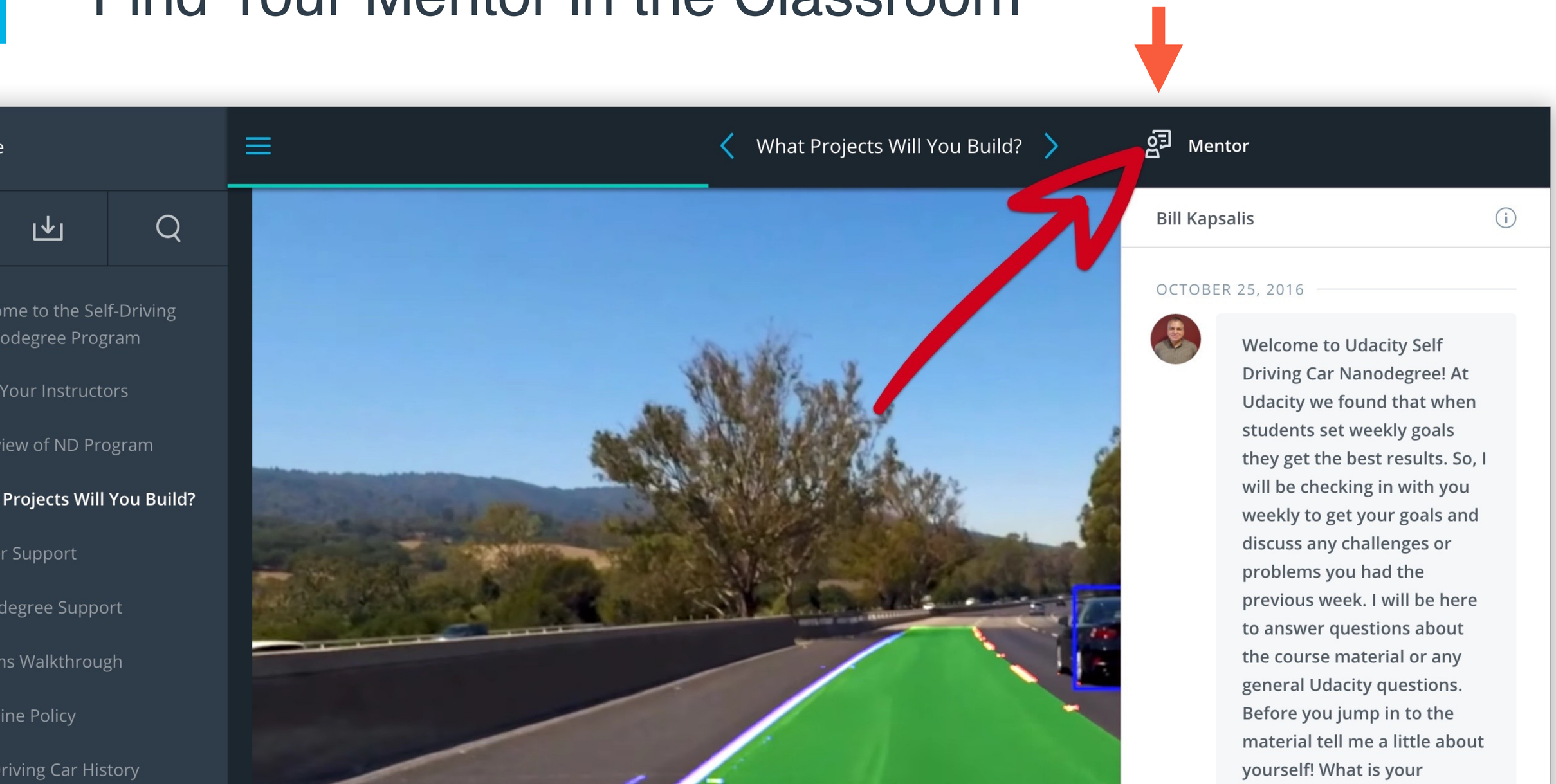
# Your Mentor

Each Self-Driving Car Nanodegree program student gets his or her own personal mentor. This mentor will get to know you, your learning style, and will be able to help you get exactly what you want out of your Nanodegree program.

**With Mentorship you'll be able to:**

- Get help from your mentor without even leaving the classroom
- Receive 1:1 on-demand support via your personal chat channel
- Stay on track through weekly check-ins

# Find Your Mentor in the Classroom

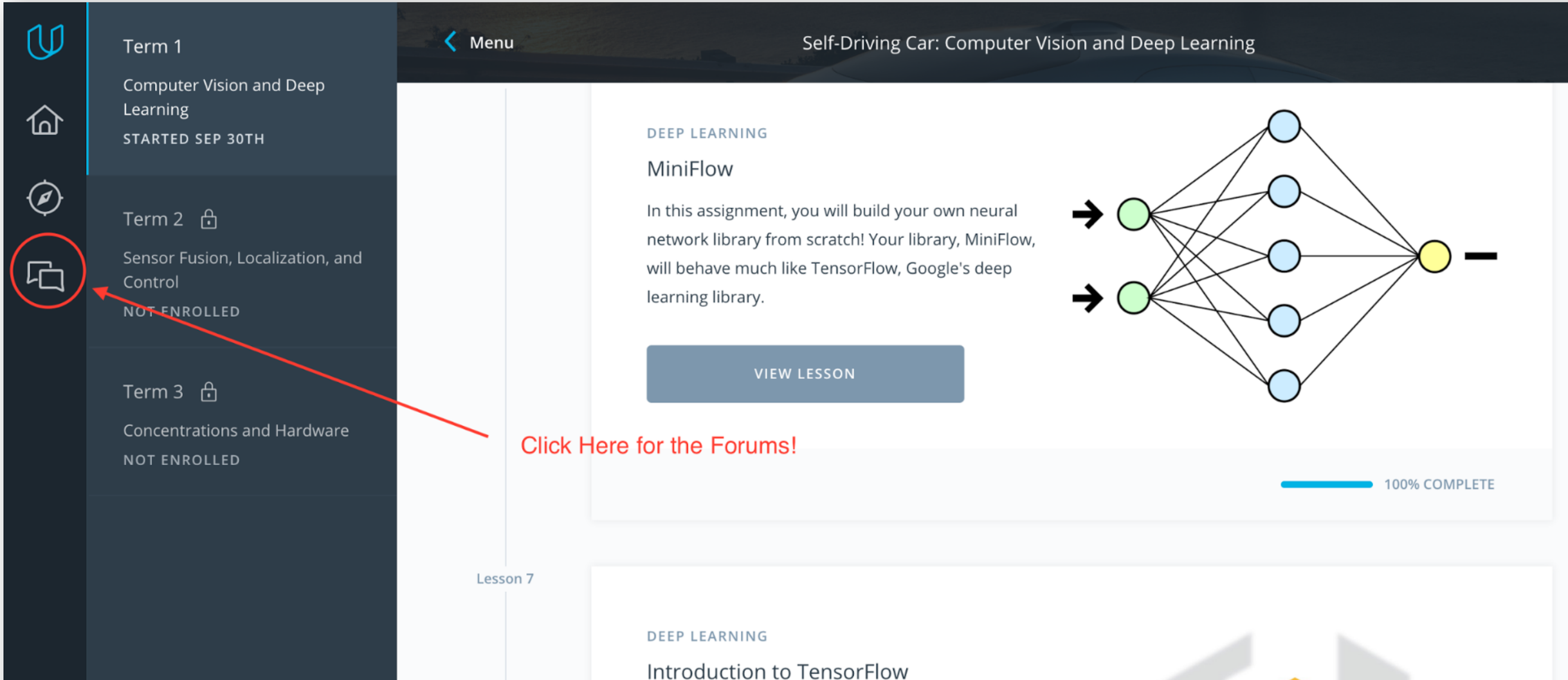


# Forums

In the Self-Driving Car Engineer Nanodegree program, you'll have access to an exclusive forum. In this forum you'll not only be able to talk to other passionate students, but also receive help from our expert Coaches and dedicated staff.

We monitor and respond to an ongoing stream of detailed feedback from student forum participants, and this has allowed us the opportunity to constantly refine, enhance, and upgrade the model. Thanks to your feedback in the forums, we can ensure the Nanodegree program improves over time.

# Find Forums in the Classroom



# Slack

For the first time ever, Udacity students of a single class can interact with each other live via Slack. With a designated private channel for your class, connect directly with students who are online the same time as you: ask questions, exchange ideas, and get to know your fellow classmates.

Join the Slack Team for Self-Driving Car Engineer Nanodegree students. Once you're in, click on Channels, and introduce yourself on the **#introductions** channel!

# Support

If you have specific questions related to course content or projects, please post to the Forums, where peers & forum mentors can help!

If you have questions about the program structure or your enrollment, issues with the classroom, or any other questions or concerns that a Udacity staff member can help with, please reach out at **selfdrivingcar-support@udacity.com**.

# What to Expect

See our full **Self-Driving Car Engineer Nanodegree FAQ** and **general Udacity FAQ**.

# Environment

## TECHNOLOGY REQUIREMENTS

See the technology requirements here.

## SETUP

Our instructors will guide you through setup in the classroom. However, we also created a Starter Kit on Github to make setup even easier.

# Class Timeline **Pacing**

This is a unique, three-term program that requires students to keep pace with their peers throughout the duration of the program. Each term is around 3 months. The entire Nanodegree program takes 9 months to complete.

# Class Timeline **Curriculum**

Read all about the Term 1 curriculum and Term 2 curriculum as detailed by instructor David Silver.

# Class Timeline **Deadlines**

There are two components to deadlines:

1. **Deadline for submitting all projects:** In order to graduate a term, you must submit all projects by the last day of the term and pass all projects once they are reviewed by a Udacity Reviewer (the review may take place after the last day of the term). Passing a project means a Udacity Reviewer has marked a project as “Meets Specifications.”
2. **Suggested deadlines for projects:** We strongly encourage you to submit all projects by their individual deadline to stay on track, but there is no penalty for submitting a project past its individual deadline. You are able to submit each project until the last day of the term.

# Class Timeline **Passing All Projects**

Our coaches and mentors will work directly with any students who are struggling with the timeline requirements. Our ultimate goal is to ensure that every single student accepted into the program successfully graduates.

**If you do not submit all projects by the end of the term and also pass all projects once they are reviewed:**

- You will receive a 4-week extension to complete any outstanding projects. You will receive this extension a maximum of once.  Once you submit and pass all projects, you can enroll in the next term, which will potentially be with a later class. If you do not submit and pass all projects within the 4-week extension, you will be removed from the program.

# Class Timeline **Time Dedication**

**10 HOURS / WEEK**

Between instructional content, quizzes, projects, and other course-related activity, we estimate that investing 10 hours/week will enable you to proceed through the program at a successful pace.

# Class Timeline **Schedule**

Find the dates for each of your project deadlines next to the respective lesson in your classroom.

| | |
|---|---|
| **Term Start** | First Day of Class |
| **Project 1** | Lane-Finding Project |
| **Project 2** | Traffic Sign Classifier Project |
| **Project 3** | Behavioral Cloning Project |
| **Project 4** | Advanced Lane Finding Project |
| **Project 5** | Vehicle Tracking Project Due |
| **Term End** | End of Term (all projects must be passed) |

# Hiring Partner Program

## THE PROGRAM

Our 15+ global Hiring Partners provide Udacity students from all over the world direct and preferential exposure to new jobs. We work directly with recruiters and hiring managers at each company to get our students fast-tracked into open opportunities. Students are evaluated for these positions based on skills, experience, and the projects showcased in their unique Udacity portfolios.

## UDACITY PROFILE & CAREERS LESSONS

Begin your job search by keeping your Udacity Profile up to date and turning “Recruiter Access” on your profile to “On.” This lets us know you want us to share your profile with recruiters. Also, take advantage of the Careers lessons and exercises in the classroom—our team will provide personalized feedback. See the Careers Resource Center and the Hiring Partner FAQ here.

# Student Work Opportunities

Continue to be a part of the Udacity student community with your skills. Opportunities include paid positions as Mentors, content creators, and more. Get in touch with us if you would like to participate.

# Community

Finding support in fellow students can make all the difference in your educational experience. Take advantage of your class Facebook group, Slack channel, study groups, and Udacity forums. These are all spaces to exchange ideas, questions and progress with your classmates.

## STUDY GROUPS

Every student offers their own unique knowledge and skills, and that's exactly what makes forming a study group a valuable resource as you move through the program. Interested in forming a study group? Try Meetup to form a local study group. Share it with other students on Slack and ask Lisbeth for help to get the word out. If you want to request a study group near you, submit here, and we'll match you with other students in your area.

# Community (cont.)

## COMMUNITY EVENTS

Community events will give you the opportunity to meet classmates both on and offline (dependent on location), team-build and take part in extracurricular opportunities.

## SELF-DRIVING CAR CHALLENGES

To kickoff the Self-Driving Car Engineer Nanodegree program, we introduced Udacity Challenges. Our goal is to create the world's first open source autonomous vehicle! To do this, we've broken the process down into six challenges that are open to the public and each offer a variety of prizes. While these challenges are independent of the Nanodegree program, we encourage students to participate and follow along. Read more about the process.

# Policy

## COST

The Nanodegree program costs $800 per 3-month term

## REFUND

Students have a 7-day window from the day they receive access to the program, the first day of their class, to un-enroll and request a refund. To request a refund, email **selfdrivingcar-support@udacity.com**.

# Further Reading

# Courses on Udacity

Machine Learning Engineer Nanodegree by Google (Currently Available)

Artificial Intelligence for Robots (Free Course)

Intro to Statistics (Free Course)

Deep Learning (Free Course)

Programming Foundations with Python (Free Course)

Introduction to Computer Vision

# Reading Resources

Transmission.ai - Self Driving Car & Deep Learning Newsletter (Oliver Cameron)

Self Driving Car Employers (Medium)

Are Udacity Nanodegrees worth it for finding a job? (Quora)

Udacity Nanodegree Reviews: Your Questions Answered (Udacity Blog)

We're Building an Open Source Self-Driving Car (Medium)

In-Depth on Udacity's Self-Driving Car Curriculum (Medium)

Announcing New Hiring Partners for Our Self-Driving Car Engineer Nanodegree Program (Udacity Blog)

Open Sourcing 3½ Hours of Driving Data (With LIDAR!) (Medium)

Open Sourcing 223GB of Driving Data (Medium)

# News / Resources

Self-drive taxis to be tested in Singapore (BBC)

GM buys self-driving car kit startup Cruise, plans to use tech to make driverless cars (TechCrunch)

26-year-old hacker gets $3M for self-driving car startup (CNN)

Zoox raises $200 million at $1 billion valuation for its self-driving cars (TechCrunch)

Mercedes Self Driving Bus Official Commercial (YouTube)

End to End Learning for Self-Driving Cars (NVIDIA)

33 Corporations Working On Autonomous Vehicles (CB Insights)

On the road with George Hotz's $1,000 self-driving car kit (The Verge)

# News / Resources (cont.)

Trucking Industry (OTTO)

Self-Racing Cars Kick Off First Autonomous Vehicle Track Day (NVIDIA)

# Open Source Projects

comma.ai for the people to experiment with too (OTTO)

# Datasets

Cityscapes Dataset

Robot Car Datasets

Self Racing Cars Dataset

Self Racing Cars Dataset 2

Comma.ai Driving Dataset

# Other Resources

Stanford Convolutional Neural Networks for Visual Recognition

Deep Learning Framework written in Swift to use on apple devices (written by @amund)

Image Segmentation From comma.ai