

# Self Driving

## 整体概述

- <https://zhuanlan.zhihu.com/p/415307584>
- 资料合集 <https://zhuanlan.zhihu.com/p/58422485>
- <https://zhuanlan.zhihu.com/p/504375332>
- 很赞的github项目: pythonRobotics [https://atsushisakai.github.io/PythonRobotics/modules/path\\_planning/bspline\\_path/bspline\\_path.html](https://atsushisakai.github.io/PythonRobotics/modules/path_planning/bspline_path/bspline_path.html)
- python控制相关的库
  - Sympy <https://docs.sympy.org/latest/tutorial/index.html#tutorial>
  - Control <https://python-control.readthedocs.io/en/0.9.1/intro.html>

## 规划

- 路径规划
  - 高飞——运动规划 [https://www.bilibili.com/video/BV1Et4y167Ak?spm\\_id\\_from=333.1007.top\\_right\\_bar\\_window\\_custom\\_collection.content.click](https://www.bilibili.com/video/BV1Et4y167Ak?spm_id_from=333.1007.top_right_bar_window_custom_collection.content.click)
  - 机器人路径规划、轨迹优化系列课程 <https://www.bilibili.com/video/BV1yT4y1T7Eb?p=2>
  - <https://www.cs.cmu.edu/~motionplanning/lecture/lecture.html>
  - 很赞的github仓库 <https://github.com/zhm-real/PathPlanning>

## 决策

- control
  - LQR
    - DR\_CAN [https://www.bilibili.com/video/BV1RW411q7FD?spm\\_id\\_from=333.999.0.0](https://www.bilibili.com/video/BV1RW411q7FD?spm_id_from=333.999.0.0)
    - [https://blog.csdn.net/qq\\_24649627/article/details/104690279](https://blog.csdn.net/qq_24649627/article/details/104690279)
    - <https://jonathan-hui.medium.com/rl-lqr-ilqr-linear-quadratic-regulator-a5de5104c750>
  - Pure pursuit
  - MPC
    - DR\_CAN [https://www.bilibili.com/video/BV1cL411n7KV?spm\\_id\\_from=333.999.0.0](https://www.bilibili.com/video/BV1cL411n7KV?spm_id_from=333.999.0.0)
    - [https://blog.csdn.net/weixin\\_44718107/article/details/123944631#commentBox](https://blog.csdn.net/weixin_44718107/article/details/123944631#commentBox)
    - Apollo代码学习 [https://blog.csdn.net/u013914471/category\\_8019324.html](https://blog.csdn.net/u013914471/category_8019324.html)
    - <http://www.mpc.berkeley.edu/mpc-course-material>
    - [http://cse.lab.imtlucca.it/~bemporad/mpc\\_course.html](http://cse.lab.imtlucca.it/~bemporad/mpc_course.html)
  - PID
- learning
  - 忠厚老实的老王 <https://space.bilibili.com/287989852/video?tid=0&page=2&keyword=&order=pubdate>
  - 小黎的Ally <https://space.bilibili.com/477041559/channel/seriesdetail?sid=863037&ctype=0>
  - 很赞的github仓库
    - <https://github.com/zhm-real/MotionPlanning>
    - <https://github.com/Shunichi09/PythonLinearNonlinearControl>
- 行为决策建模
  - Self-driving cars with Carla and Python <https://www.youtube.com/watch?v=J1F32aVSYaU>
  - MDP
  - POMDP

## \*预测

- 卡尔曼滤波
    - 线性卡尔曼
    - 扩展卡尔曼
    - 无迹卡尔曼
- <https://github.com/rllabbe/Kalman-and-Bayesian-Filters-in-Python>

## 无人车模型

- 运动学
- 动力学

## 自动驾驶仿真环境

- Highway-env
  - <https://highway-env.readthedocs.io/en/latest/environments/highway.html>
  - <https://github.com/eleurent/highway-env>
- Udacity's Self-Driving Car Simulator
  - <https://github.com/udacity/self-driving-car-sim>
  - DL
    - <https://www.leiphone.com/category/transportation/RuoKaDSTmd1dCIUV.html>
    - <https://www.zybuluo.com/Pigmon/note/902580>
  - Term 2 Simulator <https://github.com/udacity/self-driving-car-sim/releases>
  - self-driving-car project <https://github.com/ndrplz/self-driving-car>
- Car\_demo——ROS-GAZEBO [https://github.com/osrf/car\\_demo](https://github.com/osrf/car_demo)
- Carla
  - <https://github.com/carla-simulator/carla>
  - <https://www.zhihu.com/people/xie-xiao-fei-78-24/posts>

## 常用的优化求解器

## 编程

- C++
- python

## 百度Apollo

- EM Planner
- Lattice Planner
- Apollo平台学习
  - [https://blog.csdn.net/Travis\\_X](https://blog.csdn.net/Travis_X)
  - cyberRT
  - <https://github.com/daohu527/Dig-into-Apollo>