Apollo 自动驾驶工程师技能图谱

Basic

- Toolbox
  - Bazel
  - Protobuf
  - Docker
  - ROS（Apollo3.1前）/ Cyber RT
  - OpenCV
- Language
  - C++
  - Bash
  - Python
  - JavaScript
    - Node.js
    - React
- Machine Learning Frameworks
  - Caffe
  - Keras
  - TensorFlow

Cloud Service Platform（Apollo）

- HD Map
  - OpenDrive
- Simulation
  - Matlab/Simulink
  - GameEngine(UE4)
- Data Platform
  - 虚拟化
  - 异构计算
  - 分布式计算
  - 分布式存储
- Security
- OTA
- DuerOS

Hardware

- Computing Unit
- Sensor
  - Camera(单目 / 双目)
  - LiDAR
  - Radar
  - Ultrasonic Sensor
  - GPS / IMU
  - Other Sensors
- CAN Card
- HMI Device
- Black Box
- ASU
- AXU

V2X

- RSU/OBU设备
- V2X数据交互协议
- V2X数据融合

Vehicle（Apollo）

- Protocol
  - Can
  - Lin
  - FlexRay
- 动力系统控制
- 制动系统控制
- 转向系统控制
- Drive-by-wire Vehicle
- 车辆电子控制系统
- 车载语音交互系统
- AUTOSAR

Cyber RT

- 协程
- 调度
- 服务发现
- 数据抽象
- 高性能并行计算
- 自适应通信系统
- Atomic编程
- 实时系统

Apollo 开发者社区

Open Modules（Apollo）

- Map Engine
  - GIS基础: WGS84、UTM
  - 图形学与计算几何
- Localization
  - GNSS/RTK
  - 激光点云处理
  - 惯性导航
- Perception
  - Deep Learning:CNN、DNN...
  - Low-level Vision
  - 图形学与视觉几何
  - 状态估计与滤波
  - 最优化问题求解
- Prediction
  - Convolution Neural Networks
  - Recurrent Neural Networks
  - Reinforcement Learning
  - Dynamic Models
  - Probability Theory
  - Bayesian Analysis
- Planning
  - Smoothing Curves
  - Vehicle Kinematics
  - Station-time 2D Model
  - Optimization Algorithms : Dynamic Programming
  - Quadratic Programming
  - Smoothing Spline
  - Probability Math Models : Bayesian
  - Markov Process
  - MDP
  - Machine Learning:
    - CNN
    - RNN
    - Reinforcement Learning
    - Multi Module Fusion
  - Basic Motion Planning Technique
  - Sampling Based Motion Planning
  - Computer Science : Parallel Programming
  - Dynamic Programming
  - Computation Geometry
  - 深度学习算法、BP 算法
- Control
  - PID
  - Optimization Based Control
  - Adaptive Control
  - System Identification
  - Robust Control
  - Vehicle Kinematics
  - Vehicle Dynamics
  - Non-Linear Optimization
  - Linear/Non-Linear State Estimation
  - Signal Processing
  - Analog/Digital Filters
  - Analog/Digital Control
  - Machine Learning : CNN、RL

Apollo自动驾驶工程师技能图谱 V2.0

apollo × Geekbang 极客邦科技

Apollo 开发者社区 & 极客邦联合出品

Github 地址：https://github.com/apolloauto　官网地址：http://apollo.auto/index_cn.html