

亮道智能数据解决方案

智能驾驶功能的开发迭代需要感知算法的持续优化,而算法的优越性取决于数据闭环效能和训练数据的质量。亮道智能感知训练数据解决方案服务于智能驾驶量产开发项目,帮助客户快速测试验证、评估、训练智能驾驶感知能力,高效、低成本地以数据驱动自动驾驶系统能力提升。

服务内容



专业的定制
化车辆改装
与标定



支持多传感
器同步的数
据采集



具有丰富量
产经验的数
据管理



高质量自动
化及人工数
据处理



精准且易用
的场景挖掘
与分析



高效准确的
感知算法性
能测评

核心优势

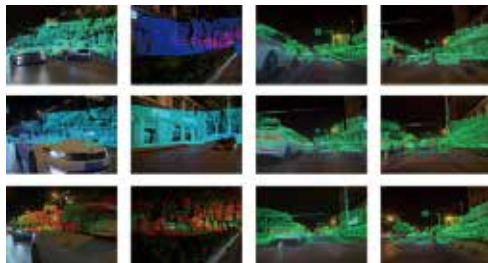
- 从数据采集到感知算法评价训练的全套智能化数据处理工具链
- 面向量产感知系统,从产品到定制开发的全栈式技术支持
- 从方案到售后的保姆式服务,帮助客户极大提升智能驾驶车辆感知功能开发效率,快速完成智驾算法模型迭代

亮道自研数据工具链产品

数采传感器标定 LD Calibrator

LD Calibrator 是一款自动化车辆传感器标定软件,用户可通过标定软件,将车辆上的传感器和车辆坐标系达成统一。

- 支持激光雷达一键精细配准,相机内外参一键标定。
- 支持激光雷达和摄像头的联合标定,让多传感器数据融合更准确可靠
- Web在线灵活部署,操作简单,即开即用。
- 支持多种数据格式输入输出,满足多种应用需求。



数采软件 LD Logger

LD Logger是一款搭载在车端的数据采集软件,为用户提供传感器状态实时感知、采集数据实时可视化显示,采集场景实时标注等功能。

- 多传感器(激光雷达、相机、CAN)同时采集。
- 传感器采集可视化(点云图像、相机图像)。
- 采集设备状态实时监控并反馈用户。



数据自动化标注 LD ALT

LD ALT是一款激光雷达点云的自动化数据处理工具,通过亮道自研的激光雷达感知算法,可以将周围交通参与者信息与自车动态信息融合在一起,输出交通参与者目标数据、本车运动信息及道路信息等。

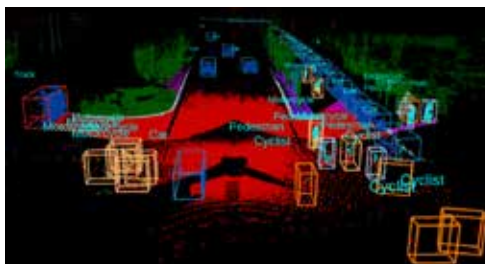
- 实现多类型动静态目标物识别。
- 动态目标运动参数(位置方向、速度、加速度等)精准感知。
- 实现对感知结果的统一管理 with 统计分析。



数据标注 LD Editor

LD Editor是一款帮助数据标注人员对激光雷达点云数据进行标注的软件工具,通过后处理算法对道路信息和目标信息进行识别分类。

- 具备继承、自动贴合、自动纠错等核心功能。
- 极大提高真值标注的速度,减少手动标注工作量,缩短了真值生成时间。



大数据管理平台 LD DMS

LD DMS是一站式大数据管理及测评平台,打通数据预处理、场景挖掘、分析与管理等环节,可实现资源管理、数据采集管理、文件管理、流水线管理、场景管理、感知集合管理、物体库管理、场景标注及传感器KPI测评等功能。

- 一站式大数据管理平台,功能丰富。
- 高效管理海量数据,充分挖掘数据价值。



感知性能评价 LD KPI

LD KPI通过对待测评设备或系统输出的感知结果与真值结果逐帧逐个目标物进行对比分析,最终将分析结果输出为分析报告,报告包含准确率、召回率等分析指标。

- 多维度量化反映待测评设备或系统的性能优劣。
- 自定义评测的时间范围、空间范围、类型范围和测评指标。



LiangDao Data Solution

The development and iteration of intelligent driving features requires continuous optimization of perception algorithms, and the superiority of the algorithms depends on the effectiveness of data closure and the quality of training data. LiangDao's perception training data solution aims to support mass production driving development projects by assisting clients in testing, validating, evaluating, and training intelligent driving perception capabilities quickly as well as using data to drive autonomous driving system capabilities effectively and economically.

LiangDao Data Solution



Professional customized vehicle modification and calibration



Multi-sensor calibration, fusion data acquisition



Data management with rich experience in mass production



High quality automated and manual data processing



Scenario mining and analysis that is both precise and easy to use



Efficient and accurate performance evaluation of perception algorithms

Core Advantages

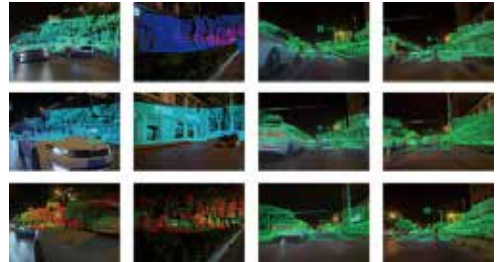
- A complete toolchain of intelligent data processing from data acquisition to perception algorithm training
- Full-stack technical support for mass-production perception systems, from standardized product to customized development
- Thoughtful service from solution design to after-sales, empowering customers to improve the efficiency of intelligent driving vehicle perception function development and quickly complete the iteration of intelligent driving algorithm model

LiangDao Self-developed Data Processing Toolchain

Sensor Calibration Software LD Calibrator

LD Calibrator is a self-developed automated vehicle sensor calibration software, which supports the calibration of multiple sensors in a vehicle coordinate system.

- supporting one-click precise alignment of LiDAR and one-click calibration of camera internal and external parameters.
- Supporting the joint calibration of LiDAR and camera to make the multi-sensors data fusion more accurate and reliable.
- flexible deployment online, user-friendly interface and quick to get started.
- Supporting multiple data input and output formats to meet various application requirements.



Data Acquisition Software LD Logger

LD Logger is a data acquisition visualization software deployed on the vehicle side, self-developed by LiangDao. It can support online timing and monitoring of sensor status, visualization of acquired data, scenarios tagging in real time, etc..

- Multi-sensors (LiDAR, camera, CAN) data acquisition at the same time.
- Real-time acquisition visualization of point cloud and camera images.
- Real-time monitoring of acquisition devices status and feedback to users.



Data Automatic Labeling Algorithm Software LD ALT

LD ALT is an automatic point cloud data labeling tool, which can fuse the vehicle dynamic information with traffic participants by LiangDao self-developed AI perception algorithm. It can output traffic objective data, ego car dynamic parameters and road features, etc..

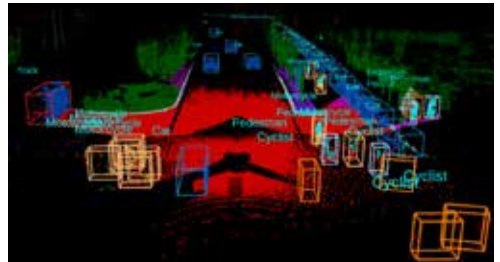
- Multi-type dynamic and static objectives recognition.
- Accurate perception of dynamic objectives' parameters, including position, direction, velocity, acceleration, etc.
- Significantly improving the labeling efficiency.



Data Labeling Software LD Editor

LD Editor is a semi-automated 3D point cloud data labeling software, which can identify and classify the features of objectives and roads.

- Core functions such as inheritance, automatic fitting, and automatic error correction.
- Greatly improving the efficiency of ground truth production, reducing the manual labeling workload, and shortening the time of ground true production.



LD Data Management System

LD Data Management System (DMS) is a one-stop big data management platform on cloud, which connects multiple data function modules including data pre-processing, data automatic labeling, scenario mining, analysis and management, etc., and can realize resource management, data acquisition management, file management, pipeline management, scenario management, perception set management, objective database management, scenario labeling and other functions.

- One-stop big data management platform with rich functions.
- Efficient management of big data and full exploitation of data value.



Perception Algorithms KPI Evaluation Tool LD KPI

LD KPI can automatically compare the perception results of DUT with ground truth and output a performance KPI report, including accuracy, recall rates, etc..

- Multi-dimensional quantitative reflection of the performance of the DUT or perception system.
- Customize the time, space, type and metrics of the evaluation.

