
Berkeley Deep Drive

Data Library Development

Trevor Darrell, Ching-Yao Chan
UC Berkeley

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Data Library

- **A Core Activity of BDD**
- **Goal is to establish a large data library**
 - **To include video, image, and vehicle-based data sets**
 - **To facilitate implementation and testing of algorithms developed in BDD**
 - **To encourage open data sharing**
- **Multi-Prong Approach**
 - **Online open/shared resources**
 - **Crowd-sourced data collection**
 - **Rich data sets with highly instrumented vehicle**

Data Sources (1)

- **Online Image Sources**
 - **E.g. Google StreetView**
- **Community-Based Image Sources**
 - **Collaboration with external sources, e.g. Mapillary**
 - **Crowd-sourced street pictures**
 - **Picture captured and shared**
 - **Map edited and explored**
 - **Tool for data extraction and labeling**

Data Sources (2)

- **Online Video Sources**
 - e.g. Youtube
- **Crowd-Sourced Video Sources**
 - Simple dash camera video collection
 - Smart-phoned based app for video recording
 - In-house development
 - Collaboration with external sources, e.g. Nexar
 - Crowd-sourced driving video
 - Incident data recording and accident reconstruction
 - Cloud data aggregation and management
 - Networked crowd to enable extended applications

Data Sources (3)

- **Vehicle-Based Data Collection**
 - **In-house instrumented test vehicle**
 - **camera, radar, lidar, vehicle CAN, etc.**
- **Collaboration with External Sources**
 - **Portal linked to external open sources**
 - **Shared library with collaboration partners**
 - **Institutions working on autonomous driving**
 - **Open invitation to all to create large shared library**

Data Library Tools

- **Development of Data Processing Tools, e.g.**
 - **Screening for usable data**
 - **Image annotation and labeling**
- **Learn from other institutions**

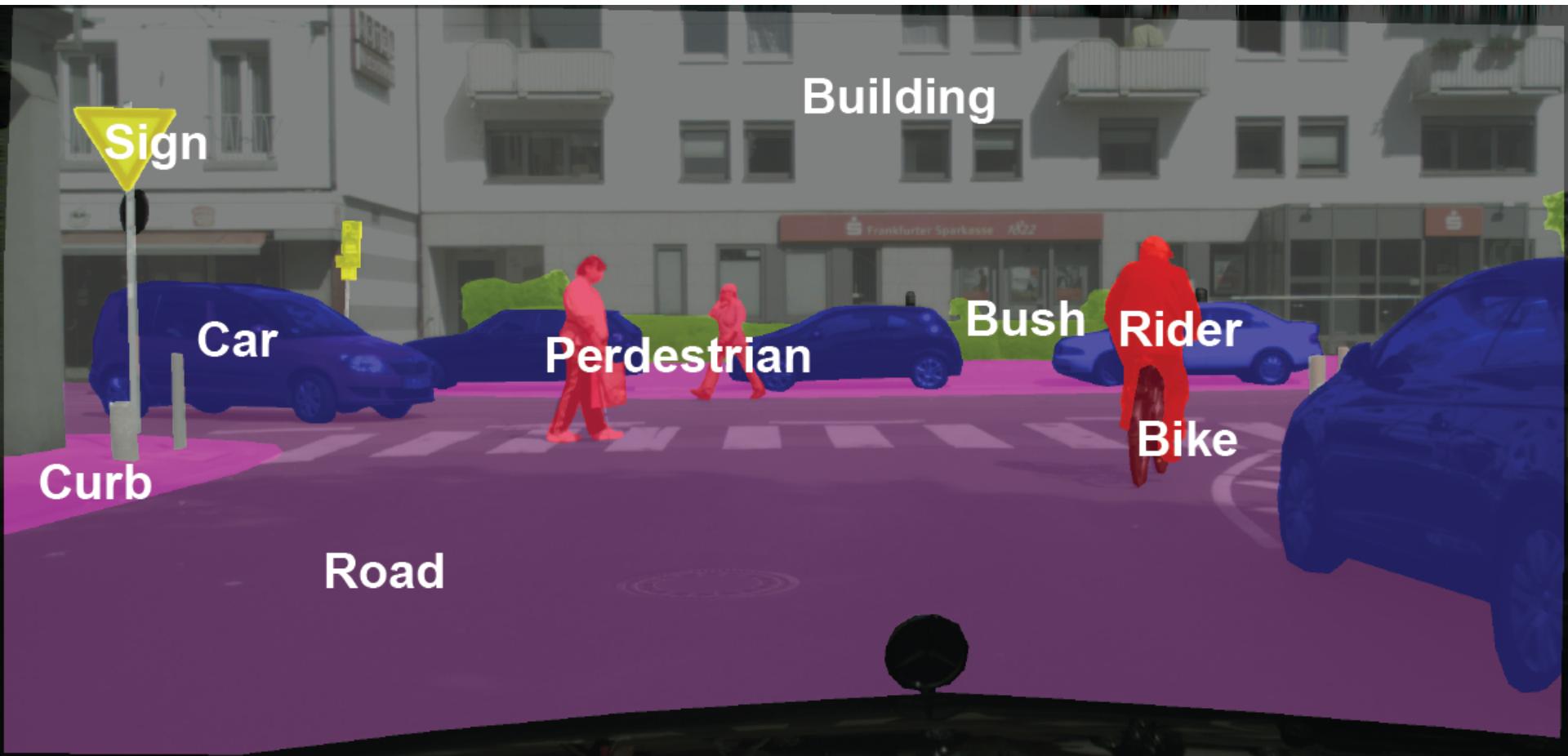
Data Labeling Discussion

**Fisher Yu
Postdoc, BDD**

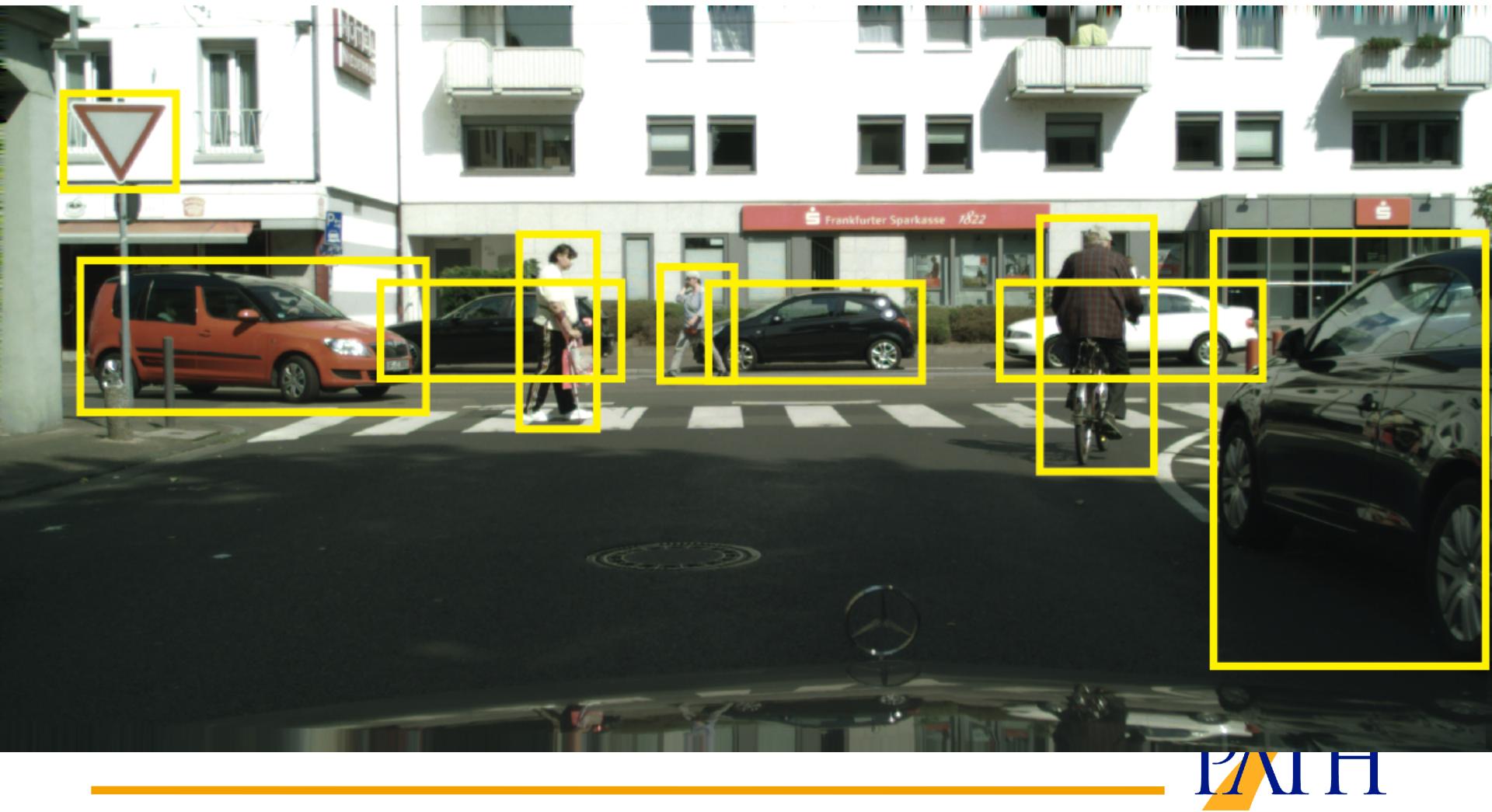
Street Scene Image



Segmentation



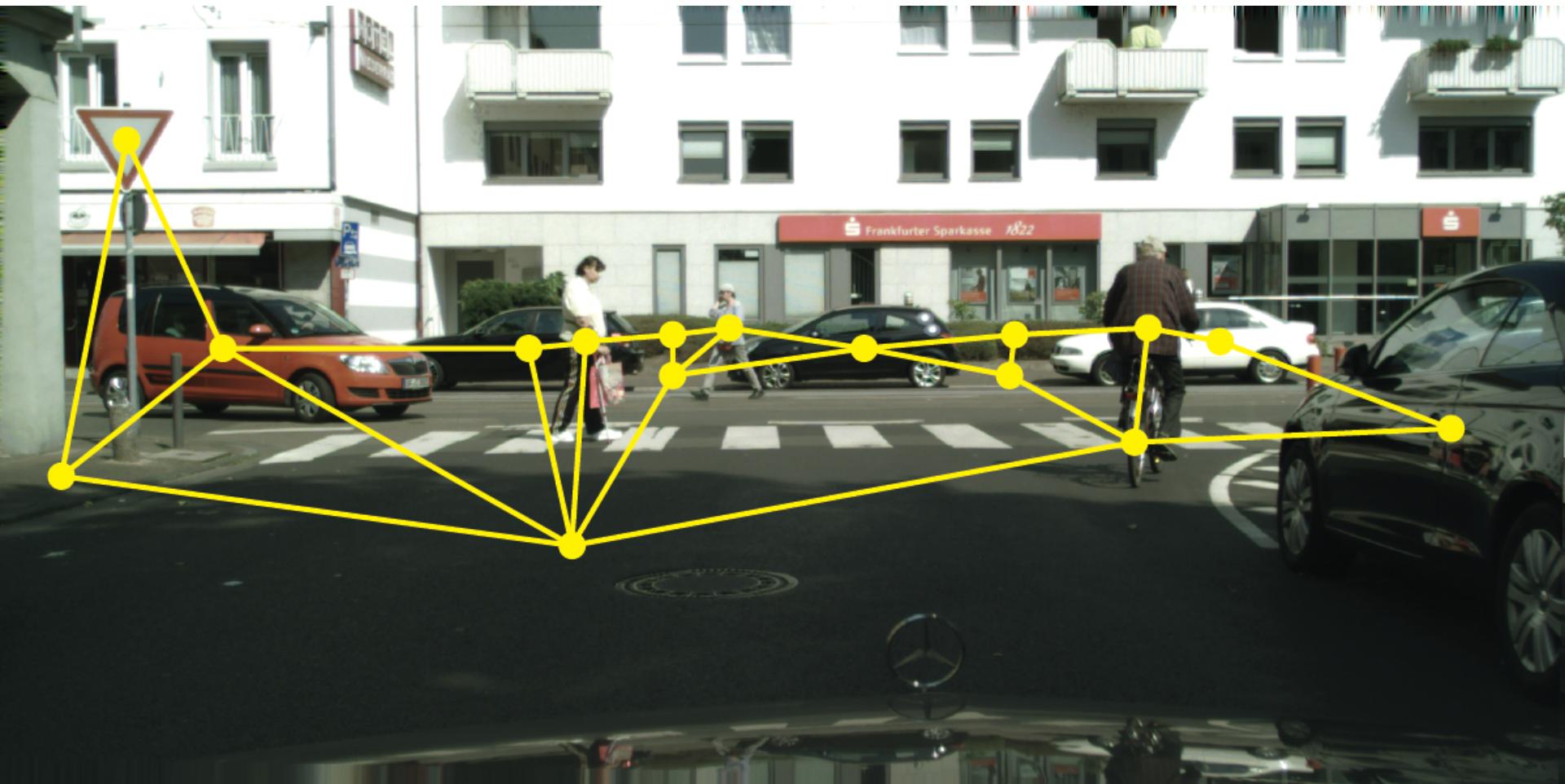
Bounding Box



Mesh

- **Vertices for each object center or attribute**
- **Edges for relations**

Mesh



Hierarchies of Attributes

- **Objects**
 - **Human**
 - **Vehicles**
 - **Construction**
 - ...
- **Drivability**
 - **Driveable area**
 - **Emergency only area**
 - **Obstacle**
 - ...
- **Driving options**
 - **Turn**
 - **Stop**
 - **Slow down**
 - **Switch lane**
 - ...

Comments and Questions on Data Collection?

Please contact Trevor and Ching-Yao

Thank You!