POSS: <u>P</u>KU <u>O</u>mni-directional <u>S</u>mart <u>S</u>ensing
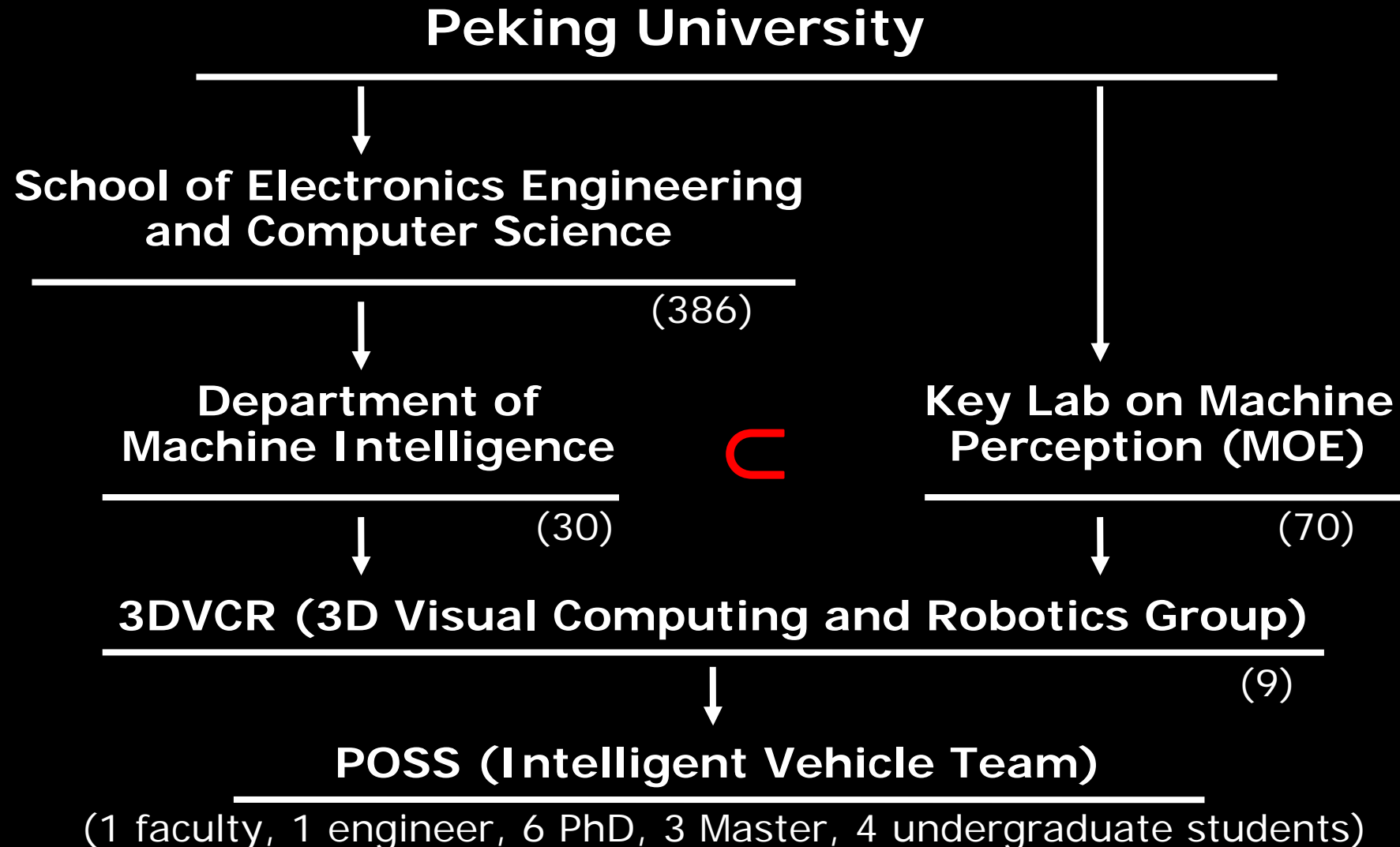
URL: www.poss.pku.edu.cn

Towards Omni-directional Sensing and Reasoning in Real World Environment

Huijing Zhao, zhaohj@cis.pku.edu.cn

Key Lab on Machine Perception (MOE)
School of Electronics Engineering and Computer Science
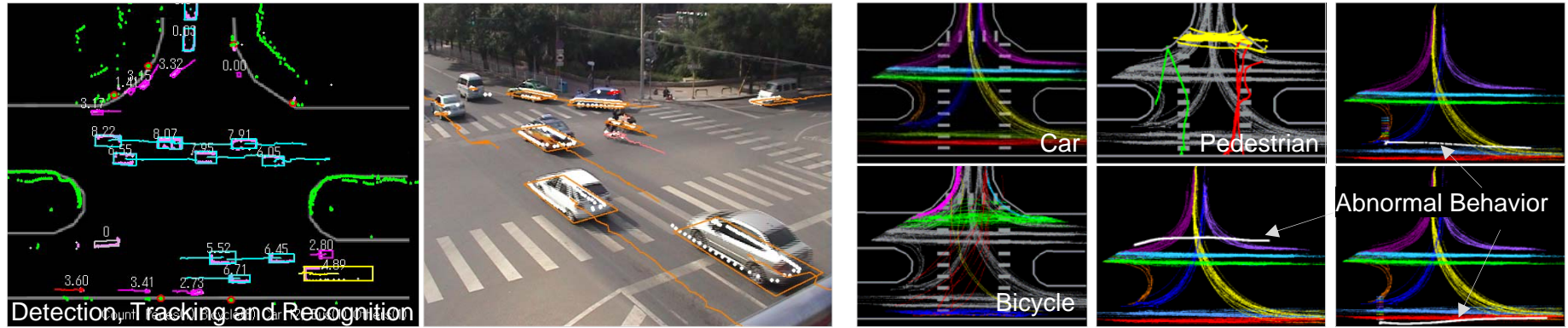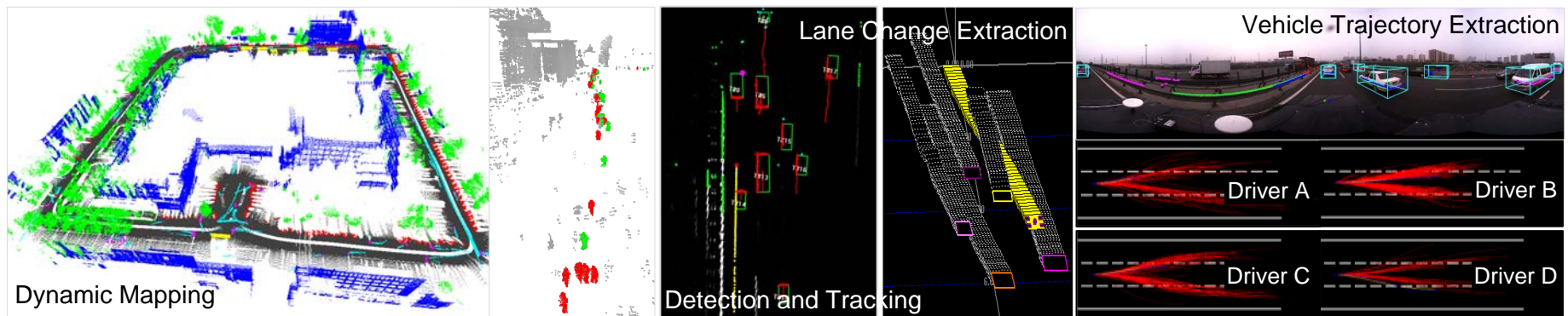
Peking University

Where is POSS Team?

Peking University

↓

School of Electronics Engineering and Computer Science

(386)

↓

Department of Machine Intelligence ⊂ **Key Lab on Machine Perception (MOE)**

(30)   (70)

↓   ↓

3DVCR (3D Visual Computing and Robotics Group)

(9)

↓

POSS (Intelligent Vehicle Team)

(1 faculty, 1 engineer, 6 PhD, 3 Master, 4 undergraduate students)

POSS Team

2013.11

Monitoring a traffic scene through network sensing

Detection Tracking and Recognition

Car

Pedestrian

Bicycle

Abnormal Behavior

Monitoring a dynamic procedure or scene using an intelligent vehicle

Dynamic Mapping

Detection and Tracking

Lane Change Extraction

Vehicle Trajectory Extraction

Driver A

Driver B

Driver C

Driver D

Intelligent vehicle and network sensing platforms

Dynamic Sensing Platform

POSS-V

Autonomous Driving Platform
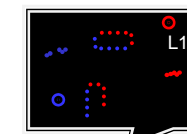
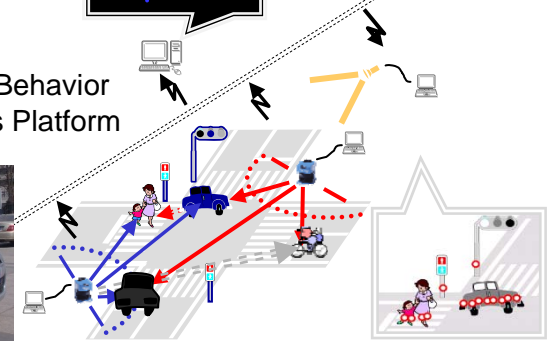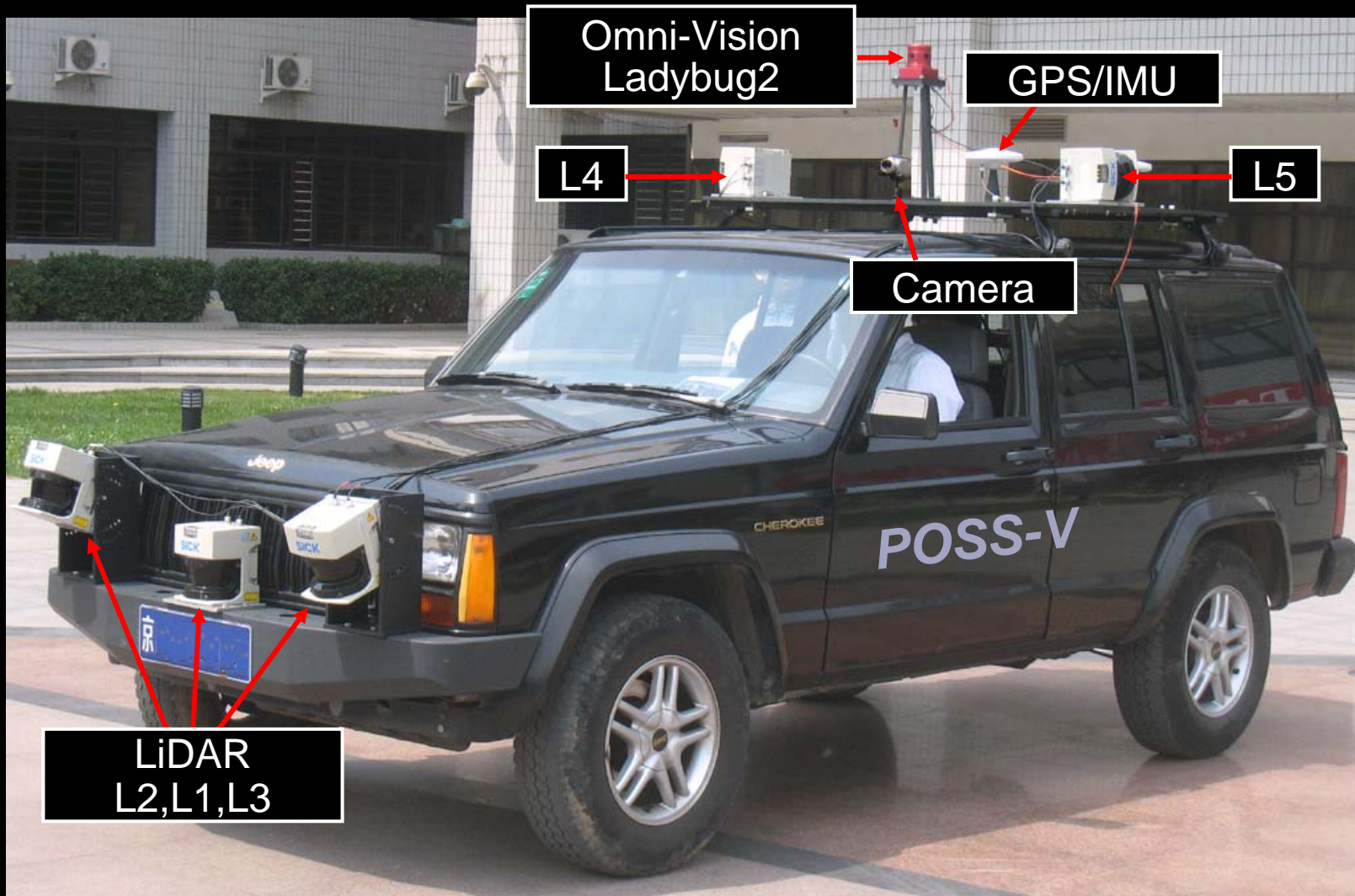Robot-Car Platform

Driving Behavior Analysis Platform

L1

Network Sensing Platform

A Dynamic Sensing Platform

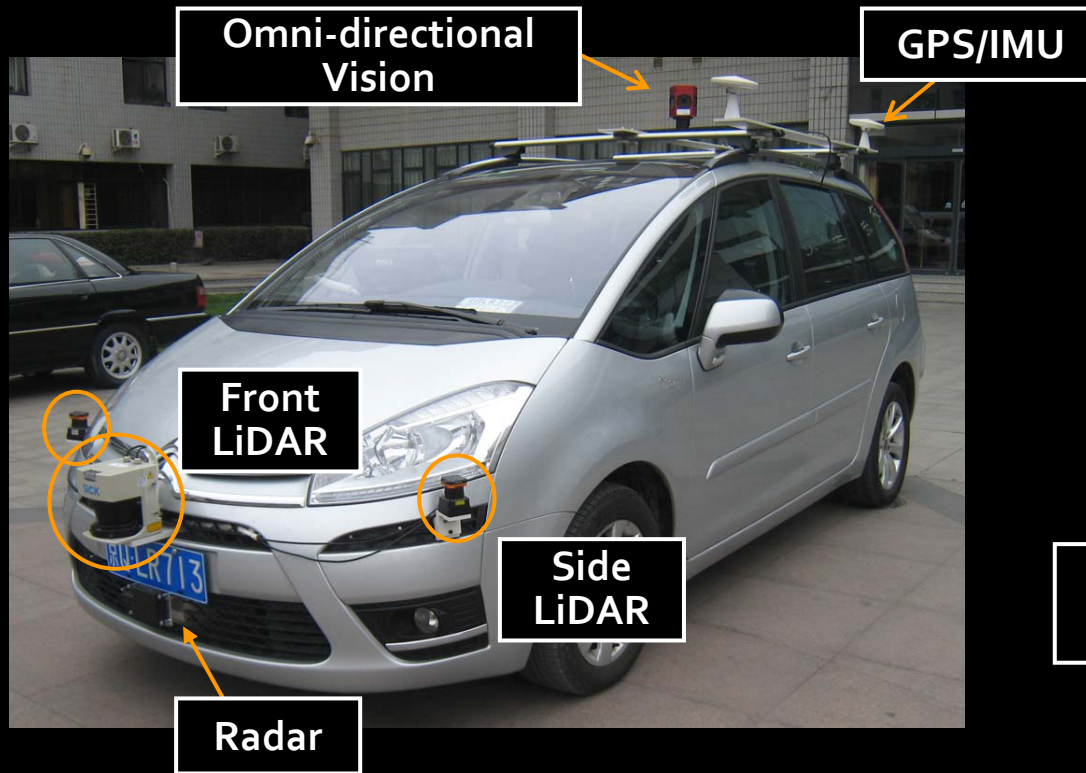2008~2016

An Autonomous Driving Platform

2010~2014

demo1

demo2

A PSA Platform

Sponsored by PSA

Omni-directional Vision

GPS/IMU

Front LiDAR

Side LiDAR

Radar

Rear LiDAR

Electricity Supply

CAN Gateway

TITS16-1 accident

On-road data collection for driving behavior learning and reasoning

2013~

An Off-Road Platform

3D Lidar

Omni-Vision

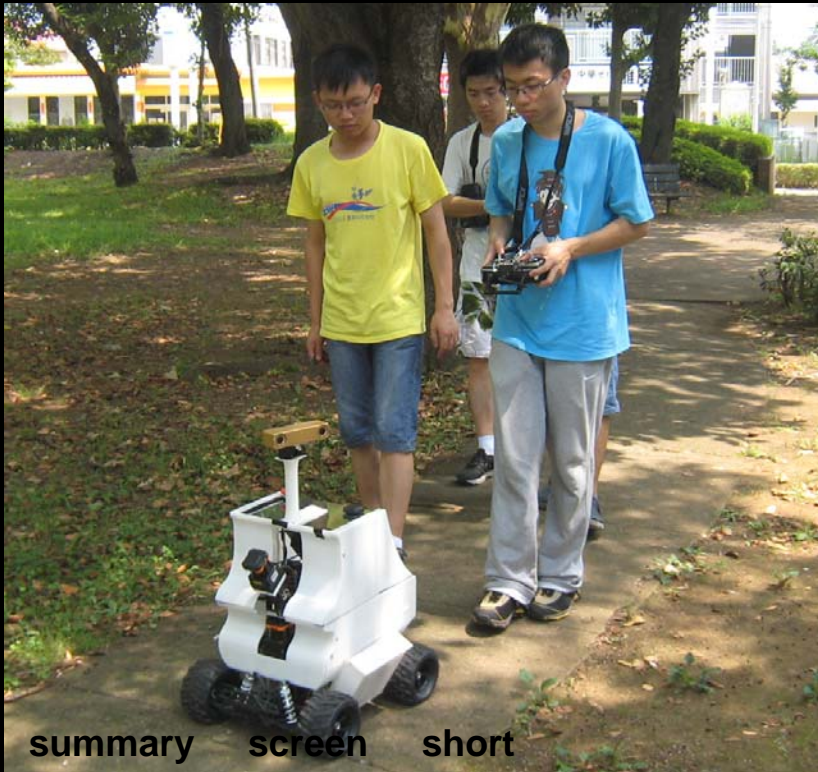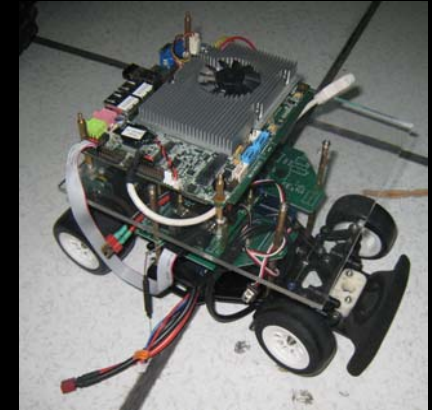Stereo-Vision

GPS/IMU

2D Lidar

机所凸障碍

塔河动规1

坨里凹障碍

路面检测

2016~
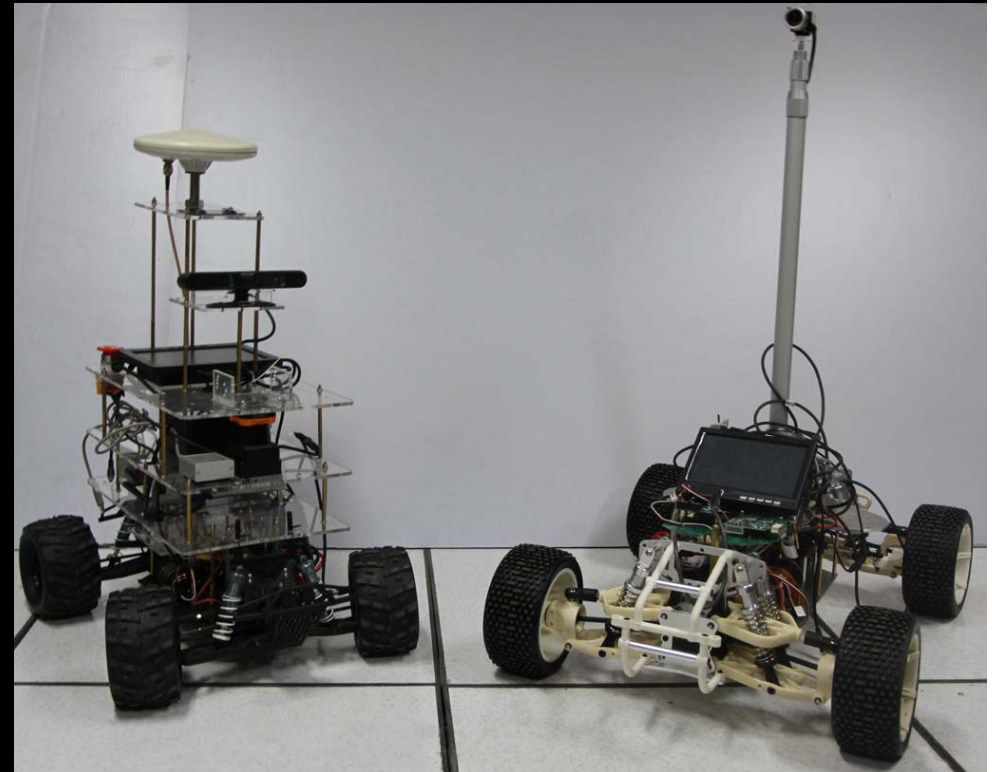
Robotic Platforms

miny

tiny

goblin

summary   screen   short

Tsukuba Robotic Challenge 2013-14

POSS-MINYs 2013~

Our New Platform

Robot Car

Autonomous Wheel Chair

2014~

Valeo Challenge 2015

Wheeled + Tracked

Wheeled   Tracked

Our Goal

We focus on **perception and reasoning techniques** of intelligent vehicle.

We want to develop an intelligent vehicle of **Omni-directional** eyes perceiving an environment of both static and dynamic objects.

We want to **reason based on real world sensing data**, so that to aware situations and predict potential risks.

We want to **map** dynamic environments, which contains 3D geometry, semantics and scene dynamics.

We want to **study potential applications** in car navigation, traffic simulation, surveillance, etc.

Key Issues

- **Sensor Alignment** IROS13,ICRA14,ITSC14

- **Localization** IV14   ACTA16

- **3D Mapping** POI

                                    Road Detection

- **Mobile Object Detection and Tracking** IV12   IROS12

                          IROS14   VC15

- **Scene Understanding**

                          FYK ICRA10

- **Behavior Analysis** IV12,IV13

                 DMARP

- **…**   TITS16-1

        ICRA11   TITS16-2

            EgoCtr

Competitions and Open Experiments   Sensing at an Intersection

Welcome To POSS !

Contact: 赵卉菁 / ZHAO Huijing, zhaohj@cis.pku.edu.cn

Tel: +86-1062757458

http://www.poss.cis.pku.edu.cn/