Zihang Huang

Perception Fusion Discipline Manager at Desay SV Automotive

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Current Position

Apr. 2022 - Present — **Desay SV Automotive Singapore PTE.LTD**

Principal Software Engineer / Discipline Manager

- **Initiated and led a new business line** on **L4 unmanned logistics robot platform**, serving as the principal architect for perception system design. The first prototype was completed and launched in **March 2025**.
- **Managed a cross-regional perception and fusion team** of ~40 engineers across Chengdu, Shenzhen, Nanjing, Huizhou, and Singapore. Led the end-to-end development and delivery of two L2+ production-grade perception systems for Dongfeng eπ007 & eπ008, which were successfully launched in **June 2024**.
- **Designed and deployed a Lidar-based 4D Scenario Reconstruction Autolabelling System**, enabling automated lane line and road marker annotation:
  1. Reduced annotation cost from **6000 RMB/clip** to **35 RMB/clip** (↓99.4%)
  2. Improved processing time per clip by **37.5%** (from 1.6h to 1.0h)
- **Built a scalable Moving Object Detection (MOD) Autolabelling Pipeline**, eliminating manual labor in large-scale dataset creation:
  1. Reduced per-frame cost from **20 RMB** to **2.5 RMB** (↓87.5%)
  2. Achieved **98.5%** recall, **6cm** positional error, and **4cm** scale error
  3. Achieved **192K frames/day** throughput, enabling high-efficiency training data generation

Experiences

Apr. 2020 - Mar.2022 — **Desay SV Automotive Singapore PTE.LTD**

Senior Software Engineer / Group Leader

- **Led a team of 7 perception engineers**, responsible for modular integration, validation, and system-level requirement definition across core components including **Object Detection, Lane Detection, Lidar Detection, and Sensor Fusion.**
- **Delivered a full-stack autonomous driving system**, contributing to Desay SV's prototype vehicle that won **Silver Medal (Ranked 6th/143 teams) at the 2021 World Intelligent Driving Challenge (WIDC)** — China's highest-tier autonomous driving competition. https://en.desaysv.com/index.php?id=5152
- Optimized and deployed a **lightweight 3D object detection engine** for the automotive-grade IPU03 platform, achieving real-time inference under tight hardware constraints with a 100-meter effective range and <5% absolute position error.

Aug. 2018 - Mar.2020 — **Desay SV Automotive Singapore PTE.LTD**

Software Engineer, Computer Vision (ISO26262 Certificated)

- Designed and deployed a one-stage object detection model optimized for vulnerable road users on the IPU03 embedded platform, achieving 95% mAP across complex urban and highway scenarios, with a 120-meter detection range at 83.3 FPS.
- Developed and deployed a monocular depth estimation model using deep neural networks on the IPU03 embedded platform, achieving real-time inference at 25 FPS with depth errors of <3.4% at 50 meters and <5.6% at 100 meters.
- **Contributed as a core member of the perception team** in securing the **Autonomous Driving Road Test License from the Singapore Land Transport Authority (LTA)** — one of the first international road test licenses awarded to a Chinese Tier-1 supplier. https://sg.news.yahoo.com/good-start-2020-desay-sv-020000611.html

Education

2023 - Present — **South China University of Technology, School of Computer Science and Engineering, Guangzhou, China**
Doctor of Engineer Candidate, Supervised by Professor C.L. Philip Chen

2016 - 2018 — **University of Pittsburgh, Swanson School of Engineering, Pittsburgh, PA, U.S.**
Master of Electrical and Computer Engineering **GPA:3.9/4.0**

2012 - 2016 — **Guangzhou University, School of Mechanical and Electrical Engineering, Guangzhou, China**
Bachelor of Electrical Engineering **GPA:3.4/5.0**

Patents

Z. Huang, et al. *Category Determination Method, Apparatus, Device and Storage Medium*, Chinese Invention Patent, Application No. **CN115774844A**, Published: **Mar. 10, 2023**.
Z. Huang, et al. *3D Object Detection Method Based on Monocular Camera*, PCT Application**: PCT/CN2021/102534**, Filed: **Jun. 25, 2021**. Chinese Patent Application No. **CN112883790A**, Published: **Jun. 1, 2021**
M. Y. Yu, **Z. Huang**, et al. *Traffic Signal Light Detection Method, Apparatus, Device and Storage Medium for Vehicles*, Chinese Invention Patent, Application No. **CN117456509A**, Published: **Jan. 26, 2024**.
N. N. Liu, **Z. Huang**, et al. *Lane Line Tracking Method, Apparatus, Device and Medium*, Chinese Invention Patent, Application No. **CN117475394A**, Published: **Jan. 30, 2024**.
Y. X. Li, **Z. Huang**, et al. *Perception Fusion System, Electronic Device and Storage Medium*, Chinese Invention Patent, Application No. **CN116664997A**, Published: **Aug. 29, 2023**.
N. N. Liu, **Z. Huang**, et al. *Object Detection Method, Apparatus, Device and Storage Medium*, Chinese Invention Patent, Application No. **CN115761698A**, Published: **Mar. 7, 2023**.
X. H. Ge, **Z. Huang**, et al. *Vehicle Driving Control Method, System and Storage Medium*, Chinese Invention Patent, Application No. **CN116215526A**, Published: **Jun. 6, 2023**.
Siegfried Bolong, H. N. Ruan, **Z. Huang**, et al. *Automatic Calibration Method, System and Computer-Readable Storage Medium*, Chinese Invention Patent, Application No. **CN118376986A**, Published: **Jul. 23, 2024**.

Publications

Li, Yuxin, Yiheng Li, Xulei Yang, Mengying Yu, **Zihang Huang**, Xiaojun Wu, and Chai Kiat Yeo. *QuadBEV: An Efficient Quadruple-Task Perception Framework via Bird's-Eye-View Representation*. **2024 IEEE 27th International Conference on Intelligent Transportation Systems (ITSC)**, September 24- 27, 2024, Edmonton, Canada. DOI: https://doi.org/10.48550/arXiv.2410.06516
Li, Yuxin, Qiang Han, Mengying Yu, Yuxin Jiang, Chai Kiat Yeo, Yiheng Li, **Zihang Huang**, Nini Liu, Hsuanhan Chen, and Xiaojun Wu. *Towards Efficient 3D Object Detection in Bird's-Eye-Space for Autonomous Driving: A Convolutional-Only Approach*. **2023 IEEE 26th International Conference on Intelligent Transportation Systems (ITSC)**, pp. 2170-2177. DOI: https://doi.org/10.48550/arXiv.2312.00633
Li, Yuxin, Yiheng Li, Xulei Yang, Mengying Yu, **Zihang Huang**, Xiaojun Wu, and Chai Kiat Yeo. *Learning Content-Aware Multi-Modal Joint Input Pruning via Bird's-Eye-View Representation*. arXiv preprint arXiv:2410.07268 (2024). DOI: https://doi.org/10.48550/arXiv.2410.07268
K.-J. Wang, H.-W. Tung, **Z. Huang,** P. Thakur, Z.-H. Mao, M.-X. You. 2018. *EXGbuds: Universal Wearable Assistive Device for Disabled People to Interact with the Environment Seamlessly*, In **HRI'18 Companion**, March 5-8, 2018, Chicago, IL, USA. ACM, NY, IEEE, NY, USA, 2018. pp. 369–370. DOI: https://doi.org/10.1145/3173386.3177836
K. Wang, K. You, F. Chen, **Z. Huang,** and Z. Mao. 2017. *Human-machine interface using eye saccade and facial expression physiological signals to improve the maneuverability of wearable robots*, **In 2017 International Symposium on Wearable Robotics and Rehabilitation (WeRob)**, 2017, pp. 1-2. DOI: https://doi.org/10.1109/WEROB.2017.8383845
K. Wang, K. You, F. Chen, **Z. Huang,** and Z. Mao. 2017. *Human-machine interface using eye saccade and facial expression physiological signals to improve the maneuverability of wearable robots*, **In 2017 International Symposium on Wearable Robotics and Rehabilitation (WeRob), 2017**, pp. 1-2. DOI: https://doi.org/10.1109/WEROB.2017.8383845
H. Shu, X. Wang and **Z. Huang.** 2015. *Identification of multivariate system based on PID neural network*, 2015 Sixth International Conference on Intelligent Control and Information Processing (ICICIP), 2015, pp. 199-202. DOI: https://doi.org/10.1109/ICICIP.2015.7388168

Awards and Honors

2016	Guangzhou University Outstanding Undergraduate Student
2016	Guangzhou University Best Undergraduate Project Award (3rd/149)
2016	Guangzhou University Best Innovation Award of the Undergraduate Project (1st/149)
2012-2016	Guangzhou University Scholarship for Undergraduate Student (Every year)

Skills and Qualifications

Proficient in Python, C++, Pytorch, TensorFlow, ROS, TensorRT and CUDA programing.
Fluent in English and Mandarin.

Research Interests

Autonomous Driving, Computer Vision, Deep Learning, Object Detection, Depth Estimation, Sensor Fusion.