Binjian **Xin**

DEEP LEARNING · AUTONOMOUS DRIVING · SOFTWARE DESIGN

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"Decoding ≠ Interpretation, Abstraction = Understanding"

Education

KIT (University of Karlsruhe)
Karlsruhe, Germany

PHD IN DEPARTMENT OF MEASUREMENT AND CONTROL ENGINEERING (MRT) · *Mar. 2002 - Jan. 2009*

- 3D image data analysis and defect detection[6],
- Image processing and visual inspection[14],
- Image sensor fusion[2],
- Project (Daimler-Benz)[16],
- Teaching activities.

Tongji University
Shanghai, China

MENG IN ROBOTICS · *Mar. 1998 - Sep. 2001*

- "Kinematic studies for a multimodal orthopaedic training simulator", TUM, Germany,[5]
- Study and research in evolutionary algorithms[3].

BENG IN CONTROL ENGINEERING · *Sep. 1993 - Sep. 1998*

- Bachelor work "Simulation of an adaptive Fuzzy-Logic System".

Experience

Newrizon
Shanghai, China

SENIOR TECHNICAL DIRECTOR · *Nov. 2020 - May 2024*

- Reinforcemnt learning based BEV controller optimization in multimodal complex environments (10% increase in energy efficiency)[13,14,9].
- Time series anomaly detection and battery state of safety prediction based on generative models.[11,12]
- Research in applications of multimodal foundation model and large language model in autonomous driving[7,8,10].
- Software design & development of streaming data pipeline for time sequence:
    - Online deep reinforcement learning data pipeline (ETL, Deep Learning Training/Inference pipelines) → **tspace** ⊙,
    - CAN Application package → **candycan** ⊙,
    - Time series analysis with generative AI → **funes-ts** ⊙.

Nio
Shanghai, China

SENIOR MANAGER · *Nov. 2017 - Nov. 2020*

- Advanced hardware and software design of L4 autonomous driving system.
- Team (10+ engineers) build-up and development management.
- Fleet: electric vehicles (10+) with level 4 sensor configuration and computing platform.
- Intelligent charging and automatic parking assistance system (public funded project).
- License application and operation of Intelligent Connected Vehicle (ICV) road test in Shanghai and Beijing.
- Top 3 at testing mileage in Beijing with T3 license.
- 5G ICV Demonstration in Hainan Boao Forum, 2019.

Patac/SAIC-GM
Shanghai, China

TECHNICAL MANAGER · *Oct. 2015 - Nov. 2017*

- System & software architecture design for active safety domain unit (ADU).
- PATAC ADU A sample: system and software architecture of embedded platform.
- Software architecture of SAIC-MAXUS SV73 highway assist.
- Camera based driver monitoring system.
- Surround view camera system[15].

Visteon Asian Pacific
Shanghai, China

SOFTWARE MANAGER · *Jan. 2015 - Aug. 2015*

- SOP project of instrument clusters.

Hella Electronics
Shanghai, China

SENIOR MANAGER · *Jul. 2014 - Jan. 2015*

- SOP project of BCM and PEPS.
- Platform project of PEPS, BCM, BSW.

Harman R&D Center

Senior Manager

- Development of video based ADAS system.
- SOP projects of camera based parking systems:
  - SOP of 3D surround view system (SVS) for Geely KC-1,
  - SOP of rear view camera deployment (Geely, Ssangyong, Tata, GM, Suzuki, Hyundai and VW).
- Supervision of ADAS advanced research:
  - LDW and FCW on infotainment platform,
  - Augmented navigation,
  - Moving object detection.
  - Design of surround view demo systems (Robot car and OEM vehicles) and demos (CES, Geneva Motor Show).

Skills

Programming	Python, C/C++, Html, Rust
Development	Literate Programming, Git, Numpy, Pandas, Parquet, Arrow, Pydantic, MongoDB, PostgreSQL, Emacs
Deep learning	Tensorflow, Pytorch, LLM, >10000h
DevOps	Github Actions, Gitlab CI/CD, Docker
Documenation	Hugo, LaTeX, Markdown, OrgMode
Languages	Chinese, English, German

Publications

Journal Articles

[1] Binjian Xin. "Multiscale analysis of rough groove textures for three-dimensional optical measurements". In: *Optical Engineering* 48.7 (2009), pp. 073602–073602.

[2] Xin, Binjian, Michael Heizmann, Sören Kammel, and Christoph Stiller. "Analysis of Image Sequences for the Inspection of Grinded Surfaces." In: *tm-Technisches Messen* 71.4 (2004), pp. 218–226.

[3] Xin, Binjian, Lei Wang, and Qidi Wu. "A review of research and application of Ant Colony System." In: *Journal of Tongji University: Natural Science* 30.7 (2002), pp. 82–87.

Conference Proceedings

[4] Binjian Xin. "Evaluation of two and a half dimensional surface data with form component and groove bands." In: *Machine Vision Applications in Industrial Inspection XV*. Vol. 6503. SPIE. 2007, pp. 95–104.

[5] M. Frey, R. Riener, R. Burgkart, and Xin, Binjian. "Robot based teaching system: The Munich knee simulator." In: *VDI BERICHTE*. Vol. 1679. VDI. 2002, pp. 491–496.

Book

[6] Binjian Xin. *Evaluation and characterization of 3d surface data with groove textures.* KIT Scientific Publishing, 2009.

Patents

[7] Binjian Xin. *Natural language interface and large language model based autonomous driving decision module.* Mar. 22, 2024.

[8] Binjian Xin. *Natural language interface and multimodal foundation model based autonomous driving desicion system.* Mar. 22, 2024. Applied.

[9] Hongchen Pan and Xin, Binjian. *Driving style classification method, apparatus, device, storage medium, and program.* Oct. 24, 2023.

[10] Binjian Xin. *Vehicle-mounted camera view-blocked area enhancement detection based on latent diffusion model.* May 30, 2023.

[11] Binjian Xin. *Battery safety detection method based on generative model.* Aug. 11, 2023.

[12] Xin, Binjian and Yang Chen. *Machine learning based time series feature generation and fault battery detection method and device.* Aug. 8, 2023.

[13] Binjian Xin. *Reward driven controller parameter optimization.* July 29, 2022. Pending.

[14] Xin, Binjian, Jingwei Fu, and Hongchen Pan. *Simulation based controller parameter design, testing and device.* Feb. 8, 2022.

[15] J. Fang, S. Li, L. Jin, Z. Xu, B. Cao, and Xin, Binjian. *A multi-camera based rear view system.* Mar. 29, 2017.

[16] J. Boehm, T. Hercke, N. Rau, S. Schweikert, A. Warzok, and Xin, Binjian. *Evaluation method for honed structures on motor cyliner bores*. Aug. 28, 2008.