



# Binjian Xin

DEEP LEARNING · AUTONOMOUS DRIVING · SOFTWARE DESIGN

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*"Decoding  $\neq$  Interpretation, Abstraction = Understanding"*

## Education

### KIT (University of Karlsruhe)

Karlsruhe, Germany

PHD WITH DEPARTMENT OF MEASUREMENT AND CONTROL ENGINEERING (MRT) IN IMAGE PROCESSING

Mar. 2002 - Jan. 2009

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

### Tongji University

Shanghai, China

MSC IN ROBOTICS

Mar. 1998 - Sep. 2001

- "Kinematic studies for a multimodal orthopaedic training simulator", TUM, Germany,<sup>5</sup>,
- Study and research in evolutionary algorithms<sup>3</sup>.

BSC IN ELECTRICAL ENGINEERING

Sep. 1993 - Sep. 1998

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

## Experience

### Newrizon

Shanghai, China

SENIOR TECHNICAL DIRECTOR, ADVANCED DEVELOPMENT

Nov. 2020 - May 2024

- Reinforcement learning based BEV controller optimization in multimodal complex environments (10% increase in energy efficiency)<sup>13149</sup>.
- Time series anomaly detection and battery state of safety prediction based on generative models.<sup>1112</sup>
- Research in applications of multimodal foundation model and large language model in autonomous driving<sup>7810</sup>.
- 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, AUTONOMOUS DRIVING

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, ADAS

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<sup>15</sup>.

### Visteon Asia 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, BSX.

- 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

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

## Publications

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### 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.