Junsheng Fu, Ph.D.

October 7, 2026
junsheng.fu@zenseact.com
https://scholar.google.com/citations?user=z3lud1UAAAAJ&hl=en



Employment History

2023 – present — **Technical Expert** at **Zenseact**, Sweden
- Lead research initiatives to ensure long-term competence in end-to-end driving.
- Give company-wide presentations and technical briefings to share knowledge and educate colleagues.
- Represent the company at major international scientific conferences, automotive events, and university collaborations.

2018 – 2023 — **Senior Algorithm Engineer** at **Zenseact** (previous Zenuity), Sweden
- Contributed to 3 projects from concept to product in road estimation and localization for autonomous driving.
- Led research projects and gave guest lectures at Universities.
- Mentored junior engineers and facilitated knowledge sharing within the team.

2012 – 2015 — **Computer Vision Researcher** at **Nokia Research**, Finland
- Designed and implemented a 3D Map Augmented Photo Gallery Application with HERE Map.
- Designed and implemented an Interactive Video Playback System with HERE Map.
- Filed 8 patents in EU and US.

Education

2014 – 2018 — **Ph.D. Computer Vision**, Tampere University, Finland. The PhD defense was conducted in 2022, due to relocation and disruptions caused by the COVID-19 pandemic.

2009 – 2012 — **M.Sc. Signal Processing**, Tampere University of Technology, Finland.

2005 – 2009 — **B.Eng. Telecommunication**, Hangzhou Dianzi University, China.

Research Supervision Experience

Postdoctoral researchers

2025 – present — **Dr. Yiping Xie**, **WASP Industrial PostDoc**, **2.2M SEK**, *Fusing Local Crowdsourced Maps to a Global HD Map*, co-supervised with Gustaf Hendeby at Linköping University and Erik Stenborg at Zenseact.

2023 – 2024 — **Dr. Yuxuan Xia**, **WASP Industrial PostDoc**, **2.2M SEK**, *Building HD Maps for Autonomous Driving Using Crowdsourcing*, co-supervised with Gustaf Hendeby at Linköping University and Erik Stenborg at Zenseact.

Industrial PhD students

2025 – present — **Luca Modica**, **Vinnova FFI Industrial PhD**, **5.1M SEK**, *Safe-VLA: Bridging Linguistic Reasoning andSafe Trajectory Planning for AutonomousDriving*, co-supervised with Richard Johansson and Moa Johansson at Chalmers.

2024 – present — **Ji Lan**, **Vinnova FFI Industrial PhD**, **12.2M SEK** for 3 PhD, *Deep Multimodal learning for Automotive applications*, co-supervised with Lars Hammarstrand at Chalmers.

2022 – present — **Adam Lilja**, **WASP Industrial PhD**, **2.4M SEK**, *MapSense: Self-supervised Multimodal Representation Learning and Online Mapping for Autonomous Driving*, co-supervised with Lars Hammarstrand at Chalmers.

Research Supervision Experience (continued)

Master Thesis (17 students)

2024
- **Sameer Jathavedan, Sheik Meeran Rasheed**, *SD Map Localization: A Deep Learning Approach*, the Department of Physics at Chalmers.

2023
- **Yubo Tian, Runjia Qian**, *Scalable HD Map Creation and Update Based on Crowdsourcing Data*, the Department of Electrical Engineering at Chalmers.
- **Ossian Eriksson**, *Bayesian Multi-Lane Road Geometry Estimation*, the Department of Electrical Engineering at Chalmers.
- **Amogha Udayakumar, Bragadesh Bharatwaj Sundararaman**, *Machine Learning based Lane level Localization*, the Department of Mathematical Sciences at Chalmers.
- **Karl Niwong, Sanna Amirijoo**, *Learning Based Road Estimation*, the Centre of Mathematical Sciences at the Faculty of Engineering, Lund University.

2022
- **Theodor Stenhammar, David Bejmer**, *Machine Learning Meets Localization: Hypothesis inference for localization of autonomous vehicles*, the Department of Computer Science and Engineering at Chalmers.
- **Gustav Böös, Cecilia Frank**, *Multi-SLAM: Crowdsourced HDmap elements*, the Department of Electrical Engineering at Chalmers.

2021
- **Adrian Fahlström-Svärd, Zacharias Hultman**, *Monocular Ego-vehicle Localization using High Definition Map*, the Department of Electrical Engineering at Chalmers.

2018
- **Albin Aronsson, Adam Eriksson**, *Ego Vehicle Localisation using LIDAR and Compressed Digital Maps*, the Department of Electrical Engineering at Chalmers.

Teaching and Invited Talks

Guest Lectures

2026
- **Engineering Physical AI for Autonomous Driving** at TU-Delft.

2025
- **Course: ACE055 Advanced Transportation Engineering** at Chalmers, *Driving the Future: Discovering the Technology Behind Autonomous Cars*.

2020
- **Course: TIA016 Digital Infrastructure** at the University of Gothenburg, *Shape the Future of Driving*.

2019
- **Course: TIA016 Digital Infrastructure** at the University of Gothenburg, *Digital Infrastructure for Autonomous Driving*.

Invited Talks

2026
- **ECCV 2026 Workshop WMEAI**, Opening Keynote: *What Should a World Model Represent in Autonomous Driving?*
- **Delft University of Technology, Intelligent Vehicles Lab**, *Engineering Physical AI for Autonomous Driving*, invited by Prof. Holger Caesar

2024
- **Polytechnic University of Turin**, *Advances in NeRFs, Road Estimation, and Mapping for Automated Driving Systems*, invited by Prof. Carla Fabiana Chiasserini
- **Scania**, *Research Work at Zenseact*.
- **KTH**, *Research Work at Zenseact*.
- **CEVT**, *Localization and Road Estimation in Autonomous Driving*.

2023
- **Shanghai Jiao Tong University**, *Localization and Road Estimation in Autonomous Driving*, invited by Prof. Weidong Chen.
- **Intelligent Transport Systems World Congress**, workshop keynote.

2022
- **Tampere University**, *Autonomous Driving System*, invited by Prof. Joni Kämäräinen.

Awards

2022 – 2025 **Zenseact Gold Inventor**, Sweden

2014 **Nokia Foundation Scholarship**, Finland.

2013 **Nokia Research SISU Award**, Finland.

2009 **Outstanding Graduate Award**, Zhejiang China.

Academic Service

- Reviewer for International Conferences: NeurIPS, ICRA, ICCV, CoRL, etc.

GitHub

- **Received 2,477 stars and 896 forks for my 17 open-source repositories**.
- **https://github.com/JunshengFu**.

Selected Publications

Thesis

1. **J. Fu**, "Camera pose estimation from street-view snapshots and point clouds," 2022.
2. **J. Fu**, "A real-time rate-distortion oriented joint video denoising and compression algorithm," 2011.

Journal

1. W. Hanling et al., "Vabus: Edge-cloud real-time video analytics via background understanding and subtraction," *IEEE Journal on Selected Areas in Communications* (***JSAC***), 2022.
2. **J. Fu**, S. Pertuz, J. Matas, and J.-K. Kämäräinen, "Performance analysis of single-query 6-dof camera pose estimation in self-driving setups," *Computer Vision and Image Understanding* (***CVIU***), 2019.

Conference

1. C. B. Lehocine, A. Lilja, **J. Fu**, and L. Hammarstrand, "Beyond chamfer distance: Granular order-aware evaluation metric for online mapping," in *40th Annual Conference on Neural Information Processing Systems* (***NeurIPS***), 2026.
2. A. Lilja, J. Lan, **J. Fu**, and L. Hammarstrand, "Queryocc: Query-based self-supervision for 3d semantic occupancy," in *IEEE / CVF Computer Vision and Pattern Recognition Conference* (***CVPR***), 2026.
3. W. Ljungbergh et al., "Gasp: Unifying geometric and semantic self-supervised pre-training for autonomous driving," in *IEEE/CVF Winter Conference on Applications of Computer Vision* (***WACV***), 2026.
4. B. Martens, S. Voloshyn, W. Liu, J. Vinkås, and **J. Fu**, "Sd-routefusion: End-to-end trajectory prediction using sd maps," in *29th International Conference on Information Fusion* (***FUSION***), 2026.
5. Z. Xia, M. Zaffar, **J. Fu**, A. Alahi, and J. F. P. Kooij, "Opencvl: An open, diverse, and large-scale dataset for fine-grained cross-view localization," in *19th European Conference on Computer Vision* (***ECCV***), 2026.
6. X. Yiping et al., "B^2f-map: Crowd-sourced mapping with bayesian b-spline fusion," in *IEEE International Conference on Robotics and Automation* (***ICRA***), 2026.
7. X. Bi et al., "Driving with context: Online map matching for complex roads using lane markings and scenario recognition," in *arXiv preprint arXiv:2505.05007*, 2025.

8. A. Lilja, E. Wallin, **J. Fu**, and L. Hammarstrand, "Exploring semi-supervised learning for online mapping," in *IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**) Workshop*, 2025.
9. M. Rafidashti, J. Lan, M. Fatemi, **J. Fu**, L. Hammarstrand, and L. Svensson, "Neuradar: Neural radiance fields for automotive radar point clouds," in *IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**) Workshop*, 2025.
10. Y. Jin, T. Stenhammar, D. Bejmer, A. Beauvisage, Y. Xia, and **J. Fu**, "Towards accurate ego-lane identification with early time series classification," in *27th International Conference on Information Fusion (**FUSION**)*, 2024.
11. A. Lilja, **J. Fu**, E. Stenborg, and L. Hammarstrand, "Localization is all you evaluate: Data leakage in online mapping datasets and how to fix it," in *IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**)*, 2024.
12. Y. Xia, E. Stenborg, **J. Fu**, and G. Hendeby, "Bayesian simultaneous localization and multi-lane tracking using onboard sensors and a sd map," in *27th International Conference on Information Fusion (**FUSION**)*, 2024.
13. M. Alibeigi et al., "Zenseact open dataset: A large-scale and diverse multimodal dataset for autonomous driving," in *IEEE/CVF International Conference on Computer Vision (**ICCV**)*, 2023.
14. **J. Fu**, L. Fan, K. Roimela, Y. You, and V.-V. Mattila, "A 3d map augmented photo gallery application on mobile device," in *IEEE International Conference on Image Processing (**ICIP**)*, 2014.
15. **J. Fu**, J.-K. Kämäräinen, A. G. Buch, and N. Krüger, "Indoor objects and outdoor urban scenes recognition by 3d visual primitives," in *Asian Conference on Computer Vision (**ACCV**)*, 2014.
16. **J. Fu**, L. Fan, Y. You, and K. Roimela, "Augmented and interactive video playback based on global camera pose," in *21st ACM International Conference on Multimedia (**ACMMM**)*, 2013.

Patents

1. S. M. R. A. RAHUMAN, S. JATHAVEDAN, A. BEAUVISAGE, **J. Fu**, and M. GRANATH, *Method for determining a current position of a vehicle on a navigation map*, US Patent App. 19/324,613, Mar. 2026.
2. **J. Fu** and A. Beauvisage, *Hypothesis inference for vehicles*, US Patent 12,227,195, Feb. 2025.
3. **J. Fu** and P. LOFTER, *Streetlight blocks enhanced adaptive high beam control*, US Patent App. 18/897,429, Mar. 2025.
4. A. Lilja, **J. Fu**, and L. Hammarstrand, *Road geometry estimation for vehicles*, US Patent App. 18/816,542, Mar. 2025.
5. O. Eriksson, L. Hammarstrand, Y. Xia, S. Madhusudhana, V. Kovbas, and **J. Fu**, *Model-based road estimation*, US Patent App. 18/739,846, Dec. 2024.
6. **J. Fu** and M. Buder, *Vehicle localization*, US Patent App. 18/621,667, Oct. 2024.
7. **J. Fu** and J. Ekmark, *Methods and apparatuses for adaptive high beam control for a vehicle*, US Patent App. 18/531,062, Jun. 2024.
8. **J. Fu**, E. Stenborg, and G. G. JAIME, *Operational design domain management for vehicles having automated driving systems*, US Patent App. 18/619,975, Oct. 2024.
9. **J. Fu** et al., *Vehicle localisation*, US Patent 12,085,403, Sep. 2024.
10. A. Beauvisage, **J. Fu**, T. Stenhammar, and D. Bejmer, *Determining a state of a vehicle on a road*, US Patent App. 18/317,185, Nov. 2023.
11. **J. Fu**, M. Olsson, V. Runemalm, and R. V. Carreño, *Estimation of a minimum overtaking speed of a vehicle*, US Patent 11,691,626, Jul. 2023.

12 **J. Fu** et al., *Vehicle pose assessment*, US Patent App. 18/193,258, Oct. 2023.

13 D. Liu and **J. Fu**, *Prediction of near-future behavior of road users*, US Patent App. 18/313,520, Nov. 2023.

14 M. K. VAKILZADEH, F. Zhennan, and **J. Fu**, *Method and system for estimation of an operational design domain boundary*, US Patent App. 17/994,705, Jun. 2023.

15 A. Eronen, J. Leppanen, A. Lehtiniemi, and **J. Fu**, *Monitoring*, US Patent 11,429,189, Aug. 2022.

16 **J. Fu**, F. Zhennan, and M. K. Vakilzadeh, *Unforeseen vehicle driving scenarios*, US Patent App. 17/586,910, Aug. 2022.

17 **J. Fu** and S. Xu, *Transitioning of vehicle speed control from an adas or ad system to a driver*, EP Patent App. 17/509,339, Oct. 2021.

18 **J. Fu**, M. Olsson, V. Runemalm, and R. V. Carreno, *Estimation of a minimum overtaking speed of a vehicle*, EP Patent App. 17/103,377, Nov. 2020.

19 **J. Fu**, A. Schindler, and B. Mattias, *Method, system, and vehicle for controlling a vehicle system*, EP Patent App. 17/069,122, Oct. 2020.

20 L. Fan, V.-V. Mattila, Y. You, K. Roimela, **J. Fu**, and A. Eronen, *Method and technical equipment for determining a pose of a device*, US Patent 10,102,675, Oct. 2018.

21 S. S. Mate, J. Leppanen, **J. Fu**, and P. Babahajiani, *Device with an adaptive camera array*, US Patent 9,996,934, Jun. 2018.

22 L. Fan, **J. Fu**, K. Roimela, and Y. You, *Method and apparatus for determining camera location information and/or camera pose information according to a global coordinate system*, US Patent 9,558,559, Jan. 2017.

23 L. Fan, **J. Fu**, K. T. Roimela, and Y. You, *Method and apparatus for determining camera location information and/or camera pose information according to a global coordinate system*, US Patent 9,699,375, Jul. 2017.

24 **J. Fu** and S. S. Mate, *Method and apparatus for generating a media capture request using camera pose information*, US Patent 9,596,404, Mar. 2017.

25 S. S. Mate, J. Leppanen, P. Babahajiani, and **J. Fu**, *Methods and apparatuses for directional view in panoramic content*, US Patent App. 14/586,286, Jun. 2016.

26 S. S. Mate and **J. Fu**, *Method and apparatus for media capture device position estimate-assisted splicing of media*, US Patent App. 14/095,569, Jun. 2015.