Renyuan Zhang (Leo), Ph.D.

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SF Bay Area

OBJECTIVE

Seeking full time engineer/researcher job on ADAS radar system, automotive radar vehicle integration, radar signal processing, radar-related machine learning, sensor fusion and radar target recognition.

EXPERIENCE

May 2022 – May 2023 **ADAS HW Specialist** *Lucid Motors* Newark, CA

- Staff Engineer, component owner of Lucid vehicles Short Range Radar system.
- Led the Lucid Gravity Short Range Radar ADAS system architecture defining, signal defining, diagnosis DID/DTC defining, sensor packaging, calibration requirements, ADAS feature defining and requirements, drafted production specifications, assembly work order, done FOV & KOZ simulations efforts.
- Worked with vendor on Lucid Gravity project timeline, SOW, maturity levels, sensor feature deliverables, sensor requirements.
- Worked on Lucid Air Short Range Radar sensor system diagnosis, calibration, EU and KSA market retrofit, fascia testing, fleet testing, and service team request.
- Led the Lucid Air vendor connections on SW releases, change requests, warranty and FA requests.
- Led designing Lucid in-house ADAS radar fascia, bracket, radar testing.
- Worked on Lucid level 4 autonomous driving sensor system architecture.

July 2021 – April 2022 **Hardware Engineer** *Weride* San Jose, CA

- Product level design of automotive radar. Led the blind spot radar sensor module development using Calterah mmWave AiP chips.
- Developed mmWave radar full signal processing chain using C++ on the programmable MMIC chip.
- Involved in in-house radar PCB design and mechanical enclosure radar radome design.
- Developed HW-SW data quality control with perception team.
- Evaluated new generation radar samples from different vendors and adapted to new POC vehicle sensor builds.

May 2019 – May 2021 **Hardware Engineer** *Lyft Inc. (Level 5)* Palo Alto, CA

- Led the radar sensor module and submodule characterization, testing and algorithm verification from different vendors.
- Proposed algorithms, configured and calibrated radar sensor on for on-vehicle system. Development online calibration for point cloud based automotive radars.
- Delivered the radar sensor ERS, IQC and KPIs for verification and functional requirements.
- Involved in developing radar early fusion algorithms.
- Developed C++ based data quality improvement algorithms for perception including tracking, calibration, interference mitigation and clustering.
- Developed radar sensor diagnostic tool for non-Tier 1 grade automotive radars.
- Developed binary tools for camera ISP tuning to perception ML outputs.
- Delivered part of automated ISP tuning algorithms and automated camera calibration system.

2015 – 2019 **Research Assistant** *University of Arizona* Tucson, AZ

- Maintained and developed the TI mmWave ROS interface (GitHub link)
- Achieved human behavior detection and recognition via CNN using micro-Doppler signatures by mmWave radar.
- Developed multi-target multi-input camera-radar sensor fusion and classification.

- Developed the mmWave sensing module for hospital ward surveillance including patient behavior recognition, tracking and target posture estimation.
- Researched non-synchronized incoherent MIMO radar angle resolution improvements.
- Optimized radar point cloud clustering and detection by machine learning method.
- Developed CUDA algorithms on radar signal processing.
- Researched on radar target clustering and classification.
- Realized radar interference detection, classification and mitigation using SVM.
- Improved automotive Radar Angular resolution using 3D Luneburg lens.
- Completed 3D imaging mmWave circular SAR using single transceiver and compressed sensing.

EDUCATION

2015 – 2019
Ph.D. in Electrical and Computer Engineering
University of Arizona
mmWave Radar: Enhancing Resolution, Target Recognition, and Fusion with Other Sensors

2013 – 2015
M.S. in Optical Sciences
University of Arizona
Fiber Based Spectral Domain Optical Coherence Tomography: Mechanism and Clinical Applications

2009 – 2013
B.S. in Optoelectronic Engineering
Chongqing University
Surface-Enhanced Raman Scattering Substrate Synthesis and Characterization

PUBLICATIONS

Patents

- *L269.USNP00* **R. Zhang**, M. Emadi, A. Mostajeran, J. Izadian, "Sequential Clustering". (Filed 12/27/2019)
- *L334.USNP00* **R. Zhang**, M. Emadi, A. Mostajeran, J. Izadian, "Blind Online Calibration for Vehicle Radar". (Filed 12/30/2019)
- *L335.USNP00* **R. Zhang**, M. Emadi, A. Mostajeran, J. Izadian, "Adaptive Clutter Removal From Radar Images". (Filed 12/30/2019)
- *L338.USNP00* **R. Zhang**, M. Emadi, A. Mostajeran, J. Izadian, "Adaptive Gating for Radar Tracking". (Filed 12/30/2019)
- F. Deng, **R. Zhang**, *et al*., "System and Method for Angle Measurement," United States Patent application 20190353478.

Journal Articles

- **R. Zhang** and S. Cao, "Extending Reliability of mmWave Radar Tracking and Detection via Fusion with Camera," *IEEE Access*, vol. 7, pp. 137065-137079, 2019.
- A. Sengupta, **R. Zhang**, *et al*., "mm-Pose: Real-Time Human Skeletal Posture Estimation using mmWave Radars and CNNs," *IEEE Sensors Journal*, vol. 20, no. 17, pp. 10032-10044, 2020.
- **R. Zhang** and S. Cao, "Real-time Human Motion Behavior Detection via CNN using mmWave Radar," *IEEE Sensors Letters*, vol. 3, no. 2, pp. 1-4, 2019.
- **R. Zhang** and S. Cao, "3D Imaging Millimeter Wave Circular Synthetic Aperture Radar," *Sensors*, vol. 17, no. 6, pp. 1419, June 2017.

Conference Proceedings

- **R. Zhang** and S. Cao, "Non-Synchronized Integration using Multiple Radars via Least Squares Fitting," *2019 IEEE National Aerospace and Electronics Conference (NAECON)*, Dayton, OH, 2019, pp. 694-697.

- **R. Zhang** and S. Cao, "Robust and Adaptive Radar Elliptical Density-Based Spatial Clustering and Labelling for mmWave Radar Point Cloud Data," *2019 53rd Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, pp. 919-924.
- F. Jin, **R. Zhang**, *et al.*, "Multiple Patients Behavior Detection in Real-time using mmWave Radar and Deep CNNs," *2019 IEEE Radar Conference*, Boston, MA, 2019, pp. 1-6.
- **R. Zhang** and S. Cao, "Support vector machines for classification of automotive radar interference," *2018 IEEE Radar Conference (RadarConf18)*, Oklahoma City, OK, 2018, pp. 0366-0371.
- **R. Zhang** and S. Cao, "Compressed Sensing For Portable Millimeter Wave 3D Imaging Radar," *2017 IEEE Radar Conference (RadarConf)*, Seattle, WA, 2017, pp. 0663-0668.
- **R. Zhang** and S. Cao, "Portable Millimeter Wave 3D Imaging Radar," *2017 IEEE Radar Conference (RadarConf)*, Seattle, WA, 2017, pp. 0298-0303.

SKILLS

ADAS | Automotive Radar | Sensor System | Autonomy

C/C++ | Python | Matlab | Shell | Source Control | Algorithm Development | Data Analysis

FMCW | MIMO | DSP | Radar DSP | Waveform Design | Image Processing | Computer Vision | Sensor Networking | Sensor Fusion | Machine Learning | Denoising | Target Recognition

MISCELLANEOUS

2020 IEEE Sensors Letters Best Paper Award
Real-Time Human Motion Behavior Detection via CNN Using mmWave Radar

Public Repo
The TI mmWave ROS interface which is used by many mmWave radar research groups worldwide (GitHub)

Reviewer
- IEEE Transactions on Signal Processing
- IEEE Sensors Journal
- IEEE Radar Conference