Zhengyu **Peng**

Senior Radar Systems Engineer · Ph.D.
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Summary

Senior radar systems engineer with the expertises in automotive radar systems, RF/microwave systems, RF IC design, and antenna array.

Experience

Aptiv *Kokomo, IN*
Senior Radar Systems Engineer *Jun. 2018 - PRESENT*

- Design and build next generation radar systems for active safety and autonomous vehicles

MDPI Remote Sensing Journal -
Guest Editor *Mar. 2019 - Dec. 2019*

- Guest editor for *Remote Sensing* journal special issue: Radar Remote Sensing on Life Activities

Mitsubishi Electric Research Labs. (MERL) *Cambridge, MA*
Research Internship *May 2017 - Aug. 2017*

- Designed novel digital beamforming transmitter architectures for radars and communication systems aiming to reduce hardware complexity and power consumption
- Completed simulation evaluation and initial schematic design

Skills

Simulation	CST, ADS, AWR, HFSS
Circuit Design	Virtuoso, Allegro, OrCAD
Programming	MATLAB, LabVIEW, Python, Java, C/C++, Verilog
Measurement	RF Anechoic Chamber, VNA, Spectrum Analyzer, Oscilloscope

Education

Texas Tech University *Lubbock, TX*
Ph.D. in Electrical Engineering *Aug. 2014 - May 2018*

Zhejiang University *Hangzhou, China*
M.Sc. in Information Science and Electronic Engineering *Aug. 2011 - Mar. 2014*

Zhejiang University *Hangzhou, China*
B.Sc. in Information Science and Electronic Engineering *Aug. 2007 - Jun. 2011*

Honors & Awards

2018	**Outstanding Reviewer**, IEEE Instrumentation and Measurement Society	–
2018	**Travel Fellowship**, U.S. National Committee for the International Union of Radio Science	*Boulder, CO*
2017	**Horn Professor's Graduate Achievement Award**, Texas Tech University	*Lubbock, TX*
2016	**Graduate Fellowship**, IEEE Microwave Theory and Techniques Society	*San Francisco, CA*
2016	**Finalist**, IEEE Radio Wireless Week Student Paper Competition	*Austin, TX*
2016	**Excellent Demo Track**, IEEE Radio Wireless Week	*Austin, TX*
2015	**Third Place**, IEEE IMS High Sensitivity Radar Competition	*Phoenix, AZ*

Professional Activities

Journal Reviewer

- Scientific Reports
- IEEE Sensors Letters
- IEEE/ASME Transactions on Mechatronics
- IEEE Transactions on Biomedical Engineering
- International Journal of Microwave and Wireless Technologies
- IEEE Access
- IEEE Transactions on Microwave Theory and Techniques
- IEEE Transactions on Instrumentation and Measurement
- IEEE Transactions on Circuits and Systems I: Regular Papers
- IEEE Transactions on Circuits and Systems II: Express Briefs
- IEEE Transactions on Mobile Computing
- IEEE Transactions on Vehicular Technology
- IEEE Antennas and Wireless Propagation Letters
- IEEE Microwave and Wireless Components Letters
- IEEE Microwave Magazine
- IEEE Sensors Journal
- IEEE Journal of Electromagnetics, RF, and Microwaves in Medicine and Biology
- IEEE Journal on Emerging and Selected Topics in Circuits and Systems
- IETE Journal of Research
- Sensors and Actuators A: Physical
- Sensors
- Electronics
- Remote Sensing
- Algorithms
- Applied Sciences
- Symmetry
- Information
- Mathematical and Computational Applications
- Advances in Science, Technology and Engineering Systems Journal
- Computers in Biology and Medicine
- Engineering Applications of Artificial Intelligence
- Expert Systems With Applications
- AEÜ - International Journal of Electronics and Communications
- Wind Energy

- ACES Journal

Conference Technical Program Committee Reviewer

- 2019 International Applied Computational Electromagnetics Society (ACES) Symposium
- 2018 IEEE International RF and Microwave Conference
- 2018 World of Multidisciplinary Research and Application Conference
- 2018 Advanced Research in Eng. and Info. Technology International Conference
- 2018 Symposium on Islamic Sciences and Technology
- 2018 World Congress on Circuits and Systems Conference
- 2017 Asia Pacific Microwave Conference

Publications

Book Chapters

[1] **Z. Peng**, C. Li, J.-M. Muñoz-Ferreras, and R. Gómez-García, "Chapter 9: Hardware Development and Applications of Portable FMCW Radars," in *Micro-Doppler Radar and its Applications*, F. Fioranelli, H. Griffiths, M. Ritchie, and A. Balleri, Eds. Raleigh, NC: SCITECH PUB, 2020.

[2] **Z. Peng**, C. Li, R. Gómez-García, and J.-M. Muñoz-Ferreras, "Chapter 5: FMCW Radar System for Short-Range Micro-Motion Sensing," in *Short-Range Micro-Motion Sensing: Hardware, signal processing, and machine learning*, C. Gu and J. Lien, Eds. Raleigh, NC: SCITECH PUB, 2019.

[3] R. Gómez-García, D. Psychogiou, **Z. Peng**, J.-M. Muñoz-Ferreras, and C. Li, "Chapter B.3: Adaptive RF multi-interference suppression for radar/wireless-communication wideband receivers," in *Radar and Communications Spectrum Sharing*, S. Blunt and E. Perrins, Eds. Raleigh, NC: SCITECH PUB, 2018.

Journal Articles

[1] D. Tang, J. Wang, W. Hu, **Z. Peng**, Y.-C. Chiang, and C. Li, "A DC-coupled high dynamic range biomedical radar sensor with fast-settling analog DC offset cancellation," *IEEE Transactions on Instrumentation and Measurement*, vol. 68, no. 5, pp. 1441–1450, May 2019.

[2] **Z. Peng** and C. Li, "Portable microwave radar systems for short-range localization and life tracking: A review," *Sensors*, vol. 19, no. 5, p. 1136, Mar. 2019.

[3] Y. Li, **Z. Peng**, R. Pal, and C. Li, "Potential active shooter detection based on radar micro-Doppler and range-doppler analysis using artificial neural network," *IEEE Sensors Journal*, vol. 19, no. 3, pp. 1052–1063, Feb. 2019.

[4] J. Yan, **Z. Peng**, H. Hong, C. H, X. Zhu, and C. Li, "Vital-SAR-imaging with a drone-based hybrid radar system," *IEEE Transactions on Microwave Theory and Techniques*, vol. 66, no. 12, pp. 5852–5862, Dec. 2018.

[5] **Z. Peng** and C. Li, "A portable K-band 3-D MIMO radar with non-uniformly spaced array for short-range localization," *IEEE Transactions on Microwave Theory and Techniques*, vol. 66, no. 11, pp. 5075–5086, Nov. 2018.

[6] **Z. Peng**, L. Ran, and C. Li, "A K-band portable FMCW radar with beamforming array for short-range localization and vital-Doppler targets discrimination," *IEEE Transactions on Microwave Theory and Techniques*, vol. 65, no. 9, pp. 3443–3452, Sep. 2017.

[7] J.-M. Muñoz-Ferreras, **Z. Peng**, R. Gómez-García, and C. Li, "Review on advanced short-range multimode continuous-wave radar architectures for healthcare applications," *IEEE Journal of Electromagnetics, RF and Microwaves in Medicine and Biology*, vol. 1, no. 1, pp. 14–25, Aug. 2017.

[8] C. Li, **Z. Peng**, T.-Y. Huang, T. Fan, F.-K. Wang, T.-S. Horng, J.-M. Muñoz-Ferreras, R. Gómez-García, L. Ran, and J. Lin, "A review on recent progress of portable short-range non-contact microwave radar systems," *IEEE Transactions on Microwave Theory and Techniques*, vol. 65, no. 5, pp. 1692–1706, May 2017.

[9] **Z. Peng**, J.-M. Muñoz-Ferreras, Y. Tang, R. Gómez-García, L. Ran, and C. Li, "A portable FMCW - interferometry radar with programmable low-IF architecture for localization, ISAR imaging and vital-sign tracking," *IEEE Transactions on Microwave Theory and Techniques*, vol. 65, no. 4, pp. 1334–1344, Apr. 2017.

[10] J.-M. Muñoz-Ferreras, **Z. Peng**, Y. Tang, R. Gómez-García, D. Liang, and C. Li, "Short-range Doppler-radar signatures from industrial wind turbines: Theory, simulations, and measurements," *IEEE Transactions on Instrumentation and Measurement*, vol. 65, no. 9, pp. 2108–2119, Sep. 2016.

[11] H. Hong, H. Zhao, **Z. Peng**, H. Li, C. Gu, C. Li, and X. Zhu, "Time-varying vocal folds vibration detection using a 24 GHz portable auditory radar," *Sensors*, vol. 16, no. 8, p. 1181, Aug. 2016.

[12] C. Gu, **Z. Peng**, and C. Li, "High-precision motion detection using low-complexity Doppler radar with digital post-distortion technique," *IEEE Transactions on Microwave Theory and Techniques*, vol. 64, no. 3, pp. 961–971, Mar. 2016.

[13] **Z. Peng**, J. Chen, Y. Dong, B. Zhang, D. Ye, J. Huangfu, Y. Sun, C. Li, and L. Ran, "Radio frequency beamforming based on a complex domain frontend," *IEEE Transactions on Microwave Theory and Techniques*, vol. 64, no. 1, pp. 289–298, Jan. 2016.

[14] J.-M. Muñoz-Ferreras, **Z. Peng**, R. Gómez-García, G. Wang, C. Gu, and C. Li, "Isolate the clutter: Pure and hybrid linear-frequency-modulated continuous-wave (LFMCW) radars for indoor applications," *IEEE Microwave Magazine*, vol. 16, no. 4, pp. 40–54, May 2015.

[15] R. Wang, D. Ye, S. Dong, **Z. Peng**, Y. Salamin, F. Shen, J. Huangfu, C. Li, and L. Ran, "Optimal matched rectifying surface for space solar power satellite applications," *IEEE Transactions on Microwave Theory and Techniques*, vol. 62, no. 4, pp. 1080–1089, Apr. 2014.

[16] **Z. Peng**, T. Hu, W. Cui, J. Huangfu, C. Li, and L. Ran, "Unconventional beamforming for quasi - hemispheric coverage of a phased array antenna," *IEEE Antennas and Wireless Propagation Letters*, vol. 12, pp. 1654–1657, Dec. 2013.

Conference Proceedings

[1] J.-M. Muñoz-Ferreras, **Z. Peng**, J. Wang, C. Li, and R. Gómez-García, "Coherent deramping-based multi-FMCW radar architecture," in *IEEE Topical Conference on Wireless Sensors and Sensor Networks (WiSNet)*, Orlando, FL, Jan. 20-23: 2019.

[2] **Z. Peng**, P. Nallabolu, and C. Li, "Design and calibration of a portable 24-GHz 3-D MIMO FMCW radar with a non-uniformly spaced array and RF front-end coexisting on the same PCB layer," in *13th IEEE Dallas Circuits and Systems Conference 2018 (DCAS)*, Dallas, TX, Nov. 12: 2018.

[3] Z. Li, Z. Yang, C. Song, C. Li, **Z. Peng**, and W. Xu, "E-eye: Hidden electronics recognition through mm-wave nonlinear effects," in *Proceedings of the 16th ACM Conference on Embedded Networked Sensor Systems (SenSys '18)*, Shenzhen, China, Nov. 4-7: 2018.

[4] S. Luo, T. Jiao, **Z. Peng**, Y. Li, and C. Li, "Mutual decoupling of four-element transmit- receive (T-R) antenna arrays based on a metamaterial isolation structure," in *2018 International Applied Computational Electromagnetics Society Symposium in China (ACES-China)*, Beijing, China, Jul. 29-Aug. 1: 2018.

[5] T. Jiao, **Z. Peng**, S. Luo, Y. Li, and C. Li, "Mutual coupling reduction in a T/R array with T-resonate cavity EBG (TRC-EBG)," in *IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting (AP-S/URSI)*, Boston, MA, Jul. 8-13: 2018.

[6] J.-M. Muñoz-Ferreras, J. Wang, **Z. Peng**, R. Gómez-García, and C. Li, "From Doppler to FMCW radars for non-contact vital-sign monitoring," in *2nd URSI Atlantic Radio Science Meeting (AT-RASC)*, Meloneras, Spain, May 28-Jun. 1: 2018.

[7] D. Tang, J. Wang, **Z. Peng**, Y.-C. Chiang, and C. Li, "A DC-coupled biomedical radar sensor with analog DC offset calibration circuit," in *IEEE International Instrumentation and Measurement Technology Conference (I2MTC)*, Houston, TX, May 14-17: 2018.

[8] **Z. Peng**, A. Mishra, J. Davis, J. Bridge, and C. Li, "Long-time non-contact water level measurement with a 5.8-GHz DC-coupled interferometry radar," in *IEEE International Instrumentation and Measurement Technology Conference (I2MTC)*, Houston, TX, May 14-17: 2018.

[9] J. Wang, **Z. Peng**, and C. Li, "An efficient and extended range tracking method using a hybrid FSK-FMCW system," in *IEEE MTT-S International Wireless Symposium (IWS)*, Chengdu, China, May 6-10: 2018.

[10] **Z. Peng**, K. Kim, P. Wang, R. Ma, K. Kihira, T. Fukasawa, C. Li, and B. Wang, "Code-division multiplexing based hardware reduction for a digital beamforming transmitter array," in *12th European Conference on Antennas and Propagation (EuCAP)*, London, UK, Apr. 9-13: 2018.

[11] **Z. Peng** and C. Li, "Intermodulation FMCW (IM-FMCW) radar for non-linear wearable targets detection," in *United States National Committee of URSI National Radio Science Meeting (USNC-URSI NRSM)*, Boulder, CO, Jan. 4-7: 2017.

[12] J. Yan, **Z. Peng**, H. Hong, X. Zhu, Q. Liu, B. Ren, and C. Li, "Indoor range-direction-movement sar for drone-based radar systems," in *IEEE Asia Pacific Microwave Conference (APMC)*, Kuala Lumpur, Malaysia, Nov. 13-16: 2017.

[13] **Z. Peng**, D. Psychogiou, and C. Li, "Investigation of the roles of filters for a harmonic FMCW radar," in *International Applied Computational Electromagnetics Society (ACES) Symposium*, Suzhou, China, Aug. 1-4: 2017.

[14] J.-M. Muñoz-Ferreras, **Z. Peng**, R. Gómez-García, and C. Li, "Tone-ranging-inspired architecture for short-range radars: Theory and simulations," in *International Applied Computational Electromagnetics Society (ACES) Symposium*, Suzhou, China, Aug. 1-4: 2017.

[15] Y. Li, **Z. Peng**, and C. Li, "Potential active shooter detection using a portable radar sensor with micro-Doppler and range-Doppler analysis," in *International Applied Computational Electromagnetics Society (ACES) Symposium*, Suzhou, China, Aug. 1-4: 2017.

[16] **Z. Peng**, J.-M. Muñoz-Ferreras, C. Li, and R. Gómez-García, "An FMCW radar sensor for human gesture recognition in the presence of multiple targets," in *IEEE International Microwave Bio-Conference (IMBioC)*, Göteborg, Sweden, May 15-17: 2017.

[17] J.-M. Muñoz-Ferreras, **Z. Peng**, Y. Tang, R. Gómez-García, and C. Li, "Doppler-radar-based short-range acquisitions of time-frequency signatures from an industrial-type wind turbine," in *IEEE Wireless Sensors and Sensor Networks (WiSNet)*, Phoenix, AZ, Jan. 15-18: 2017.

[18] J.-M. Muñoz-Ferreras, **Z. Peng**, R. Gómez-García, and C. Li, "A frequency-multiplexed Doppler-plus-FMCW hybrid radar architecture: Theory and simulations," in *IEEE Wireless Sensors and Sensor Networks (WiSNet)*, Phoenix, AZ, Jan. 15-18: 2017.

[19] Y. Tang, **Z. Peng**, and C. Li, "An experimental study on the feasibility of fall prevention using a wearable K-band FMCW radar," in *United States National Committee of URSI National Radio Science Meeting (USNC-URSI NRSM)*, Boulder, CO, Jan. 4-7: 2017.

[20] Y. Tang, **Z. Peng**, L. Ran, and C. Li, "iPrevent: A novel wearable radio frequency range detector for fall prevention," in *IEEE International Symposium on Radio-Frequency Integration Technology (RFIT)*, Taipei, Taiwan, Aug. 24-26: 2016.

[21] H. Zhao, **Z. Peng**, H. Hong, X. Zhu, and C. Li, "A portable 24-GHz auditory radar for non-contact speech sensing with background noise rejection and directional discrimination," in *IEEE International Microwave Symposium (IMS)*, San Francisco, CA, May 22-27: 2016.

[22] **Z. Peng**, J.-M. Muñoz-Ferreras, R. Gómez-García, and C. Li, "FMCW radar fall detection based on ISAR processing utilizing the properties of RCS, range, and Doppler," in *IEEE International Microwave Symposium (IMS)*, San Francisco, CA, May 22-27: 2016.

[23] **Z. Peng**, J.-M. Muñoz-Ferreras, R. Gómez-García, L. Ran, and C. Li, "24-GHz biomedical radar on flexible substrate for ISAR imaging," in *IEEE International Wireless Symposium (IWS)*, Shanghai, China, Mar. 14-16: 2016.

[24] J.-M. Muñoz-Ferreras, **Z. Peng**, C. Li, and R. Gómez-García, "Effects and mitigation of interference tones on coherent FMCW short-range radars," in *IEEE International Wireless Symposium (IWS)*, Shanghai, China, Mar. 14-16: 2016.

[25] **Z. Peng**, J.-M. Muñoz-Ferreras, Y. Tang, R. Gómez-García, and C. Li, "Portable coherent frequency-modulated continuous-wave radar for indoor human tracking," in *IEEE Topical Conference on Biomedical Wireless Technologies, Networks, and Sensing Systems (BioWireleSS)*, Austin, TX, Jan. 24-27: 2016.

[26] J.-M. Muñoz-Ferreras, **Z. Peng**, R. Gómez-García, and C. Li, "Random body movement mitigation for FMCW-radar-based vital-sign monitoring," in *IEEE Topical Conference on Bio-medical Wireless Technologies, Networks, and Sensing Systems (BioWireleSS)*, Austin, TX, Jan. 24-27: 2016.

[27] J.-M. Muñoz-Ferreras, **Z. Peng**, Y. Tang, R. Gómez-García, D. Liang, and C. Li, "A step forward towards radar sensor networks for structural health monitoring of wind turbines," in *IEEE Radio and Wireless Symposium (RWS)*, Austin, TX, Jan. 24–27: 2016.

[28] **Z. Peng** and C. Li, "A portable 24-GHz FMCW radar based on six-port for indoor human tracking," in *IEEE MTT-S International Microwave Workshop Series on RF and Wireless Technologies for Biomedical and Healthcare Applications (IMWS-BIO)*, Taipei, Taiwan, Sep. 21-23: 2015.

[29] **Z. Peng**, L. Ran, and C. Li, "A 24-GHz low-cost continuous beam steering phased array for indoor smart radar," in *IEEE 58th International Midwest Symposium on Circuits and Systems (MWSCAS)*, Fort Collins, CO, Aug. 2-5: 2015.

Patents

[1] B. Wang, **Z. Peng**, K.-J. Kim, P. Wang, R. Ma, and K. H. Teo, "Digital beamforming transmitter array system with hardware sharing and reduction," US 10 270 510, Apr. 2019.

[2] K.-J. Kim, **Z. Peng**, B. Wang, and K. H. Teo, "Beamforming transmission with analog hardware resource sharing," US 10 218 550, Feb. 2019.

[3] **Z. Peng**, C. Li, and L. Ran, "Complex domain beamforming system and methods relating thereto," WO 2 018 057 631, Sep. 2017.

[4] C. Li and **Z. Peng**, "24-GHz low-cost continuous beam steering phased array for indoor smart radar and methods relating thereto," WO 2 017 176 814, Apr. 2017.

[5] **Z. Peng**, L. Ran, and J. Huangfu, "A method for array antenna beam to achieve omni-directional coverage," CN 103 579 759, Aug. 2015.

[6] **Z. Peng**, L. Ran, and J. Huangfu, "Adaptive array antenna," CN 103 579 779, Jul. 2015.

[7] **Z. Peng** and J. Huangfu, "Near-field and far-field universal wireless charging tray antenna," CN 102 544 756, Oct. 2013.