

SHUNQIAO SUN

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Dept. of Electrical and Computer Engineering
The University of Alabama
Tuscaloosa, AL 35487

EDUCATION

Rutgers, The State University of New Jersey Piscataway, NJ
Ph.D. in Electrical and Computer Engineering Aug. 2011 – Dec. 2015
– Advisor: Prof. Athina Petropulu

Fudan University Shanghai, China
M.S. in Electrical Engineering Aug. 2008 – June 2011

Jiangnan University Wuxi, China
B.E. in Electrical Engineering Aug. 2000 – June 2004

EMPLOYMENT

The University of Alabama Tuscaloosa, AL
Assistant Professor, Dept. of Electrical and Computer Engineering Aug. 2019 – present

Aptiv Agoura Hills, CA
Radar Signal Processing Engineer, Technical Center Malibu Jan. 2016 – Aug. 2019

Mitsubishi Electric Research Labs (MERL) Cambridge, MA
Research Intern May 2015 – Aug. 2015

Cisco Systems, Cisco R&D Center (CRDC) Shanghai, China
Electrical Design Engineer Intern May 2010 – May 2011

Kinpo Electronics Shanghai, China
Hardware Engineer II July 2004 – Aug. 2008

HONORS & AWARDS

- IEEE Senior Member 2018
- **IEEE Aerospace and Electronic Systems Society Robert T. Hill Best Dissertation Award** 2016
- ECE Graduate Program Academic Achievement Award, Rutgers University 2016
- ECE Research Excellence Award, Rutgers University 2013
- Student Travel Grant to Intl. Conf. on Communications (ICC), IEEE Communications Society 2011
- The Third Prize Best Poster Award, IEEE INFOCOM 2011

RESEARCH FUNDING

- NOAA/UCAR and U.S. Dept. of Commerce grant for “Center for Remote Sensing of Snow and Soil Moisture” (Co-PI, \$250K, total \$5M, PI: Dr. Prasad Gogineni) Sept. 2019 – Aug. 2020

JOURNAL PUBLICATIONS

- S. Sun, A. P. Petropulu and H. V. Poor, “MIMO radar for ADAS and autonomous driving: Advantages and challenges,” *IEEE Signal Processing Magazine*, under review.
- S. Sun and A. P. Petropulu, “Waveform design for MIMO radars with matrix completion,” *IEEE Journal of Selected Topics in Signal Processing*, vol. 9, no. 8, pp. 1400-1414, 2015.
- S. Sun, W. U. Bajwa, and A. P. Petropulu, “MIMO-MC radar: A MIMO radar approach based on matrix completion,”

IEEE Trans. on Aerospace and Electronic Systems, vol. 51, no. 3, pp. 1839-1852, 2015.

- Y. Yu, S. Sun, R. N. Madan, and A. P. Petropulu, "Power allocation and waveform design for the compressive sensing based MIMO radar," *IEEE Trans. on Aerospace and Electronic Systems*, vol. 50, no. 2, pp. 898-909, 2014.
- S. Sun, X. Wang and W. Ni, "Distributed power control in cognitive radio networks under node packet delay constraints," *Journal of Fudan University: Natural Science*, vol. 50, no. 4, pp. 485-491, 2011.
- S. Sun and W. Ni, "Dynamic spectrum access algorithm based on the estimation of channel time," *Information and Electronic Engineering*, vol. 8, no. 4, pp. 489-494, 2010.

CONFERENCE PUBLICATIONS

- S. Sun, K. V. Mishra and A. P. Petropulu, "Target estimation by exploiting low rank structure in widely separated MIMO radar," in Proc. of *IEEE Radar Conference*, Boston, MA, April 22-26, 2019.
- S. Sun and A. P. Petropulu, "On waveform conditions in MIMO radars using matrix completion," in Proc. of *49th Annual Asilomar Conf. on Signals, Systems, and Computers*, Pacific Grove, CA, Nov. 8-11, 2015. **(Invited)**
- S. Sun and A. P. Petropulu, "On transmit beamforming in MIMO radar with matrix completion," in Proc. of *IEEE 40th Intl. Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, Brisbane, Australia, April 2015.
- S. Sun and A. P. Petropulu, "On waveform design for MIMO radar with matrix completion," in Proc. of *IEEE Global Conference on Signal and Information Processing (GlobalSIP)*, Information Processing for Big Data Symposium, Atlanta, GA, Dec. 3-5, 2014.
- S. Sun and A. P. Petropulu, "On the applicability of matrix completion on MIMO radars," in Proc. of *48th Annual Asilomar Conference on Signals, Systems, and Computers (Asilomar)*, Pacific Grove, CA, Nov. 2-5, 2014. **(Invited)**
- D. S. Kalogerias, S. Sun, and A. P. Petropulu, "Sparse sensing in colocated MIMO radar: A matrix completion approach," in Proc. of *IEEE 13th International Symposium on Signal Processing and Information Technology (ISSPIT)*, Athens, Greece, Dec. 12-15, 2013. **(Invited)**
- S. Sun, A. P. Petropulu, and W. U. Bajwa, "High-resolution networked MIMO radar based on sub-Nyquist observations," in *Signal Processing with Adaptive Sparse Structured Representations Workshop (SPARS)*, EPFL, Lausanne, Switzerland, July 8-11, 2013.
- S. Sun, A. P. Petropulu, and W. U. Bajwa, "Target estimation in colocated MIMO radar via matrix completion," in Proc. of *IEEE 38th Intl. Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, Vancouver, Canada, May 2013.
- Y. Yu, S. Sun and A. P. Petropulu, "A Capon beamforming method for clutter suppression in colocated compressive sensing based MIMO radar," *SPIE Defense, Security, and Sensing*, Baltimore, MD, April 29-May 3, 2013.
- S. Sun and A. P. Petropulu, "Robust beamforming via matrix completion," in Proc. of *47th Annual Conference on Information Sciences and Systems (CISS)*, Baltimore, MD, March 20-22, 2013.
- S. Sun, W. Ni and Y. Zhu, "Robust power control in cognitive radio networks: A distributed way," in Proc. of *IEEE Intl. Conference on Communications (ICC)*, Kyoto, Japan, June 5-9, 2011. **(Student Travel Grant)**
- S. Sun, W. Ni and Y. Zhu, "Robust distributed power control in cognitive radio networks," in Proc. of *30th IEEE Intl. Conference on Computer Communications (INFOCOM)*, Shanghai, China, April 10-15, 2011. **(The Third Prize Best Poster Award)**
- S. Sun, J. Di and W. Ni, "Distributed power control based on convex optimization in cognitive radio networks," in Proc. of *2nd Intl. Conference on Wireless Communications and Signal Processing (WCSP)*, Suzhou, China, Oct. 21-23, 2010.

PRESENTATIONS

- Target estimation by exploiting low rank structure in widely separated MIMO radar
IEEE Radar Conference, Boston, MA, April 22-26, 2019.
- The advantages and challenges of MIMO radar for autonomous driving
California State University at Long Beach (CSULB), Long Beach, CA, Mar. 29, 2019.
- MIMO radar and its role in autonomous driving
IEEE Communications Society (ComSoc) Webinar, July, 2018.

- Make self-driving cars see! The key MIMO radar technology for autonomous driving
Michigan State University, East Lansing, MI, Mar., 2018.
- MIMO radar: Fundamentals, sparse sensing and its application in autonomous driving (Part II)
IEEE Buena Ventura Section Seminar, Skyworks Solutions, Newbury Park, CA, Nov., 2017.
- MIMO radar: Fundamentals, sparse sensing and its application in autonomous driving (Part I)
IEEE Buena Ventura Section Seminar, Skyworks Solutions, Newbury Park, CA, Sept., 2017.
- On waveform conditions in MIMO radars using matrix completion
49th Annual Asilomar Conf. on Signals, Systems, and Computers, Pacific Grove, CA, Nov., 2015.
- A Capon beamforming method for clutter suppression in colocated compressive sensing based MIMO radar
SPIE, Compressive Sensing for Radar, Baltimore, MD, April, 2013.
- Robust beamforming via matrix completion
47th Annual Conference on Information Sciences and Systems (CISS), Baltimore, MD, March, 2013.
- Power allocation for CS-based colocated MIMO radar systems
IEEE Sensor Array and Multichannel Signal Processing Workshop (SAM), Hoboken, NJ, June 2012.
- Robust power control in cognitive radio networks: A distributed way
IEEE Intl. Conference on Communications (ICC), Kyoto, Japan, June, 2011.
- Distributed power control based on convex optimization in cognitive radio networks
2nd Intl. Conference on Wireless Communications and Signal Processing (WCSP), Suzhou, China, Oct., 2010.

TEACHING

Instructor, Dept. of Electrical and Computer Engineering, The University of Alabama

- ECE 320: Fundamentals of Electrical Engineering Fall 2019

Teaching Assistant, Dept. of Electrical and Computer Engineering, Rutgers University

- ECE 521: Digital Signal and Filters Fall 2015, Fall 2014
- ECE 375: Elements of Electrical Engineering Spring 2015
- ECE 346/348: Digital Signal Processing and Labs Spring 2014
- ECE 231: Digital Logic Design Fall 2011

PROFESSIONAL SERVICES

Technical Committee (TC):

- Affiliate Member of IEEE Signal Processing Society Sensor Array and Multichannel (SAM) TC
- Affiliate Member of IEEE Signal Processing Society Machine Learning for Signal Processing (MLSP) TC

Technical Program Committee (TPC):

- IEEE International Workshop on Machine Learning for Signal Processing (MLSP), 2018
- IEEE ChinaSIP 2015, Multichannel and Array Signal Processing Track

Special Session Organizer:

- “Special Session on Recent Advances in Automotive Radar Systems” co-organized with Dr. Murtaza Ali, The Intl. Conference on Acoustics, Speech, and Signal Processing (ICASSP), May 2020
- “Special Session on Automotive Radar” co-organized with Dr. Athina Petropulu, Annual Asilomar Conf. on Signals, Systems, and Computers, Nov. 2019

Reviewer:

IEEE Trans. on Signal Processing, IEEE Trans. on Wireless Communications, IEEE Trans. on Aerospace and Electronic Systems, IEEE Trans. on Information Forensics and Security, IEEE Trans. on Vehicular Technology, IEEE Trans. on Computational Imaging, IEEE Trans. on Multimedia, IEEE Signal Processing Letters, IEEE Communications Letters, IEEE Access Journal, EURASIP Journal on Advances in Signal Processing, Signal Processing, Digital Signal Processing, IEEE Radar Conference, IEEE ICASSP, GLOBECOM, WCNC, VTC.