DAVID SCHVARTZMAN

CONTACT INFORMATION	ADDRESS: 604 Maple Hill Rd, Norman, OK 73069. MOBILE: +1(405) 371-9458 E-MAIL: dschvart@ou.edu

PROFESSIONAL INTERESTS

Radar Meteorology, Phased Array Radar, Digital Signal Processing, Artifical Intelligence/Machine Learning, Statistical Modeling and Simulations.

PROFESSIONAL EXPERIENCE

Advanced Radar Research Center (ARRC)
The University of Oklahoma   (April-2021 to Present)

RESEARCH SCIENTIST

- Investigate uses of radar technology for meteorological applications and develop projects to demonstrate them.
- Support the development, integration, and testing of new weather radar systems being developed at the ARRC.
- Conduct collaborative research and development of innovative beam pattern synthesis and signal-processing techniques to support the design of advanced weather scanning concepts with the all-digital PARs.
- Collaborate with other ARRC Faculty in the development and submission of research proposals.
- Explore uses of artificial intelligence and machine learning for meteorological applications.
- Work with undergraduate and graduate students to support their academic development in radar-related applications.

Cooperative Institute for Mesoscale Meteorological Studies (CIMMS)
The University of Oklahoma   (August-2015 to March-2021)

RESEARCH SCIENTIST

- Conduct collaborative research and development of innovative signal-processing and adaptive-sensing techniques to improve the quality, coverage, accuracy, and timeliness of meteorological products from weather radars.

- Exploration and demonstration of unique capabilities offered by evolutionary radars for weather observations; and the transferring of technology to existing radar systems in government, public, and private organizations.

- Member of the Advanced Radar Techniques (ART) team affiliated to the Radar Research and Development Division at the National Severe Storms Laboratory (NSSL).

Main projects include:

1. Advanced Technology Demonstrator (**ATD**) radar.
   - Digital signal processor: Integration and maintenance of the MATLAB implementation of the signal processor for the radar.
   - Support the implementation of radar calibration techniques: development of radar calibration techniques in collaboration with engineers from NSSL, MIT-Lincoln Laboratories and General Dynamics.

- Support the integration and testing of the ATD: development of simulations and signal processing software to test and integrate the system.

2. Development of a Command and Control radar simulator to inform the requirements for the Spectrum Efficient National Surveillance Radar (**SENSR**) Network.

   - Command and Control simulations: Development of a realistic time-series simulator capable of producing command and control volumetric scans emulating different weather radar architectures.
   - Provide critical information to NOAA-NWS decision makers that are evaluating radar architectures for a future WSR-88D radar replacement.

3. Development and testing of weather radar algorithms to improve the data quality of the Weather Surveillance Radar - 1988 Doppler (**WSR-88D**) network, in collaboration with the Radar Operations Center (ROC).

   - Development of signal processing techniques to improve the quality of operational dual-polarization weather radar data (ROC-NSSL Radar Product Improvement MOU).
   - Support the transferring and implementation of algorithms to the ROC.

School of Electrical and Computer Engineering, University of Oklahoma, OK, USA. (August-2019 to Present)

ADJUNCT INSTRUCTOR

- Instructor for the Circuits Laboratory course (ECE-3773)
- Responsible for teaching 3 credit hours per week, developing assignments, laboratory practices, midterms, projects, and final exams.

Advanced Radar Research Center (ARRC) (July-2013 to July-2015)

GRADUATE RESEARCH ASSISTANT

- Developed signal processing algorithms to perform adaptive weather sensing with Phased Array Radars (PAR).
- Implemented a spatio-temporal saliency models that incorporates a information-theory driven optimization for sensor resource management (e.g., scan time, number of beams, number of pulses per dwell, spatial sampling).

Millicom International Cellular S.A. (May-2011 to May-2013)

RF & CORE PLANNING ENGINEER

- CORE PLANNING (2G CAPACITY): Traffic analysis to control and manage the 2G radios resources (TRX) of the network. Analysis included calculating the traffic per layer (either 850 MHz or 1900 MHz) of the network and using the current parameters of the site and the given forecast, to calculate the number of TRXs to be needed in the sector.

- CORE PLANNING (3G/4G CAPACITY): Developed site deployment projects for the urban areas of the country, in collaboration with the rest of the team. Drafted the network growth planning for the next 5 years.

- RF PLANNING: Selection and Control of the candidate location for the 2G & 3G sites of the network, including coordinates of the site, heights of the antennas, structure to be used for the deployment.

EDUCATION   **School of Electrical and Computer Engineering, University of Oklahoma**, OK, USA.   (2016-2020)

Doctor of Philosophy in Electrical and Computer Engineering

- Dissertation Title: **Signal Processing Techniques And Concept Of Operations For Polarimetric Rotating Phased Array Radar**. Available online: https://shareok.org/handle/11244/326580.
- Committee Members: Dr. Tian-You Yu (chair), Dr. Sebastián Torres, Dr. Jorge Salazar, Dr. Mark Yeary, Dr. Ying Wang.
- Cumulative GPA of 4.00.
- Courses taken: RF and Microwave Engineering (A), Phased Array Antennas (A), Real-time Embedded DSP Architecture (A), Radar Cross Section (A), Management and Leadership skills for Engineers (A), Cloud and Precipitation Physics (A), Biomedical Signals and Systems (A).

Master of Science in Electrical and Computer Engineering (2013-2015)

- Graduate Research Assistant at the Advanced Radar Research Center (ARRC)
- Thesis Title: Weather Radar Spatio-Temporal Saliency.
- Committee Members: Dr. Tian-You Yu (chair), Dr. Sebastián Torres, Dr. Joseph Havlicek.
- Cumulative GPA of 4.00.
- Courses taken: Radar Engineering (A), Radar Signal Processing (A), Weather Radar Theory and Practice (A), Radar Polarimetry (A), Weather Radar Applications (A), Digital Image Processing (A), Applied Statistics (A).

School of Engineering, National University of Asunción, San Lorenzo, Paraguay.   (2006-2011)

- Electronics Engineer.
- Graduated with Summa Cum Laude Honors.
- Cumulative GPA of 4.96 out of 5.
- Study branch: Telecommunications.

DISTINCTIONS AND
AWARDS   **American Meteorological Society**, Norman, OK, USA.
- Recipient of the 2019 American Meteorological Society's Spiros G. Geotis Student Prize for the paper titled "Design of Practical Pulse Compression Waveforms for Polarimetric Phased Array Radar".
- Graduate of the 2020 American Meteorological Society's Early Career Leadership Academy (ECLA).

Gallogly College of Engineering, The University of Oklahoma, Norman, OK, USA.
- Dissertation Excellence Award.
- Graduate of the Jerry Holmes Leadership Program (JHLP, University of Oklahoma).

School of Engineering, National University of Asunción, San Lorenzo, Paraguay.
- Graduated Best of the Class 2011, with **Summa Cum Laude** Honors.
- Cumulative GPA of 4.96 out of 5.
- Study branch: Telecommunications.
- Member of the Honors Roll of admitted students (2006), School of Engineering, National University of Asunción.

CISCO NETWORKING ACADEMY: CISCO CERTIFIED NETWORKING ASSOCIATE
- Certificate of Approval: CCNA - Network Fundamentals

- Certificate of Approval: CCNA - Routing Protocols and Concepts
- Certificate of Approval: CCNA - LAN Switching and Wireless
- Certificate of Approval: CCNA - Accessing the WAN

OMAPA (Paraguayan Mathematical Olympiads)
- National Silver Medal (Level 3), 2005.
- National Gold Medal (Level 3), 2004.

UMALCA (Mathematical Union of Latin America and the Caribbean)
- International Course on *Real Analysis*, 2008
- Distinguished Student of the *Introduction to Probability* course, 2007
- Course on *Dynamic Systems*, 2007
- Course on *Number Theory and its applications to cryptography*, 2005

SERVICE

IEEE (Institute of Electrical and Electronic Engineers)
- Member of the Geoscience and Remote Sensing and Antennas societies.
- Reviewer for the IEEE Geoscience and Remote Sensing Society since 2017.
- Reviewer for the IEEE Antennas and Propagation Society since 2019.
- Member since 2009.

Sooners For Israel, US-Israel Relatioship Activism at the University of Oklahoma, http://soonersforisrael.org/ (2014-2016)
- Vice-President for Public Relations (Campus Relationships Coordinator). Link: http://soonersforisrael.org/

International Advisory Committee at the University of Oklahoma
- Internal Vice-President (2014-2015)
- Member (2013-2015)

University of Oklahoma Hillel Center
- Member of the Board of Directors (2015-Present)

COMPUTER
SOFTWARE

MATLAB, ANSYS HFSS, FEKO, Multisim, CS EAGLE, C, C++, SolidWorks, Linux shell, VHDL, Python.

Applications: TEX, LATEX, Microsoft Office, and other productivity packages common to Windows, MAC OS, and Linux platforms.

Operating Systems: MAC OS X, Linux, Microsoft Windows.

FORMAL
PUBLICATIONS

1. **Schvartzman, D.**, S.M Torres, and T.Y. Yu, 2021: **Integration of the Motion-Compensated Steering and Distributed Beams' Techniques for Polarimetric Rotating Phased Array Radar**. *IEEE Geoscience and Remote Sensing Letters*, https://doi.org/10.1109/LGRS.2021.3113564.

2. **Schvartzman, D.**, S.M Torres, and T.Y. Yu, 2021: **Motion-Compensated Steering (MCS): Enhanced Azimuthal Resolution for Polarimetric Rotating Phased Array Radar**. *IEEE Transactions on Geoscience and Remote Sensing*, https://doi.org/10.1109/TGRS.2021.3055033.

3. **Schvartzman, D.**, S.M Torres, and T.Y. Yu, 2021: **Distributed Beams: Concept of Operations for Polarimetric Rotating Phased Array Radar**. *IEEE Transactions on Geoscience and Remote Sensing*, https://doi.org/10.1109/TGRS.2020.3047090.

4. Weber, M., K. Hondl, N. Yussouf, Y. Jung, X. Wang, D. Stratman, T. Schuur, C. Kuster, Y. Wen, J. Sun, J. Keeler, Z. Ying, J. Cho, J. Kurdzo, S. Torres, C.

Curtis, **D. Schvartzman**, J. Boettcher, F. Nai, H. Thomas, D. Zrnić, I. Ivić, Djordje Mirković, C. Fulton, J. Salazar, G. Zhang, R. Palmer, M. Yeary, K. Cooley, M. Istok, and M. Vincent, 2020: **Towards the Next Generation Operational Meteorological Radar**. *Bulletin of the American Meteorological Society*, 102(7), E1357-E1383, https://doi.org/10.1175/BAMS-D-20-0067.1.

5. Zrnić, D., and **D. Schvartzman**, 2020: **Phase Codes for Mitigating ambiguities in Range and Velocity**. *Journal of Atmospheric and Oceanic Technology*, 38(2), 313-329, https://doi.org/10.1175/JTECH-D-20-0131.1.

6. Torres, S.M., and **D. Schvartzman**, 2020: **A Simulation Framework to Support the Design and Evaluation of Adaptive Scanning for Weather Radars**. *Journal of Atmospheric and Oceanic Technology*, 37, 2321-2339, https://doi.org/10.1175/JTECH-D-20-0087.1.

7. **Schvartzman, D.**, S.M. Torres, D. Warde, 2020: **The Hybrid-Scan Estimators: Exploiting WSR-88D Split Cuts to Improve the Quality of Polarimetric-Variable Estimates**. *Journal of Atmospheric and Oceanic Technology*, 37, 299-315, https://doi.org/10.1175/JTECH-D-20-0087.1.

8. Nai, F., J. Boettcher, C. Curtis, **D. Schvartzman**, and S. Torres, 2020: **The Impact of Elevation Sidelobe Contamination on Radar Data Quality for Operational Interpretation**. *Journal of Applied Meteorology and Climatology*, 59, 707–724, https://doi.org/10.1175/JAMC-D-19-0092.1.

9. **Schvartzman, D.**, C. Curtis, 2018: **Signal Processing and Radar Characteristics (SPARC) Simulator: A Flexible Dual-Polarization Weather-Radar Signal Simulation Framework Based on Preexisting Radar-Variable Data**. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, 12(1), doi: 10.1109/JSTARS.2018.2885614.

10. Torres, S.M., C.D. Curtis, and **D. Schvartzman**, 2017: **Requirement-Driven Design of Pulse Compression Waveforms for Weather Radars**. *Journal of Atmospheric and Oceanic Technology*, 34, 1351–1369, https://doi.org/10.1175/JTECH-D-16-0231.1

11. **Schvartzman, D.**, S. Torres, and T. Yu, 2017: **Weather Radar Spatiotemporal Saliency: A First Look at an Information Theory–Based Human Attention Model Adapted to Reflectivity Images**. *Journal of Atmospheric and Oceanic Technology*, 34, 137–152, doi: 10.1175/JTECH-D-16-0092.1.

12. BOOK SECTION: "An Introduction to Optimization" by Stanislaw Zak and Edwin Chong, Purdue University. Section written in the *Linear Programming* chapter. Mentioned by the authors on pages 440-447.

CONFERENCE
PAPERS

1. **Schvartzman, D.**, T.Y. Yu, S. Torres, 2021: **Motion-Compensated Steering for Polarimetric Rotating Phased-Array Radar: Can We Eliminate Beam Smearing?**. Paper 10-3, 37th Conference on *Environmental Information Processing Technologies*, 101st American Meteorological Society Annual Meeting, Virtual Event.

2. **Schvartzman, D.**, S. Torres, T.Y. Yu, I. Ivić, J. Murdock, 2021: **Distributed beams: Exploiting beamforming capabilities of a rotating phased-array radar system**. Poster 577, 37th Conference on *Environmental Information Processing Technologies*, 101st American Meteorological Society Annual Meeting, Virtual Event.

3. Ivić, I., and **D. Schvartzman**, 2021: **Experimental Evaluation of the PPAR Advanced Technology Demonstrator Calibration**. Paper 10-1, 37th Conference on *Environmental Information Processing Technologies*, 101st American Meteorological Society Annual Meeting, Virtual Event.

4. **Schvartzman, D.**, M. Weber, S. Torres, H. Thomas, D. Zrnić, I. Ivić, 2021: **Scanning Concepts and Architectures Supporting Rotating Meteorological Phased-Array Radar**. Paper 10-8, 37th Conference on *Environmental Information Processing Technologies*, 101st American Meteorological Society Annual Meeting, Virtual Event.

5. Warde, D., and **D. Schvartzman**, 2021: **Improved Meteorological Estimates for Polarimetric Weather Radars Using Hybrid Estimators**. Paper 11-7, 37th Conference on *Environmental Information Processing Technologies*, 101st American Meteorological Society Annual Meeting, Virtual Event.

6. Warde, D., I. Ivić, and **D. Schvartzman**, 2021: **Range-velocity ambiguity resolution with cross-coupling and range-overlaid mitigation for a phased array weather radar**. Poster 569, 37th Conference on *Environmental Information Processing Technologies*, 101st American Meteorological Society Annual Meeting, Virtual Event.

7. Torres, C. Curtis, N. Critser, E. Forren, S. Gregg, I. Ivić, R. Mendoza, **D. Schvartzman**, C. Schwarz, D. Wasielewski, A. Zahrai, 2021: **An Update on the Advanced Technology Demonstrator at the National Severe Storms Laboratory**. Paper 11-6, 37th Conference on *Environmental Information Processing Technologies*, 101st American Meteorological Society Annual Meeting, Virtual Event.

8. **Schvartzman, D.**, S. Torres, 2020: **Distributed beams: A technique to reduce the scan time of an active rotating Phased Array Radar system**. Paper 8B-2, 36th Conference on *Environmental Information Processing Technologies*, 100th American Meteorological Society Annual Meeting, Boston, MA, USA.

9. Ivić, I., and **D. Schvartzman**, 2020: **Weather Calibration Efforts on the Advanced Technology Demonstrator**. Paper 8B-4, 36th Conference on *Environmental Information Processing Technologies*, 100th American Meteorological Society Annual Meeting, Boston, MA, USA.

10. Torres, C. Curtis, E. Forren, S. Gregg, I. Ivić, R. Mendoza, **D. Schvartzman**, C. Schwarz, D. Wasielewski, A. Zahrai, 2020: **An Update on the Advanced Technology Demonstrator at the National Severe Storms Laboratory**. Paper 8B-1, 36th Conference on *Environmental Information Processing Technologies*, 100th American Meteorological Society Annual Meeting, Boston, MA, USA.

11. **Schvartzman, D.**, S. Torres, 2019: **Design of Practical Pulse Compression Waveforms for Polarimetric Phased Array Radar**. Paper 15A-02, *Extended Abstract, 39th International Conference on Radar Meteorology*, Nara, Japan.

12. Ivić, I., and **D. Schvartzman**, 2019: **A first look at the ATD data corrections**. Paper 2-06, *Extended Abstract, 39th International Conference on Radar Meteorology*, Nara, Japan.

13. Torres, S., T. Buckman, C. Curtis, E. Forren, S. Gregg, I. Ivić, R. Mendoza, **D. Schvartzman**, C. Schwarz, D. Wasielewski, A. Zahrai, 2019: **Towards an Operational Demonstration of the First Full-Scale Polarimetric Phased-Array Radar**. *39th International Conference on Radar Meteorology*, Nara, Japan.

14. Ivić, I., C. Curtis, E. Forren, R. Mendoza, **Schvartzman, D.**, S. Torres, D. J. Wasielewski and F. A. Zahrai, 2019: **An Overview of Weather Calibration on the Advanced Technology Demonstrator**. *Extended Abstract, IEEE International Symposium on Phased Array Systems and Technology*, Waltham, MA, USA.

15. Warde, D., C. Curtis, **D. Schvartzman**, and S. Torres, 2019: **Toward Improved Meteorological Estimates for Polarimetric Weather Radars**. *Preprints, 39th International Conference on Radar Meteorology*, Nara, Japan, poster.

16. **Schvartzman, D.**, S. Torres, 2018: **Are SENSR's temporal resolution requirements for the weather function feasible using adaptive scanning?**. *Preprints, 10th European Conference on Radar Meteorology and Hydrology*, Ede-Wageningen, The Netherlands, paper 8.21.

17. Torres, S., J. Boettcher, C. Curtis, F. Nai, **Schvartzman, D.** 2018: **Can an MPAR solution for SENSR meet all weather-surveillance mission-critical needs?**. *2018 IEEE Radar Conference (RadarConf18)*, Oklahoma City, OK, IEEE. Electronic ISSN: 2375-5318.

18. **Schvartzman, D.**, C. Curtis, 2017: **A Realistic Dual-Polarization Radar Time-Series Simulator Based on Archived Data**. *Preprints, 38th Conference on Radar Meteorology*, Chicago, IL, Amer. Meteor. Soc., Paper 196.

19. Nai, F., **D. Schvartzman**, C. Curtis, S. Torres, 2017: **Using Simulations to Refine Weather Surveillance Radar Requirements for SENSR**. *Preprints, 38th Conference on Radar Meteorology*, Chicago, IL, Amer. Meteor. Soc., Paper 209.

20. Warde, D., S. Torres, **D. Schvartzman**, 2017: **SZ-2 Algorithm Updates for the NEXRAD Network**. *Preprints, 38th Conference on Radar Meteorology*, Chicago, IL, Amer. Meteor. Soc., Paper 198.

21. Weber, M., I. Ivic, F. Nai, T. J. Schuur, **D. Schvartzman**, S. Torres, D. J. Wasielewski, N. Yussouf, A. Zahrai, R. J. Doviak, P. L. Heinselman, K. D. Hondl, L. J. Wicker, D. S. Zrnic, C. Fulton, R. D. Palmer, J. Salazar, G. Zhang, Y. Zhang, Y. Jung, M. Xue, X. Wang, J. Y. N. Cho, D. Conway, J. M. Kurdzo, H. Thomas, and T. Wallace, 2017: **Assessing the Weather Observation Capabilities of a Spectrum Efficient National Surveillance Radar (SENSR)**. *Preprints, 38th Conference on Radar Meteorology*, Chicago, IL, Amer. Meteor. Soc., Paper KS8.1.

22. **Schvartzman, D.**, D. Warde, S. Torres, 2017: **Hybrid-Scan Estimator: Using split cut data to improve the quality of polarimetric variables**. *Preprints, 33rd Conference on Environmental Information Processing Technologies*, Seattle, WA, Amer. Meteor. Soc., Paper 8A.2.

23. **Schvartzman, D.**, S. Torres, and T. Yu, 2015: **Spatio-temporal visual saliency for adaptive weather sensing using phased array radars**. *Preprints, 37th Conference on Radar Meteorology*, Norman, OK, Amer. Meteor. Soc., Paper 177.

24. Torres, S., C. Curtis, and **D. Schvartzman**, 2015: **A first look at combining pulse compression and range oversampling**. *Preprints, 37th Conference on Radar Meteorology*, Norman, OK, Amer. Meteor. Soc., Paper 2B.2.

25. **Schvartzman, D.**, T. Y. Yu, and S. Torres, 2015: **Spatio-temporal visual saliency for adaptive weather sensing**. *Proceedings, Progress In Electromagnetics Research Symposium*, Prague, Czech Republic, The Electromagnetics Academy, 2700-2704.

26. **Schvartzman, D.**, N. Mangiavacchi, G. Rabello: **Frontally colliding bubbles simulation using a two-dimensional dynamic mesh with ALE method.** In: *Workshop on Computational and Applied Mathematics for Engineering*, October 2010. Poster abstract.