



**IEEE Transactions  
on Radar Systems**

## CALL FOR PAPERS

**IEEE Transactions on Radar Systems (T-RS)**

***Special Section on Advances in Radar Imaging***

### **Aims and Scope**

Of the various radar operating modes, imaging arguably enjoys the widest breadth of utilization, involving myriad different use-cases spanning scientific remote sensing; medical diagnostic tools; automotive, weather, and other civil applications; and a host of defense/security applications. For instance, synthetic aperture radar (SAR) has advanced the field of archeology by facilitating the discovery of evidence of long-forgotten sites of human habitation, while also providing detailed information of ice sheet layers all the way down to the underlying bedrock. Micro-Doppler spectrograms can be used to monitor vital signs such as heartbeat, respiration, overall human motion, and even evaluate general fitness. Modern weather radar permits the characterization of different forms of precipitation and their density, while radar imaging is increasingly being viewed as a critical component of advanced driver-assistance systems (ADAS) to enhance automotive safety and ultimately facilitate autonomous driving. Finally, airborne/space-based SAR and ground-based inverse SAR (ISAR) for ship/aircraft identification serve a vital role in intelligence, surveillance, reconnaissance (ISR) operations by the defense community, while radar security scanning systems are becoming widespread as powerful tools for public safety.

Imaging can conceivably be performed across different combinations of the range, Doppler (slow-time or fast-time), spatial, or polarization domains, could employ single or multiple distributed platforms in bistatic/multistatic configurations, could leverage diverse/agile waveforms including multiple-input/multiple-output (MIMO) modes, and could even leverage illuminators of opportunity in a passive manner. Like all radars, imaging systems must also contend with an increasing proliferation of in-band interference while simultaneously seeking to achieve higher fidelity image quality. Consequently, this special section will explore the wide variety of radar imaging approaches and applications, thereby cross-fertilizing innovations across the diverse footprint of the radar research community.

### **Topics of Interest include:**

#### **All aspects of radar imaging techniques, system designs, and applications involving:**

- Real/synthetic/inverse aperture imaging in scientific, medical, civil, and defense/security applications
- Classification, identification, & change detection
- Radar tomography
- Interference mitigation/tolerance & spectral coexistence (in imaging context)
- Dual/multi-function with radar imaging
- MIMO & waveform-diverse radar imaging techniques
- Bistatic/multistatic imaging
- Passive imaging via illuminators of opportunity
- AI/ML methods (in imaging context)
- Polarimetric radar imaging
- Micro-Doppler characterization of motion
- Experimental demonstrations and prototypes of new radar imaging modalities (e.g. drone-borne)

### **Important Dates:**

Manuscript submission due: 15 October 2023  
First review completed: 29 November 2023  
Revised manuscript due: 29 December 2023  
Second review completed: 28 January 2024  
Final manuscript due: 12 February 2024  
Publication date: Spring 2024

Submitted manuscripts will be reviewed according to standard T-RS procedures for regular papers. Prospective authors should visit <https://iee.atyponrex.com/journal/tradar-ieee> for additional information. When submitting, use the category **Radar Imaging**. Manuscripts deemed to be outside the scope of the special section but otherwise still appropriate for T-RS will be redirected internally.