



IEEE Aerospace Electronic Systems

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- **Integrated Sensing And Communications (ISAC) initiative**

Radar Spectrum being released for commercial comms services

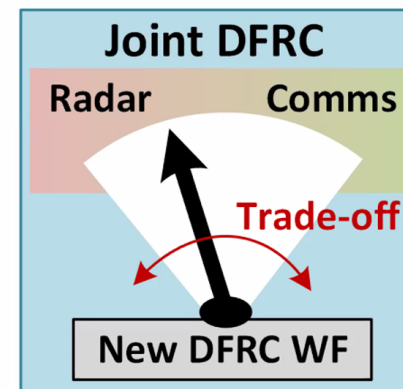
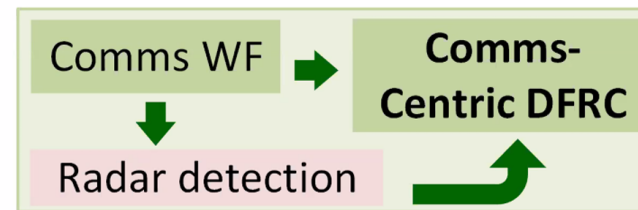
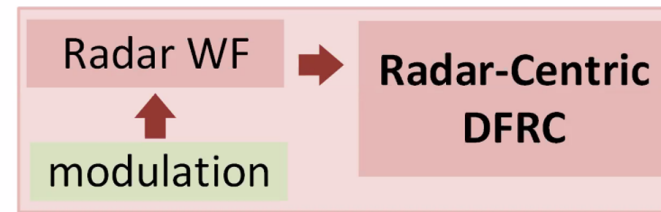


| Frequency Band | Radar Systems | Communication Systems |
|-------------------------|--|--|
| L-band (1-2GHz) | Long-range surveillance radar, ATC radar | LTE, 5G NR |
| S-band (2-4GHz) | Moderate-range surveillance radar, ATC radar, airborne early warning radar | IEEE 802.11b/g/n/ax/y WLAN, LTE, 5G NR |
| C-band (4-8GHz) | Weather radar, ground surveillance radar, vessel traffic service radar | IEEE 802.11a/h/j/n/p/ac/ax WLAN |
| MmWave band (30-300GHz) | Automotive radar, high-resolution imaging radar | IEEE 802.11ad/ay WLAN, 5G NR |

Source: C. Masouros «Integrated sensing and communications», webinar, ISAC ETI

DFRC Technologies

- Radar-centric design
 - Pulse Interval Modulation (PIM)
 - Radar beampattern sidelobe signalling
 - Index Modulation (IM) using radar waveforms
 - ...
- Comms-centric design
 - OFDM based DFRC
 - IEEE 802.11ad based DFRC
 - ...
- **Jointly optimized design**
 - Radar-centric joint design
 - Weighted Comms-Radar optimization
 - ...



IEEE ComSoc Integrated Sensing and Communication Emerging Technology Initiative (ISAC-ETI) and IEEE SPS Integrated Sensing and Communication Technical Working Group (ISAC-TWG)

SPECIFIC TASKS TO BE PERFORMED BY THE COMSOC ISAC-ETI AND SPS ISAC-TWG

- Establish the ISAC Newsletters - ISAC Focus. This includes the formation of the editorial board, creation of the article template, advertisement of the CFP, handling of the peer review, with distribution by ComSoc and SPS of the newsletters to different research communities
- Organize special issues on ISAC at top-tier IEEE journals and Transactions
- Organize workshops, special sessions, tutorials on ISAC at flagship conferences of IEEE ComSoc, and SPS
- Organize summer and winter (seasonal) ComSoc and SPS schools with the theme about ISAC
- Organize a joint ComSoc and SPS ISAC webinar series
- Organize dedicated ISAC conferences jointly sponsored by ComSoc and SPS
- For each task/event, representatives from ComSoc ISAC-ETI and SPS ISAC-TWG will work closely to make sure the task can be smoothly and successfully accomplished. ComSoc and SPS will advertise the above technical events and tasks at the direction of ISAC-ETI and SPS ISAC-TWG

- ▶ What AESS should do? Launch a similar initiative?
 - **Strengths:** We have the competencies (see, for instance, activities of RSP). This is also our field.
 - **Weaknesses:** We are a bit late. ComSoc and SPS started last year.
 - **Opportunities:** This is an excellent opportunity for the MID strategy. Creating a new initiative and/or joining the existing one we can strengthen our community and tighten our relation with SPS and ComSoc.
 - **Threats:** How should we proceed?