

## MathWorks Unveils New 6G Exploration Library at IMS 2024 Conference

*Company's Robust Presence at Leading Wireless Communications Conference Includes Multiple Workshops and Educational Seminars focused on 6G and Artificial Intelligence*

**Washington, DC – June 10, 2024** – [MathWorks](#), the leading developer of mathematical computing software, today announced plans to exhibit at next week's IMS 2024 conference in Washington, DC. IMS 2024 will bring together more than 500 companies and thousands of RF and microwave professionals to showcase the newest products and services and the latest wireless communications theories and strategies. In addition to hosting a variety of demos at booth #2139 in Hall B, MathWorks experts will be leading workshops and educational seminars with industry leaders throughout the event.

### EXHIBIT BOOTH DEMOS (Booth #2139)

RF and microwave professionals use [MATLAB®](#) and [Simulink®](#) to accelerate and optimize their wireless communications designs through modeling, simulation, testing, and implementation tools. IMS 2024 attendees have the opportunity to discuss several wireless communications workflows with MathWorks experts, including:

- **Exploring 6G waveforms, including over-the-air testing with MATLAB:** This demonstration will teach wireless engineers how to explore, design, and analyze candidate 6G candidate signals and waveforms. MATLAB's new [6G Exploration Library](#) enables engineers to easily configure and generate 6G waveform candidates, efficiently connect MATLAB to RF instruments or software-defined radios (SDRs), transmit the waveforms over the air, make signal quality measurements, and much more.
- **Wideband radar and communication waveform classification with Universal Software Radio Peripherals (USRPs):** This guided tour presents a real-time system for identifying 5G NR and RADAR signals, combining NI™ USRP™ SDR with deep learning. Attendees will work with multiple MATLAB products, including [Deep Learning Toolbox™](#), [Wireless Testbench™](#), [Image Processing Toolbox™](#), and [Communications Toolbox™](#).
- **5G waveform design and validation using MATLAB and Keysight test equipment:** Attendees will learn to use MATLAB apps, including [5G Toolbox™](#) and [Instrument Control Toolbox™](#), and command line functions to generate 5G NR test waveforms, transmit them OTA (over-the-air) using a signal generator, capture them with a Keysight signal analyzer, and analyze their EVMs.
- **Measuring RF filters with Keysight VNA, creating MATLAB behavioral models, and tuning filter performance:** RF and microwave professionals will learn how to control an instrument and acquire data in MATLAB, using [RF Toolbox](#), for visualization, analysis, and post-processing.

### Industry Workshops

IMS' industry workshops bring RF, microwave, and wireless leaders together to teach conference-goers valuable skills using the latest technologies. Here is a brief description of two industry workshops MathWorks experts are participating in:

- *Linearization of RF power amplifiers for wideband applications*  
Date: Tuesday, June 18  
Time: 10:10 – 11:50 am EDT

Location: 144C

Communications standards such as 5G, WLAN, SatCom, and radar systems all trend towards higher frequencies and larger signal bandwidths. These trends impose tight requirements on transmitter linearity and power amplifier efficiency. This workshop brings experts from MathWorks, Qorvo, Rohde & Schwarz, and AMCAD to introduce a workflow to combine state-of-the-art PA measurements with behavioral models and prototypes to accelerate the design, optimization, and testing of linearization techniques. The panel will introduce recent trends in PA architectures and identify linearization techniques such as DPD, also taking into account load-pull effects.

- *FPGA-Accelerated deep learning for 5G FR2 channel estimation*

Date: Thursday, June 20

Time: 1:30 – 3:10 pm EDT

Location: 144C

Increasing demand for high throughput, low latency, and ultra-reliability in wireless transmission requires accurate channel estimation under impairment conditions, including Doppler shifts and noise. Traditional techniques for channel estimation in 5G NR involve known pilot sequences inserted into the transmission from which the rest of the channel response can be interpolated across all sub-carriers. Experts from MathWorks, Rohde & Schwarz, Avnet, and Fujikura will demonstrate a convolutional neural network (CNN) for channel estimation using OTA measurements through mmWave PAAM and AMD RFSoc-based 5G NR receiver in a CATR chamber.

## Microapps Seminars

MathWorks experts will be leading nine IMS 2024 Microapps Seminars. Information on all of those presentations can be found [here](#), but here are a few highlighted seminars:

- *AI Classification of Waveform Types: Differentiating 5G NR and Radar Signals*

Date: Wednesday, June 19

Time: 2:35 – 2:45 pm EDT

Location: MicroApps Theater, Booth #2159

MathWorks Senior Engineering Manager Robin Getz explores the innovative use of AI for classifying waveform types, specifically distinguishing between 5G New Radio (NR) and RADAR signals. Attendees will gain insights into the application of advanced machine learning techniques for accurate classification and differentiation of these complex waveforms.

- *AI-based Digital Predistortion in MATLAB*

Date: Wednesday, June 19

Time: 2:45 – 3:00 pm EDT

Location: MicroApps Theater, Booth #2159

RF engineers must squeeze the last dB of performance from their transceiver front ends. For signals like Orthogonal Frequency Division Multiplexing (OFDM) with a high peak-to-average ratio (PAPR), that often means using techniques like digital predistortion (DPD) to compensate for power amplifier (PA) nonlinearities. Historically, DPD systems have been built using a Volterra series model of the PA. MathWorks Principal Technical Marketing Engineer Mike McLernon will show attendees that an AI-based DPD written in MATLAB can reduce the adjacent channel power ratio (ACPR) more than the Volterra series-based DPD.

## About MathWorks

MathWorks is the leading developer of mathematical computing software. MATLAB, the language of engineers and scientists, is a programming environment for algorithm development, data analysis, visualization, and numeric computation. Simulink is a block diagram environment for simulation and Model-Based Design of multidomain and embedded engineering systems. Engineers and scientists

worldwide rely on these products to accelerate the pace of discovery, innovation, and development in automotive, aerospace, communications, electronics, industrial automation, and other industries. MATLAB and Simulink are fundamental teaching and research tools in the world's top universities and learning institutions. Founded in 1984, MathWorks employs more than 6,000 people in 34 offices around the world. For additional information, visit [mathworks.com](http://mathworks.com).

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