

Workshop: Removing the Fear from AI for RF Design: How the Latest Tools Will Help You Keep Your Job as an RF Engineer

Workshop Coordinator: Ian Rippke, *Keysight Technologies*

Workshop Speakers:

Keysight Technologies – Matt Ozalas and Jason Boh [*Confirmed*]

Modelithics – Emiliano Marroquin and Larry Dunleavy [*Confirmed*]

Baylor University – Charles Baylis [*Confirmed*]

Workshop Abstract

Is AI coming for my career? How will I protect my detailed knowledge so that I stay relevant to the industry? Is everything that I've learned through trial and error over the last decade going to be irrelevant in the future?

Many engineers are asking themselves these same questions every time they see a new AI headline or read new marketing pitches on AI in the RF world. But fear not, because this workshop will demonstrate how AI tools in our industry will not only help you be more efficient and a better designer, but will help secure your place as a valued resource at your company.

Presentations:

Presentation 1: **“Capturing RF Design Knowledge to Practically Apply AI”**, Matt Ozalas, Keysight

Presentation 2: **“Agents, Skills, and MCPs, Oh My! - Building AI-Powered RF Design Tools”**, Jason Boh, Keysight

Presentation 3: **“The RF Design Agent Is Only as Good as Its Models: Trustworthy AI-Driven Front-End Development Flows”**, E. Marroquin and Larry Dunleavy, Modelithics

Presentation 4: **“Design Automation Using AI: Accurate Data Extrapolation for Design with RF Simulation Platforms”**, Charles Baylis, Austin Egbert, and Robert J. Marks, Baylor University

Paper Abstracts:

“Capturing RF Design Knowledge to Practically Apply AI”, Matt Ozalas, Keysight

Artificial intelligence has the potential to transform RF and microwave design, but its effectiveness depends on access to engineering knowledge, design intent, and proven workflows. This talk explores practical approaches for capturing and structuring RF design knowledge so it can be leveraged by AI assistants and automation tools. Attendees will learn how design data, simulation workflows, best practices, and domain expertise can be captured and structured so AI assistants can leverage them for design exploration, analysis, optimization, and documentation.

“Agents, Skills, and MCPs, Oh My! - Building AI-Powered RF Design Tools”, Jason Boh, Keysight

This presentation introduces key AI concepts relevant to RF engineers and demystifies terms such as agents, skills, and MCPs. It then walks through practical steps for using AI in day-to-day engineering work and building custom AI-powered tools and workflows for RF design.

“The RF Design Agent Is Only as Good as Its Models: Trustworthy AI-Driven Front-End Development Flows”, E. Marroquin and Larry Dunleavy, Modelithics

Building on the agent and MCP concepts in this workshop, this talk asks the practical question: when an AI agent drives an RF design, can you trust the result? We demonstrate an agent-guided flow that sets up and optimizes an example RF Design in ADS. The design flow relies on Modelithics measurement-based, highly scalable, models, so the output is first-pass correct in hardware. Run the same agent using idealized, or less accurate models and it confidently converges on a design that fails. The moral is that agents and AI optimization make a good engineer dramatically faster, and accurate, measurement-based models are what can rapidly turn an agent’s simulated prototype into actual working hardware.

“Design Automation Using AI: Accurate Data Extrapolation for Design with RF Simulation Platforms”, Charles Baylis, Austin Egbert, and Robert J. Marks, Baylor University

Many types of RF and microwave design, such as power amplifier design, require intelligent use of significant amounts of nonlinear test or simulation data to design. The design process is typically an art that is acquired through years of microwave engineering design experience. This presentation discusses how a Generative Adversarial Network can be used

to extrapolate data from a small number of simulated data points using image completion, allowing optima to be found much more quickly in a nonlinear amplifier design. The presentation will also discuss implementation of custom AI/ML code into RF/microwave design and simulation platforms to allow AI to be easily integrated into the design workflow. The presentation will also investigate how microwave engineers, and their expertise, will be needed in this new world of automated design and the emerging platforms that are supporting it.