Simulation Optimization Systems Research Laboratory

Space Mapping

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Welcome to the SOS Research Laboratory

Officer of the Order of Canada

The MTT-S 2004 Microwave Application Award

2012 IEEE Canada McNaughton Gold Medal

Queen Elizabeth II Diamond Jubilee Medal

Dr. John Bandler's Historical Note

Research in the Simulation Optimization Systems (SOS) Research Laboratory paved the way to the world's first statistical modeling/yield-driven design technology used within major CAD/CAE products. International research and industrial collaborations, including Optimization Systems Associates Inc. (OSA), founded by Dr. John W. Bandler, has been vital. Click here for publications. Click here for SOS reports. Click here for G-SOC reports for the years 1973-1983.

We collaborated in the creation of OSA's RoMPE^{TM}, HarPE^{TM} and OSA90/hope^{TM}, featuring the world's most powerful harmonic balance optimizer, as well as in Empipe^{TM}, Empipe3D^{TM}, EmpipeExpress^{TM}, *empath*^{TM} and the breakthrough Space Mapping and Geometry Capture technologies. The Empipe family became the foundation of Agilent HFSS Designer and Momentum Optimization (Agilent Technologies, now Keysight Technologies). See details of OSA's products for 1997, just before acquisition by Hewlett-Packard.

The world's most advanced family of L_1, L_2, Huber and minimax optimizers have been implemented in a friendly CAD environment. Pioneering software development for CAE, including design centering, optimal assignment of tolerances, postproduction tuning and production yield enhancement continues. We have worked on efficient techniques for large-scale optimization, active device parameter extraction, physics-based statistical device modeling and simulation, design centering and yield-driven design for GaAs microwave/millimeter-wave monolithic integrated circuits.

We have integrated optimization software with microwave measurement technology, full-wave electromagnetic (EM) simulators, and SPICE-like simulators.

Since 1993, we have focused on Space Mapping technology. This led to the development of the user-friendly Matlab-based system called SMF.

Our historical association with OSA and Bandler Corporation resulted in state-of-the-art commercial CAE software being available to us from many groups, most notably Sonnet Software, Inc., Ansoft Corporation (now ANSYS), Agilent Technologies (now Keysight Technologies), CST Computer Simulation Technology, and Faustus Scientific Corporation.