BANDLER CORPORATION

JOHN BANDLER'S ACHIEVEMENT MILESTONES

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Milestones 1

the following documents scientific, engineering and commercial achievements of John Bandler, with academic and professional colleagues and coworkers

computerized Smith chart plots (1966)

performance-driven optimization (1968)

optimization of waveguide circuits (1969)

adjoint sensitivities (1970)

cost-driven worst-case design with optimized tolerances (1972)

centering, tolerance assignment integrated with tuning at the design stage (1974)

integrated approach to microwave design with tolerances and uncertainties (1975)

yield-driven optimization for general statistical distributions (1976)

new results for cascaded circuits (1978)

optimal tuning and alignment at the production stage (1980)

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Milestones 2

fault diagnosis and parameter extraction (1980)

Bandler founds Optimization Systems Associates (OSA) (1983)

world's fastest multiplexer optimizer (1984)

introduction of powerful minimax optimizers into commercial CAD/CAE products such as EEsof's Touchstone (1985)

large-scale microwave optimization (1986)

foundation of multi-circuit L1 modeling (1986)

world's first yield-driven design for Compact Software's Super-Compact (1987)

enhancements to commercial CAD/CAE products including Compact Software's Microwave Harmonica (1988)

parameter extraction using novel large-scale concepts (1988)

nonlinear adjoint (harmonic balance) exact sensitivities (1988)

OSA's RoMPE, world's first commercial product for FET parameter extraction featuring S-parameters and/or DC data (1988)

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Milestones 3

yield-driven design of nonlinear microwave circuits (1989)

FAST, novel technique for high-speed nonlinear sensitivities (1989)

efficient large-signal FET parameter extraction using harmonics (1989)

OSA's HarPE, world's first commercial product for harmonic balance driven FET parameter extraction (1989)

combined discrete/normal statistical modeling of active devices (1989)

efficient quadratic approximation for statistical design (1989)

nonlinear circuit optimization with dynamically integrated physical device models (1990)

analytically unified DC/small-signal/large-signal circuit design (1990)

OSA's OSA90, world's first friendly optimization engine for performance- and yield-driven design (1990)

OSA's Datapipe Technology, OSA90's interprocess communication system (1990)

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Milestones 4

OSA's OSA90/hope, the microwave and RF harmonic optimization system (1991)

design optimization with external simulators, circuit-theoretic and field-theoretic (1991)

statistical modeling of GaAs MESFETs (1991)

gradient quadratic approximation for yield optimization (1991)

physics-based design and yield optimization of MMICs (1991)

OSA's Spicepipe connection of OSA90/hope with Zuberek's SPICE-PAC simulator (1992)

OSA's Empipe connection of OSA90/hope with Sonnet Software's *em* field simulator (1992)

predictable yield-driven circuit optimization (1992)

integrated physics-oriented statistical modeling, simulation and optimization (1992)

"fulfils the requirement of microwave engineers to model and simulate nonlinear active and passive systems without having a thorough knowledge of analysis, and optimization methods" - Microwave Engineering Europe (1992)

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Milestones 5

Datapipe connection of OSA90/hope with Hoefer's TLM electromagnetic field simulators (1993)

Datapipe connection of OSA90/hope with Nakhla/Zhang VLSI interconnect simulators (1993)

microstrip filter design using direct EM field simulation (1993)

yield-driven direct electromagnetic optimization (1993)

robustizing modeling and design using Huber functions (1993)

"CAD review: Non-linear CAD benchmark" by Microwave Engineering Europe (1993)

EM design of high-temperature superconducting microwave filters (1994)

CDF approach to statistical modeling (1994)

OSA's Space Mapping - a fundamental new theory for design with CPU intensive simulators (1994)

"CAD review: the 7 GHz doubler circuit" by Microwave Engineering Europe (1994)

optimization of planar structures with arbitrary geometry (1994)

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Milestones 6

OSA's breakthrough Geometry Capture technique (1995)

OSA's Aggressive Space Mapping for EM design (1995)

cost-driven physics-based large-signal simultaneous device and circuit design (1995)

integrated harmonic balance and EM optimization (1995)

novel heterogeneous parallel yield-driven EM CAD (1995)

mixed-domain multi-simulator statistical parameter extraction and yield-driven design (1995)

full-day MTT-S workshop on Automated Circuit Design Using Electromagnetic Simulators (Arndt, Bandler, Chen, Hoefer, Jain, Jansen, Pavio, Pucel, Sorrentino, Swanson, 1995)

explosion of development and use of optimization-based technology for automated circuit design with EM simulators (1994, 1995)

Network Datapipe connection of OSA90/hope with Hoefer's TLM electromagnetic field simulators on massively parallel computers (1995)

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Milestones 7

Datapipe connections of OSA90/hope with Sorrentino's mode-matching electromagnetic field simulators with adjoint sensitivities (1995)

Datapipe connection of OSA90/hope with Arndt's waveguide component library (1995)

parameterization of arbitrary geometrical structures (1996)

fully-automated Space Mapping optimization of 3D structures (1996)

OSA's Empipe3D connection of OSA90/hope with Hewlett-Packard's HFSS and Ansoft's Maxwell Eminence full-wave 3D simulators (1996)

OSA creates EmpipeExpress and empath for connection to Sonnet Software's *em* field simulator (1996)

Space Mapping optimization with finite element (FEM) and mode matching (MM) EM simulators (1997)

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Milestones 8

Hewlett-Packard acquires OSA, expanding HP's CAE portfolio (1997)

Bandler founds Bandler Corporation (1997)

Trust Region Aggressive Space Mapping (TRASM) for EM design (1998)

Empipe3D integration with HP HFSS by HP EEsof (1998)

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