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EDUCATION

- Ph.D., 1990** Electrical and Computer Engineering
University of California at Santa Barbara
Dissertation: *Analysis of a Tapered Stripline Element in an Infinite Array Environment*
Advisor: Professor George Matthaei
- M.S., 1981** Electrical Engineering
University of Illinois, Urbana, Illinois
Thesis: *A Study of Microstrip Elements and Arrays*
Advisor: Professor Y. T. Lo
- B.S., 1979** Electrical Engineering (Honors)
University of Illinois, Urbana, Illinois

EXPERIENCE

- | | Space Systems/Loral | Palo Alto, CA |
|-----------------------|--|----------------------|
| 7/2006–present | Technical Consultant, Antenna Subsystems Operations.
Continue to provide guidance in antenna/electromagnetic issues. Lead IR&D development efforts in feed design. Developed novel, rapid method for feed horn synthesis via secondary pattern optimization (patent pending). Designed numerous reflector feeds and direct radiating antennas for S, C, K, Ku, and Ka-bands. These included cupped microstrip feed elements, waveguide slot arrays, high efficiency smoothwall and stepped profile horns, and corrugated, profiled horns. Developed high-accuracy synthesis technique for SS/L proprietary lens-fed waveguide slot arrays, used on many commercial programs. Developed proprietary synthesis techniques for high-efficiency horns that reduce synthesis time by an order of magnitude compared to state-of-the-art, commercial horn design software such as CHAMP and Microwave Wizard. | |
| 10/1997–6/2006 | Principal Engineer, Antenna RF Design.
Experienced electromagnetic designer/analyst, scientific programmer with expert-level proficiency in Fortran 95, Fortran 77, Matlab, and L ^A T _E X. Experience also includes programming in APL, C, C++. Responsibilities include design of frequency selective surfaces, meanderline polarizers, various waveguide components. Proficient with commercial analysis tools such as TICRA's GRASP, SWEP, CHAMP, etc; Ansoft HFSS, Zeland IE3D, Mician Wizard. Led IR&D programs to develop and employ custom fullwave analysis programs for designing frequency/polarization selective surfaces, Rotman lenses, array excitation optimization. Developed many other programs for processing/analyzing antenna pattern data. Consult and troubleshoot on various antenna/electromagnetic issues. | |
| 1/1996–10/97 | Senior Technical Specialist, Advanced Antennas.
Responsibilities included design of phased arrays (AITP and Skybridge) and complex shaped | |

reflector antennas (PAS-7) for earth coverage from geosynchronous satellites, and for developing CAD software to enable antenna department design engineers to efficiently perform their duties. Developed entirely new suite of software in Matlab for analyzing and plotting performance contours for antennas mounted on geosynchronous satellites. The software features a full graphic user interface (GUI) and also the ability to run strictly in batch mode for large production runs. Received employee achievement award for significantly increasing antenna design efficiency.

Monitored Professor Rahmat-Samii's research contract with SS/L.

Selected to lead the IRDP efforts in 1998 on stratified media analysis and satellite array technology.

Raytheon Electromagnetic Systems Division

Goleta, CA

1991–1995

Group Leader, Electromagnetic Analysis.

Responsible for planning, formulating, and carrying out numerical analysis of complex antenna and electromagnetic problems. Led a team of highly skilled numerical analysts in the development of large-scale scientific analysis programs to be used as computer-aided design (CAD) tools by antenna/microwave development engineers. Responsible for cost and schedule performance of multiyear CAD projects. Analytical techniques I have employed include integral equation formulations, Finite Difference Time Domain, Mode Matching, Periodic Moment Method, etc. Familiar with software development on PC's, Macintoshes, Sun SPARCstations, and Cray supercomputers. Some experience with transputer-based parallel machines. Experience included C++ development of numerical algorithms for radome analysis and antenna measured data reduction.

Project engineer for Isolation Enhancement Independent Research Project (IRP), dealing with analysis and development of custom-tailored paint-on absorbers. Analysis techniques employed included integral equation and finite difference time domain techniques. Raytheon company lead engineer for analysis of infinite and finite arrays of stripline-fed, dual-polarized, tapered notch arrays. Assistant system administrator for network of three Unix workstations. Wrote system utilities, added users, installed and maintained major C application programs such as T_EX, BRL-CAD, and GNU Emacs. Promoted to Principal Engineer 7/1/93.

1987–1991

Senior Development Engineer, Design and Development.

Formulated various radiation scattering and antenna problems using method of moments. Wrote a design program which calculated the scattering parameters for a unit cell consisting of tapered transition from stripline to semi-infinite parallel plate region. Use of this program in designing Rotman lenses reduced amplitude and phase errors to record low levels. Developed new mathematical algorithms using crystallographic techniques for rapid numerical evaluation of periodic boundary condition Green's functions expressed as doubly infinite series. Used these in analyzing stripline-fed slot of arbitrary geometry employing triangle basis functions in an integral equation-based formulation. Extended this approach to produce the world's first rigorous analysis of a stripline-fed tapered notch array. Wrote a MacIntosh application in MacFortran to perform analysis of radar jammers. Graphical user interface included dialog boxes, x - y plots, alerts, radio buttons, check boxes, etc.

1984–1986

Senior Engineer, Design and Development.

Performed computer simulation of complex ECM microwave systems using S-parameter matrix methods. Designed polarization twister for SLQ-32 EHF advanced transmitter. Wrote program for equivalent circuit analysis of Frequency Selective Surfaces. Performed ray tracing computer analysis of lens/radome combination using array-oriented computer language APL. Performed various antenna system analyses using custom coded solutions on IBM mainframe under CMS, Vax minicomputer under VMS, and IBM PC under MS-DOS.

- Pacific Missile Test Center** **Point Mugu, CA**
- 1980–1983** Antenna Design Engineer.
Designed SM-II shroud antenna coupler. Performed system definition and design for PMTC’s first telemetry phased array. Individual components designed included an 8-way stripline Chebyshev weighted power divider and an array of circular microstrip antennas. Wrote computer program for analyzing arbitrarily shaped microstrip by the boundary integral technique. Designed and prepared circuit artwork on computer aided design system.
- University of Illinois Electromagnetics Lab** **Urbana, IL**
- 1979** Research Assistant.
Studied microstrip antenna elements and arrays. Experimented with novel methods of producing circular polarization from microstrip antennas with single feeds. Learned numerical analysis techniques on mainframe computers in FORTRAN and C.
- 1978–1979** Undergraduate Technician.
Performed experiments with microstrip antennas. Learned use of microwave test equipment such as network analyzer, antenna pattern range, etc.

HONORS AND AWARDS

- 2002** Co-winner of the *SIAM 100-Digit Challenge*, an international numerical computing contest co-sponsored by SIAM and Oxford University. We were the only purely industrial team to win. See <http://www.siam.org/pdf/news/388.pdf> for the original announcement and statement of the problems and <http://www.siam.org/pdf/news/450.pdf> for a list of winners and solutions.
- 1997** Employee Achievement Award, Space Systems/Loral. Two thousand dollar cash award for “significant contributions for improving antenna design efficiency.”
- 1989** Member $\Sigma\Xi$ (Sigma Xi) Scientific research honorary society.
- 1979** Awarded B.S.E.E. *Cum Laude*.
- 1977** Member EKN (Eta Kappa Nu) Electrical Engineering honorary society.
- 1976** Honor Graduate, Naval Science Institute.

PUBLICATIONS/PRESENTATIONS

- P. S. Simon, “RF feed element design optimization using secondary pattern,” U.S. Patent Application Publication US 2013/0006585 A1, Jan 3, 2013.
- P. S. Simon, P. Kung, B. W. Hollenstein, “Electrically large spline profile smooth-wall horns for spot beam applications,” *Antennas and Propagation Society Internat. Symp.*, 2011 IEEE, pp. 915–918. 30 Aug 2011.
- J.-F. Ma, P. Simon, M. Aliamus, M. Thorburn, K. Clausing, “Study of the interaction between the feed and the subreflector and its impact on antenna performance,” paper AIAA-2010-8822. 28th Internat. Comm. Satellite Sys. Conf., 30 Aug – 2 Sept 2010, Anaheim, CA.
- M. J. Maybell, K. K. Chan, and P. S. Simon, “Rotman lens recent developments 1994–2005,” *Antennas and Propagation Society Internat. Symp.*, 2005 IEEE, vol. 2B, pp. 27–30, 3–8 July 2005.
- P. S. Simon, “Analysis and Synthesis of Rotman Lenses,” paper AIAA 2004-3196, 22nd AIAA Internat. Comm. Satellite Sys. Conf., 9–12 May 2004, Monterey, CA.
- P. S. Simon, “Tools for synthesis and analysis of Rotman lenses,” Presentation at IEEE MTT-S Buena Ventura chapter meeting, Camarillo, CA, 17 September 2003.

- P. S. Simon, "Modified RWG basis functions for analysis of periodic structures," *IEEE MTT-S International Symposium Digest*, Seattle, WA, June 2–7, 2002, pp. 2029–2032.
- P. S. Simon, "Efficient Green's function formulation for analysis of frequency selective surfaces in stratified media," *IEEE AP-S International Symposium Digest*, Vol. 4, Boston, MA, July 8–13, 2001, pp. 374–377.
- P. S. Simon, C. S. Kenney, K. McInturff, R. W. Jobsky, and T. A. Bryan, "A modified iterative refinement algorithm for efficient solution of parameter-dependent sets of linear equations," *IEEE AP-S International Symposium Digest*, Vol. 3, Atlanta, GA, June 1998, pp. 1510–1513.
- P. Simon, "Computational Electromagnetics at Raytheon Electromagnetic Systems Division," April 15, 1993, presented at the Santa Barbara section of the IEEE (Institute for Electrical and Electronic Engineers).
- K. McInturff and P. S. Simon, "Closed-form expressions for coefficients used in FD-TD high-order boundary conditions," *IEEE Microwave and Guided Wave Letters*, Vol. 3, no. 7, pp. 222–223, July 1993.
- M. Maybell and P. S. Simon, "Pyramidal horn gain calculation with improved accuracy," *IEEE Trans. Antennas Propagat.*, Vol. 41, no. 7, pp. 884–889, July 1993.
- P. S. Simon, K. McInturff, R. W. Jobsky, and K. C. Smith, "Efficient analysis of periodic structures using a wide-band formulation of the Helmholtz Green's function," *1992 IEEE AP-S International Symposium Digest*, Vol. 1, Chicago, IL, July 18–25, pp. 192–195.
- K. McInturff and P. S. Simon, "The Fourier transform of linearly varying functions with polygonal support," *IEEE Trans. Antennas Propagat.*, Vol. 39, no. 9, pp. 1441–1443, September 1991.
- P. S. Simon and K. McInturff, "Analysis of a tapered stripline element in an infinite array environment," *1991 North American Radio Science Mtg. Program*, London, Ontario, Canada, June 24–28, p. 186.
- P. S. Simon, K. McInturff, R. W. Jobsky, and D. L. Johnson, "Full-wave analysis of an infinite, planar array of linearly polarized, stripline-fed, tapered notch elements," *1991 IEEE AP-S International Symposium Digest*, Vol. 1, London, Ontario, Canada, June 24–28, pp. 334–337.
- D. L. Johnson, P. S. Simon, and K. McInturff, "Moment method analysis of an array of stripline-fed slot elements," *Proc. Progress in Electromagnetics Symposium*, Cambridge, MA, July 1–5, 1991, p. 782.
- P. S. Simon, K. McInturff, D. L. Johnson, and J. A. Troychak, "Moment method analysis of a stripline-fed finite slot using subdomain basis functions," in *Proc. 1989 Ant. Appl. Symp.*, sponsored by Electromagnetic Sciences Division, Rome Air Development Center, USAF Systems Command and Electromag. Lab., Univ. Illinois, Monticello, IL, September 20–22, 1989.
- J. A. Troychak and P. S. Simon, "Impedance-matched coaxial-probe feed for a Rotman lens-fed array with 4.5:1 bandwidth and sector pattern coverage," in *Proc. 1989 Ant. Appl. Symp.*, sponsored by Electromagnetic Sciences Division, Rome Air Development Center, USAF Systems Command and Electromag. Lab., Univ. Illinois, Monticello, IL, September 20–22, 1989.
- W. F. Richards, K. McInturff, and P. S. Simon, "An efficient technique for computing the potential Green's functions for a thin, periodically excited parallel-plate waveguide bounded by electric and magnetic walls," *IEEE Trans. Microwave Theory Tech.*, vol. MTT-35, no. 3, pp.276–281, March 1987.
- P. S. Simon, "Prototype Phased Array Telemetry Tracking Antenna," in *Proc. Internat. Telemet. Conf.*, San Diego, CA, October 24–27, 1983.
- W. F. Richards, Y. T. Lo, P. Simon, and D. D. Harrison, "Theory and applications for microstrip antennas," in *Proc. Workshop on Printed Circ. Antenna Tech.*, sponsored by US Army Research Office and Physical Science Laboratory, New Mexico State University, Las Cruces, NM, October 17–19, 1979.