Leonard W. Schaper Jr.
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PROFESSIONAL EXPERIENCE:

2012 to present   *Schaper Consulting, Inc. (Naples, FL)*

  President

  - Leonard Schaper, consulting in electronic packaging.
  - Louise Schaper, consulting in library design and operations.

2003 to 2006   *Xanodics, LLC (Fayetteville, AR)*

  Founder and CEO

  - With Prof. Rick Ulrich, initiated start-up company to commercialize UA-developed thin film capacitor technology.
  - Had several successful contracts to supply prototype components.
  - Dissolved company when customer program needs changed.

1992 to present   *University of Arkansas (Fayetteville, AR)*

  Professor Emeritus of Electrical Engineering (2009 to present)

  Professor of Electrical Engineering (2002 to 2008)

  - Directed research program in through-silicon vias for 3-D VLSI packaging.
  - Developed fabrication methods for multilayer thin film capacitors.
  - Taught undergraduate courses in electronics and graduate courses in electronic packaging.
  - Fall, 2005 semester, sabbatical assignments: 6 weeks at the Fraunhofer Institute IZM in Berlin and Munich; 4 weeks at NEC in Sagamihara, Japan.

  Director, High Density Electronics Center and Professor, Electrical Engineering (1992 to 2002)

- Directed large ($3M annual) research program in Multichip Module technology. Led efforts of 15 faculty, 4 - 6 post-docs, 8 staff, and 25 graduate students. Ran a 4000 square foot clean room dedicated to MCM research.
- Developed the interconnected mesh power system topology for MCM cost reduction.
- Developed new, low inductance, thin-film decoupling capacitors.
- Led development of integral passive components on polyimide film.
- Formulated national policy on advanced packaging R&D working through the EIA MCM division and consulting for DARPA.
- Led efforts resulting in the successful merger of IEPS and ISHM to form IMAPS.

1990 to 1992 *Alcoa Electronic Packaging (San Diego, CA)*

Director, Thin Film Product Programs (1991 to 1992)

- Directed product and market development for thin film multichip modules. Oversaw applications engineering, product engineering, and design effort on various implementations of MCM technology. Consulted extensively with customers on the tradeoffs affecting their MCM designs. Was corporate spokesman at many conferences, workshops, and industry seminars on MCMs. Successfully led prototype development for several satisfied customers. Represented Alcoa on the industry-wide team seeking enlarged Federal support of MCM technology.

Director, Thin Film Technology Development (1990 to 1991)

- Led technology development for thin film multichip modules. Transferred the AT&T MCM technology licensed to Alcoa. Led a team of materials scientists and engineers in correcting reliability problems. Refined the modeling approaches for MCM power distribution.

1978 to 1990 *AT&T BELL LABORATORIES (Murray Hill, New Jersey)*

Head, Technical Program Analysis Department (1986 to 1990)

- Managed the department responsible for the coherence of the Bell Laboratories technical program. Reviewed project expenses and program content, and projected future needs.
- Served as chief technologist for the AT&T 21st Century Project, a year long effort to define future scenarios for AT&T. Gained extensive

experience in scenario analysis methods. Produced a robust plan for technology development.

- Created numerous presentations for international audiences for the president of AT&T Bell Laboratories. Developed and researched presentation themes, assembled material, produced professional graphics, and had overall responsibility for technical content on a wide range of telecommunications and technology issues.
- Produced an annual report on AT&T R&D. Coordinated the inputs of a score of diverse authors into a coherent document used by top-level AT&T executives to plan R&D programs. Created a management tracking system for the several hundred individual R&D projects throughout the AT&T R&D community.

Supervisor, Electronics Technology Planning Center (1981 to 1986)

- Co-invented the copper-polyimide on silicon multichip module packaging concept known as Advanced VLSI Packaging (AVP). Developed and patented AVP power distribution using an integrated decoupling capacitor. Successfully lobbied area management to turn a "skunkworks" effort into a fully funded R&D program.
- Developed fundamental concepts of the economics of interconnection to show that system cost can be minimized by reducing the length of interconnection wire.
- Created econometric models for integrated circuit pricing as a function of technology development and production capacity.
- Supervised work on integrated circuit yield modeling which led to more cost-effective utilization of IC production facilities.

MTS, Electronics Technology Planning Center (1980 to 1981)

- Developed a product line planning tool to relate product volume and development expense as a function of technological maturity.
- Designed and patented a chip package with power distribution optimized for low noise.

MTS, Electronic Power Systems Laboratory (1978 to 1980)

- Designed and built the first 500 KHz power converter using MOSFET technology.
- Analyzed the noise propagation characteristics of various planar power distribution systems.
- Developed a UNIX-based automated test system for production testing of electronic power converters.

1968 to 1978   *New Jersey Institute of Technology (Newark, New Jersey)*

Assistant Professor, Civil Engineering Department (1973 to 1978)

- Developed and taught courses in transportation, urban systems analysis, and numerical methods.
- Researched the demographics and economics of urban environments using the simulation modeling techniques of systems dynamics.
- Helped establish a new degree program, Man and Technology, as a general undergraduate program in humanistic studies and technological literacy.

Instructor in NSF Summer Program for minority high school students (1971 to 1973)

- Taught a course in urban planning to a mix of inner city and suburban students which promoted teamwork and allowed them to discover their similarities.

Instructor in Electrical Engineering (1968 to 1971)

- Introduced elective courses in antenna theory and radio astronomy.
- Established an antenna measurements laboratory with donated equipment.

EDUCATION: Dr. Engr. Sc., New Jersey Institute of Technology, 1973
    Urban Mass Transportation Fellowship
SMEE, Massachusetts Institute of Technology, 1968
    National Defense Education Act Title IV Fellowship
BSEE, Newark College of Engineering, 1967
    Summa cum Laude
    National Merit Scholarship
    Member, Tau Beta Pi, Eta Kappa Nu, and Omicron Delta Kappa Honor Societies

PROFESSIONAL ACTIVITIES:

- Fellow, Institute of Electrical and Electronic Engineers (IEEE)
- Fellow and Life Member, International Microelectronics and Packaging Society (IMAPS)
- IEEE Computer Society technical committee on packaging, 1982 - 1994
- Board of Directors, International Electronics Packaging Society, 1990 - 1996

- President, International Electronics Packaging Society, 1995 - 1996
- Continuing education chair, IMAPS, 1997 - 1998
- Vice President of Technology, IMAPS, 1999 - 2000
- Program committee and session chair, IEPS conferences, 1983 - 1996
- General co-chair, ISHM MCM Advanced Technology Workshop, 1992
- Program committee and session chair, IEPS/ISHM MCM conference, 1992 - 1996
- Technical co-chair, IMAPS MCM Conference, 1997
- Technical chair, IMAPS MCM Conference, 1998
- Program committee and session chair, IEEE MCM conference, 1992
- Session chair, IEEE Computer Packaging Workshops, 1984 - 1992 (even years)
- Steering committee member and Technology chair, EIA MCM Division, 1992 - 1995
- Associate editor, IEEE Transactions on Advanced Packaging, 1992 - 2000
- General chair, IEEE Computer Packaging Workshop, 1993
- Program committee, IEEE VLSI Packaging Workshop of Japan, 1996 – 2009
- Program committee, IEEE Japan System Packaging Workshop, 1994 – 2009
- Program committee, Electronic Components and Technology Conference, 1994 – 2010
- Chair, IEEE CPMT Technical Committee on Discrete and Integral Components, 2002 – 2005
- Member, IEEE CPMT Board of Governors, 1999 – 2001 and 2007 – 2012
- Chair, IEEE CPMT Field Level CPMT Award committee, 2008 - 2009

AWARDS: IMAPS William D. Ashman Memorial Award, 2002
              IMAPS Executive Council Service Award, 1999
              IEEE CPMT Outstanding Sustained Technical Contributions Award, 1996
              IEEE ECTC Outstanding Paper Award, 1995
              IEPS Symposium Best Paper Award, 1996
              IMAPS MCM Conference Outstanding Paper Award, 1997

PUBLICATIONS: Over 320 journal articles, proceedings papers, and presentations authored or co-authored.

PATENTS: Twenty-one U. S. patents in electronic packaging and optical communications.

CONSULTING: Expert witness in patent matters related to electronic packaging

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