

## TIMOTHY J. DRABIK, PH.D.

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### *SUMMARY*

Over thirty years experience in microelectronics and optics research and development in the U.S. and in Europe. Record of visionary innovation in semiconductor device fabrication, micro-optics, optoelectronic packaging, integrated optoelectronic systems, display technology, and parallel computing architectures, underpinned by command over a wide and interdisciplinary base of skills. Strong record of scholarly publication and worldwide reputation in technology community. Leadership roles in high-profile, U.S.- and E.U.-based, government- and industry-funded, technology program development and implementation. Demonstrated ability in developing new enabling technologies into competitive product applications. Extensive intellectual property development and litigation support experience at the highest levels. Strong, results-oriented management and leadership skills. Areas of expertise include:

- ◆ WDM transmission and switching
  - ◆ Microelectronics fabrication processes
  - ◆ Refractive and diffractive micro-optics
  - ◆ Compound semiconductor devices
  - ◆ Advanced packaging
  - ◆ Classical and quantum optics
  - ◆ Digital and analog VLSI design
  - ◆ Signal processing
  - ◆ Neuromorphic computing
  - ◆ Low-cost, wafer-level manufacturing
  - ◆ Microfluidics structures
  - ◆ Optical telecommunication and switching
  - ◆ Display technologies
  - ◆ Optical storage technologies
  - ◆ Computer and memory architectures
  - ◆ Guided-wave optics technologies
  - ◆ Liquid crystal technology and components
  - ◆ Thermomechanical design
  - ◆ Optoelectronic integration and packaging
  - ◆ Optical high-speed interconnection
  - ◆ Micromachining
  - ◆ Communication and information theory
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### *EMPLOYMENT*

**PAGE MILL TECHNOLOGY CORP., LOS ALTOS, CA**

**SEP. 2001 TO PRESENT**

#### *Founder and CTO*

Technology development: focus on new planar component designs and fabrication technologies for displays, optical telecommunications, and biofluidics. Innovative design and advanced, batch-fabrication techniques enable disruptive improvements in functionality and cost. Consulting: design, problem-solving, reverse-engineering, due-diligence, intellectual property counseling, litigation support, translation of highly technical German-language material.

Current activities relate to improving liquid crystal display contrast and dynamic range, and developing integrated components for optical telecommunications.

**SPECTRALANE, INC., SANTA CLARA, CA**

**OCT. 2001 TO MAY 2002**

***Consultant***

In an early-stage, long-haul optical networking company fielding a new technology, resolved problems with optical system architecture, packaging, and process control; developed optical metrology techniques and design automation tools; conducted early-stage project management.

**DISPLAYTECH, INC., LONGMONT, CO**

**JULY 2000 TO OCT. 2001**

***Director of Telecommunications***

Position reporting to CTO. Responsible for identifying and developing opportunities in optical networking for a microdisplay company founded on liquid-crystal-on-silicon (LCOS) core technology.

Performed surveys of optical networking markets and evaluated trends in that market. Identified attractive long-haul and metro-area opportunities matching the company's technology, engineering expertise and production environment.

Created novel device and component designs exploiting the unique phenomenology of ferroelectric liquid crystals (FLCs). Formulated new, highly integrated embodiments of core transparent optical networking functions amenable to FLC/silicon capabilities.

Designed next-generation transparent optical switches, reconfigurable optical add/drop multiplexors, and polarization control products to effect disruptive cost-reductions through leverage of existing, high-volume manufacturing base and integration of additional low-cost technologies.

Directed consultants working in Stanford Nanofabrication Facility (SNF) on the application of advanced processes for guided-wave device fabrication and silicon micromachining to the exploration of new device configurations.

**STANFORD UNIVERSITY**

**JAN. 1999 TO SEP. 2009**

**DEPARTMENT OF ELECTRICAL ENGINEERING**

***Professor (Consulting) ('06 to '09)***

***Associate Professor (Consulting) ('00 to '06)***

***Associate Professor (Visiting) ('99 to '00)***

Current research relates to the development of disruptively cheap components for polarization control and optical polarization mode dispersion compensation for enhancing signal integrity in optical fiber communication.

In connection with the *MARCO/DARPA Interconnect Focus Center* (IFC), formulated and conducted a nationwide survey of microelectronics industry leaders in order to quantify interconnect problems, identify opportunities for optical interconnection, and formulate system-level requirements for optics in next-generation, high-performance digital systems.

Designed module packaging schemas (passive microoptics and optomechanics) for off-chip and on-chip optical interconnection in high-performance digital systems, to support future system-

level performance requirements projected by the International Technology Roadmap for Semiconductors (ITRS) of the Semiconductor Industry Association.

Directed research activity in end-to-end optical link design, optoelectronic hybridization, and packaging.

Directed a Small Business Technology Transfer Research (STTR) program in wafer-level, additive fabrication technology of fluid channels for liquid-crystal, VLSI-based microdisplays. Developed joint hardware–algorithm codesigns for efficient, artifact-free, full-color, motion video on binary microdisplays.

Directed a DARPA program on *Optically-Interconnected Intelligent RAM Multiprocessors*: global performance modeling, optimal utilization of silicon and optical-interconnect resources, minimization of processor–memory latency.

**GEORGIA TECH LORRAINE**

**JAN. 1995 TO JUNE 1997**

**TECHNOPÔLE METZ, METZ, FRANCE**

***Research Director***

Program development activity at *Georgia Tech Lorraine (GTL)*, the European platform of the Georgia Institute of Technology (GIT) in Metz, France, leading to the creation and launch of the *Centre GTL–CNRS Telecom* at GTL as a joint venture between GIT and the French national research body *Centre National de la Recherche Scientifique (CNRS)*.

The Center pursues research in telecommunications related areas of optics in cooperation with a network of partner laboratories of the Georgia Institute of Technology, the CNRS and other university and industrial entities. Research areas include quantum encryption, diffractive optics, single-photon detection, electromagnetics, advanced laser technology, and nonlinear optics.

Built international research program consortia from among major European academic research institutions and high-technology industry. Program elements included diffractive micro-optics, optoelectronic hybrid integration, advanced packaging, vertical-cavity laser (VCL) technology, and optical interconnection architectures. Formulated program goals to exploit strengths of constituents.

**GEORGIA INSTITUTE OF TECHNOLOGY**

**SEP. 1990 TO JUNE 2000**

**SCHOOL OF ELECTRICAL ENGINEERING AND MICROELECTRONICS RESEARCH CENTER**

***Assistant Professor ('90 to '96)***

***Associate Professor with tenure ('96 to '00)***

*A vertically-oriented program in optoelectronic hybridization and packaging, passive micro-optics, and architectures for optoelectronic integrated systems:*

- ◆ Demonstrated and commercialized the first silicon-VLSI-based ferroelectric liquid crystal (FLC) microdisplays based on DRAM and SRAM active VLSI backplanes.
- ◆ Developed new techniques for device-scale, quasi-monolithic hybridization of high-speed, optoelectronic devices with silicon VLSI.

- ◆ Investigated interconnect capabilities and limitations of free-space optics for digital systems. Created new design automation techniques for optimal joint utilization of wire and optical interconnection resources.
- ◆ Demonstrated optoelectronic neural-analog monolithic arrays implementing vision functions: real-time edge/motion enhancement with optical image output, stereo disparity mapping.
- ◆ Implemented new silicon VLSI driver and photoreceiver backplane designs for 2-D, vertical-cavity, surface-emitting laser (VCSEL) arrays flip-chip bonded in area-array configuration.
- ◆ Developed integrated diffractive–refractive micro-optical array technology for optical interconnect applications.
- ◆ Developed techniques for optimal design of passive optical structures incorporating fabrication process models.
- ◆ Developed ultra-thin, low-thermal-resistance die-attach technology for high-power microelectronics and optoelectronics applications.
- ◆ Applied nonlinear digital signal processing and optimal filtering formalisms to the synthesis of a technique for proximity effect correction in electron-beam nanolithography.

Theses advised:

- ◆ Zhou, Z., “Diffractive Elements for Optical Interconnects,” Ph.D. Thesis, Georgia Institute of Technology, 1993.
- ◆ Hargis, M. C., “Metal-Semiconductor-Metal Photodetectors and their Integration via Epitaxial Liftoff,” Ph.D. Thesis, Georgia Institute of Technology, 1994.
- ◆ Titus, Albert H., “Biologically-Based Stereopsis: Theories and VLSI Implementation,” Ph.D. Thesis, Georgia Institute of Technology, 1997.
- ◆ Hattrisse, Xavier, “New Components for Passive Optical Network and Cable Television,” M.S. Thesis, Georgia Institute of Technology, 1998.
- ◆ Callahan, John J., “Optoelectronic Hybrid Integration Utilizing Au/Sn Bonding,” Ph.D. Thesis, Georgia Institute of Technology, 2000.

Program development and research support:

- ◆ Industrial support from Kodak, Sun Microsystems, IBM, Displaytech.
- ◆ State and Federal support: Georgia Research Alliance, NSF, DARPA, Army Research Laboratory.
- ◆ Principal contributor to successful NSF Engineering Research Center on Packaging.

Distinctions: NSF Research Initiation Award, 1990.

### ***Research Associate ('87 to '90)***

Investigated new architectures for optically interconnected parallel computers. Explored mechanisms for defect-tolerance through optical interconnection. Established bounds on the volume-time complexity of data-parallel algorithms on a large class of optically interconnected architectures.

Developed a technology base for prototyping optoelectronic integrated systems, including the first demonstration of ferroelectric liquid crystal reflective light modulator cells integrated with mainstream silicon VLSI flows.

Distinctions: President's Fellowship.

**UNIVERSITY OF CALIFORNIA, SAN DIEGO**

**APR. 1984 TO AUG. 1987**

**DEPARTMENT OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCE**

***Research Associate***

Conceived and developed the shift-connected SIMD architecture for optically interconnected processor arrays. Developed and performed complexity analysis of algorithms for multidimensional, data-parallel tasks on shift-connected arrays.

Participated in design and fabrication of spatial light modulators in silicon/PLZT and silicon/organic-electro-optical materials systems.

Distinctions: California MICRO Fellowship; IBM Fellowship

**AT&T BELL LABORATORIES**

**JUNE 1981 TO MAR. 1984**

**ADVANCED SWITCHING TECHNOLOGY LABORATORY, NAPERVILLE, IL**

***Member of Technical Staff***

Evaluated new optoelectronic technologies and incorporated them into prototypes for wideband, fiber local access networks.

Investigated application of fine-line nMOS VLSI technology to new wideband multiplexing and switching systems.

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***EARNED DEGREES***

**PH.D. IN ELECTRICAL ENGINEERING**

**1990**

Georgia Institute of Technology, Atlanta, GA

Distinctions: Sigma Xi *Outstanding Ph.D. Thesis* Award

**M.S.E.E. IN OPTICS AND DIGITAL SIGNAL PROCESSING**

**1982**

Georgia Institute of Technology, Atlanta, GA

**B.S. IN ELECTRICAL ENGINEERING AND B.S. MATHEMATICS**

**1981**

Rose-Hulman Institute of Technology, Terre Haute, IN

Distinctions: Certification in technical translation of German to English  
1979–80 academic year at Universität Stuttgart, Germany

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*LITIGATION SUPPORT EXPERIENCE*

Date: 2001–2002

Matter: METHODE ELECTRONICS, INC. and STRATOS LIGHTWAVE, INC., Plaintiffs, v. FINISAR CORPORATION, Defendant. Civil Action No. CV-00-20985-JF/RS, U.S. District Court, Northern District of California, San Jose Division.

Project: *(With Gray, Cary, Ware, and Freidenrich, Palo Alto, CA)*

Retained by Counsel for Defendant. Claim construction, opinion on infringement, deposition, tutorial aids relating to optoelectronic packaging.

Date: 2002–2003

Matter: LEXAR MEDIA, INC., a Delaware corporation, Plaintiff, v. PRETEC ELECTRONICS CORP., a California corporation; PNY TECHNOLOGIES, INC., a Delaware corporation; MEMTEK PRODUCTS, INC., a California corporation; and C-ONE TECHNOLOGY CORPORATION, a Taiwan corporation, Defendants, AND RELATED CROSS ACTIONS. Case No. C-00-4770 MJJ, U.S. District Court, Northern District of California, San Francisco Division.

Project: *(With Kecker & Van Nest, San Francisco, CA)*

Retained by Counsel for Defendants MEMTEK PRODUCTS, INC. and C-ONE TECHNOLOGY CORPORATION. Validity opinions relating to flash memory technology.

Date: 2003

Matter: YASUO KAMATANI, and LASER DYNAMICS, INC., Plaintiffs, v. LITE-ON (USA) INTERNATIONAL INC., LITE-ON IT CORP. and JVC LITE-ON IT MANUFACTURING AND SALES, LIMITED, Defendants. Civil Action No. H-01-4123, U.S. District Court, Southern District of Texas, Houston Division.

Project: *(With Thomas, Kayden, Horstemeyer & Risley, Atlanta, GA)*

Retained by counsel for Defendants. Validity and infringement opinions relating to optical storage (DVD) technology.

Date: 2003

Matter: GENESIS MICROCHIP INC. (Delaware), Complainant, v. MEDIA REALITY TECHNOLOGIES, INC. (Taiwan and California), TRUMPTION MICROELECTRONICS, INC. (Taiwan), and MSTAR SEMICONDUCTOR, INC. (Taiwan), Respondents. In the Matter of CERTAIN DISPLAY CONTROLLERS AND PRODUCTS CONTAINING SAME, United States International Trade Commission, Investigation No. 337-TA-491.

Project: *(With Fish & Richardson, Washington, DC)*  
Retained by Counsel for Complainant Genesis. Testifying expert on International Trade Commission matter. Claim construction, infringement opinions, validity opinions relating to display controller technology, technology tutorial presented to the Court and Commission.

Date: 2004

Matter: METHODE ELECTRONIC, INC., and STRATOS LIGHTWAVE, INC., Plaintiffs, v. INFINEON TECHNOLOGIES NORTH AMERICA CORP., Defendant. Consolidated Civil Action Nos. C 01-02755 JW (RS), C 99-21142 JW (RS), U.S. District Court, Northern District of California, San Jose Division.

Project: *(With Reed Smith, San Francisco, CA)*  
Retained by Counsel for Infineon. Infringement opinions relating to optical transmitter/receiver technology.

Date: 2004

Matter: MEDIATEK INC. (Taiwan), Complainant, v. ZORAN CORPORATION, INC. (California), OAK TECHNOLOGY, INC. (California), and SUNEXT TECHNOLOGY CO., LTD (Taiwan), Respondents. In the Matter of CERTAIN OPTICAL DISK CONTROLLER CHIPS AND CHIPSETS AND PRODUCTS CONTAINING THE SAME, INCLUDING DVD PLAYERS AND PC OPTICAL STORAGE DEVICES II, United States International Trade Commission, Investigation No. 337-TA-523.

Project: *(With Weil, Gotshal & Manges, Washington, DC)*  
Retained by Counsel for Complainant Mediatek. Expert on International Trade Commission matter.

Date: 2004

Matter: RENESAS TECHNOLOGY CORP., Plaintiff, v. NANYA TECHNOLOGY CORP. and NANYA TECHNOLOGY CORPORATION, USA, Defendants. NANYA TECHNOLOGY CORP. and NANYA TECHNOLOGY CORPORATION, USA, Counterclaim Plaintiffs, v. RENESAS TECHNOLOGY CORP., Counterclaim Defendant. Case No. C 03 05709 JF, U. S. District Court, Northern District of California, San Jose Division.

Project: *(With Jenner & Block, Chicago, IL)*  
Retained by Counsel for Renesas Technology Corp. Testifying expert on matter relating to DRAM technology.

Date: 2004

Matter: IP INNOVATION L.L.C. and TECHNOLOGY LICENSING CORPORATION, Plaintiffs, v. DELL COMPUTER CORPORATION, Defendant. Case No. 03 C 3245, U. S. District Court, Northern District of Illinois, Eastern Division.

Project: *(With Wilson, Sonsini, Goodrich & Rosati, Palo Alto, CA)*  
Retained by Counsel for Dell Computer Corp. Testifying expert on matter relating to video processing and display technology.

Date: 2005

Matter: IP INNOVATION L.L.C. and TECHNOLOGY LICENSING CORPORATION, Plaintiffs, v. PANASONIC CORPORATION OF NORTH AMERICA and MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD., Defendants. Case No. 05 C 0902, U. S. District Court, Northern District of Illinois, Eastern Division.

Project: *(With Amster, Rothstein & Ebenstein, NY, NY)*  
Retained by Counsel for Matsushita. Testifying expert on matter relating to video processing and display technology.

Date: 2005

Matter: YASUO KAMATANI, and LASER DYNAMICS, INC., Plaintiffs, v. BENQ CORPORATION and BENQ AMERICA CORP., Defendants. Civil Action No. 203-CV-00437, U.S. District Court, Eastern District of Texas, Marshall Division.

Project: *(With Wilson, Sonsini, Goodrich & Rosati, Austin, TX)*  
Retained by Counsel for BenQ. Testifying expert on matter relating to optical disk technology.

Date: 2007–2009

Matter: RICOH COMPANY, LTD., Plaintiff, v. ASUSTEK COMPUTER, INC, QUANTA COMPUTER, INC, *et al.*, Defendants. Civil Action No. 06C0462C, U.S. District Court, Western District of Wisconsin.

Project: *(With Paul Hastings Janofsky & Walker, LLP, Palo Alto, CA and Los Angeles, CA)*  
Retained by Counsel for defendants ASUS and Quanta. Testifying expert on matter relating to optical disk drive technology.

Date: 2007–2009

Matter: LG ELECTRONICS, INC., Plaintiff, v. BIZCOM ELECTRONICS, INC, *et al.*, Defendants. Case No.: C-01-v-01375 CW; C-01-1552-CW; C-01-1594-CW; C-01-2187-CW/USCA #s 05-1261; 05-1262; 05-1263; 05-1264; 05-1302; 05-1303; 05-1304; NDCA.

Project: *(With Fish & Richardson, Washington, DC)*  
Retained by Counsel for Plaintiff LG Electronics. Testifying expert on matter relating to automotive video technology.

Date: 2007–2009

Matter: HONEYWELL INTERNATIONAL, INC., and HONEYWELL INTELLECTUAL PROPERTIES, INC., Plaintiffs, v. ACER AMERICA CORPORATION *et al.*, Defendants. Civil Action No. 6:07CV125, U.S. District Court, Eastern District of Texas.

Project: *(With Robins, Kaplan, Miller & Ciresi L.L.P., Atlanta, GA)*

Retained by Counsel for plaintiffs Honeywell International, Inc. and Honeywell Intellectual Properties, Inc. Testifying expert on matter relating to liquid crystal display technology.

Date: 2007–2008

Matter: FUNAI ELECTRIC CO., LTD. (Daito City, Osaka, Japan), and FUNAI CORPORATION, INC. (Rutherford, NJ), Complainants, v. VIZIO, INC. (Irvine, CA), AMTRAN TECHNOLOGY CO., LTD. (Taipei Hsien, Taiwan), POLAROID CORPORATION (Waltham, MA), PETERS GROUP WORLDWIDE, LLC (Minnetonka, MN), SYNTAX-BRILLIAN CORPORATION (Tempe, AZ), TAIWAN KOLIN CO., LTD. (Taipei City, Taiwan), PROVIEW INTERNATIONAL HOLDINGS, LTD. (Kuntong, Hong Kong), PROVIEW TECHNOLOGY (SHENZHEN) CO., LTD. (Shen Zhen, China), PROVIEW TECHNOLOGY, INC. (Garden Grove, CA), TPV TECHNOLOGY, LTD. (Wanchai, Hong Kong), TPV INTERNATIONAL (USA), INC. (Austin, TX), TOP VICTORY ELECTRONICS (TAIWAN) CO., LTD. (Taipei Hsien, Taiwan), and ENVISION PERIPHERALS, INC. (Fremont, CA), Respondents. In the Matter of CERTAIN DIGITAL TELEVISION PRODUCTS AND CERTAIN PRODUCTS CONTAINING SAME AND METHODS OF USING SAME, United States International Trade Commission, Investigation No. 337-TA-617.

Project: *(With O'Melveny & Myers LLP, Pauley Petersen & Erickson, Chicago, IL, Ropes & Gray LLP, and Sidley Austin Brown & Wood LLP)*

Retained by Joint Defense Group for Respondents. Testifying expert on matter relating to signal processing technology for television. Testimony on claim construction and validity.

Date: 2009–2010

Matter: IP INNOVATION LLC, and TECHNOLOGY LICENSING CORPORATION, Plaintiffs, v. VIZIO, INC. (f/k/a V, Inc.) and MICROSOFT CORPORATION, Defendants, Civil Action No. 08 C 393, U.S. District Court, Eastern District of Illinois.

Project: *(With Zarian Midgley & Johnson, PLLC)*

Retained by counsel for Defendant Vizio. Testifying expert on matter relating to video processing and display technology. Opinions on validity and infringement.

Date: 2009–2010

Matter: SEMICONDUCTOR ENERGY LABORATORY CO., LTD., Plaintiff, v. SAMSUNG ELECTRONICS CO., LTD., S-LCD CORPORATION, SAMSUNG ELECTRONICS AMERICA, INC., SAMSUNG TELECOMMUNICATIONS AMERICA, LLC, AND SAMSUNG MOBILE DISPLAY CO., LTD., Defendants, Civil Action No. 3:09-CV-00001, U.S. District Court, Western District of Wisconsin.

Project: *(With O'Melveny & Myers LLP)*

Retained by counsel for Defendants. Testifying expert on matter relating to liquid crystal display design and manufacturing technology. Opinions on validity and infringement.

Date: 2010

Matter: SONY CORPORATION, Complainant, v. TPV TECHNOLOGY LIMITED (Hong Kong), TOP VICTORY ELECTRONICS CO., LTD. (Taiwan), ENVISION PERIPHERALS, INC. (Fremont, CA), TOP VICTORY INVESTMENTS LTD. (Hong Kong), TPV ELECTRONICS CO., LTD. (Fujian), TPV DISPLAY TECHNOLOGY CO., LTD. (Wuhan), TPV TECHNOLOGY CO., LTD. (Beijing), CHIMEI INNOLUX CORPORATION (Taiwan), INNOLUX CORPORATION (Austin, TX), and VIEWSONIC CORPORATION (Walnut, CA), Respondents. In the Matter of CERTAIN DISPLAY DEVICES, INCLUDING DIGITAL TELEVISIONS AND MONITORS, United States International Trade Commission, Investigation No. 337-TA-713.

Project: *(With Sidley Austin Brown & Wood LLP)*

Retained by counsel for Respondents Chimei Innolux Corporation and Innolux Corporation. Testifying expert on matter relating to digital televisions and monitors.

Date: 2010–2011

Matter: THOMSON LICENSING SAS (France) and THOMSON LICENSING LLC (Princeton, NJ), Complainants, v. CHIMEI INNOLUX CORPORATION (Taiwan), CHI MEI OPTOELECTRONICS USA, INNOLUX CORPORATION (Austin, TX), REALTEK SEMICONDUCTOR CORPORATION (Taiwan), MSTAR SEMICONDUCTOR, INC. (Taiwan), AU OPTRONICS CORPORATION (Taiwan), AU OPTRONICS CORPORATION AMERICA (Houston, TX), BENQ AMERICA CORPORATION (Irvine, CA), BENQ CORPORATION (Taiwan), BENQ LATIN AMERICA CORPORATION (Miami, FL), QISDA AMERICA CORPORATION (Irvine, CA), QISDA CORPORATION (Taiwan), AND QISDA (SUZHOU) CO., LTD. (China), Respondents. In the Matter of CERTAIN LIQUID CRYSTAL DISPLAY DEVICES, INCLUDING MONITORS, TELEVISIONS, AND MODULES, AND COMPONENTS THEREOF, United States International Trade Commission, Investigation No. 337-TA-749C.

Project: *(With Wolf Greenfield & Sacks, P. C., Boston, MA)*  
Retained by counsel for Respondent MStar Semiconductor, Inc. Testifying expert on matter relating to liquid crystal display monitors and controllers.

Date: 2010–2012

Matter: MOTOROLA MOBILITY, INC. (Libertyville, IL) and GENERAL INSTRUMENTS CORPORATION (Horsham, PA), Complainants, v. MICROSOFT CORPORATION (Redmond, WA), Respondent. In the Matter of CERTAIN GAMING AND ENTERTAINMENT CONSOLES, RELATED SOFTWARE, AND COMPONENTS THEREOF, United States International Trade Commission, Investigation No. 337-TA-752.

Project: *(With Ropes & Gray, LLP)*  
Retained by counsel for Complainant Motorola. Testifying expert on matter relating to video coding hardware and software.

Date: 2010–2012

Matter: MICROSOFT CORPORTATION, Plaintiff, v. MOTOROLA, INC., and MOTOROLA MOBILITY, INC., and GENERAL INSTRUMENT CORPORATION, Defendants; MOTOROLA MOBILITY, INC., and GENERAL INSTRUMENT CORPORATION, Plaintiffs/Counterclaim Defendant, v. MICROSOFT CORPORATION, Defendant/Counterclaim Plaintiff, Case No. C10-1823-JLR, U.S. District Court, Western District of Washington at Seattle.

Project: *(With Ropes & Gray, LLP)*  
Retained by counsel for Defendant/Plaintiff/Counterclaim Defendant Motorola. Testifying expert on matter relating to video coding hardware and software.

Date: 2011–2013

Matter: POSITIVE TECHNOLOGIES, INC., Plaintiff, v. SONY ELECTRONICS, INC., ACER AMERICA CORPORATION, GATEWAY, INC., DELL, INC., ASUS COMPUTER INTERNATIONAL, LENOVO (UNITED STATES) INC., MSI COMPUTER CORPORATION, AMAZON.COM, INC., BARNES & NOBLE, INC., AND KOBO INC., Defendants, Case No. 11-CV-2226 SI, U.S. District Court, Northern District of California, San Francisco Division.

Project: *(With Klarquist Sparkman, LLP, et al.)*  
Retained by counsel for Defendants. Testifying expert on matter relating to electrophoretic and liquid-crystal displays.

Date: 2011–2012

Matter: S3 GRAPHICS CO. LTD., and S3 GRAPHICS INC., Complainants, v. APPLE INC. a/k/a APPLE COMPUTER, INC., Respondent. In the Matter of CERTAIN ELECTRONIC DEVICES WITH GRAPHCS DATA PROCESSING SYSTEMS,

COMPONENTS THEREOF, AND ASSOCIATED SOFTWARE, United States International Trade Commission, Investigation No. 337-TA-813.

Project: *(With O'Melveny & Myers, LLP)*

Retained by counsel for Respondent. Testifying expert on matter relating to video graphics controllers.

Date: 2012–2014

Matter: GRAPHICS PROPERTIES HOLDINGS, INC. (New Rochelle, NY), Complainant, v. RESEARCH IN MOTION LTD. (Canada), RESEARCH IN MOTION CORP. (Irving, TX), HTC CORPORATION (Taiwan), HTC AMERICA, INC. (Bellevue, WA), LG ELECTRONICS, INC. (Korea), LG ELECTRONICS (Englewood Cliffs, NJ), LG ELECTRONICS MOBILECOMM U.S.A. (San Diego, CA), APPLE INC. (Cupertino, CA), SAMSUNG ELECTRONICS CO., LTD. (Korea), SAMSUNG ELECTRONICS CO. LTD. (Korea), SAMSUNG TELECOMMUNICATIONS (Richardson, TX), SONY CORPORATION OF AMERICA (New York, NY), SONY ELECTRONICS, INC. (San Diego, CA), SONY ERICSSON MOBILE (Sweden), SONY ERICSSON MOBILE (Atlanta), Respondents. CERTAIN CONSUMER ELECTRONICS AND DISPLAY DEVICES AND PRODUCTS CONTAINING SAME, United States International Trade Commission, Investigation No. 337-TA-836.

Project: *(With Wolf Greenfield & Sacks, P. C., Boston, MA, and Covington & Burling LLP, Washington, DC)*

Retained by Counsel for Respondents Sony and Samsung. Testifying expert on matter relating to liquid crystal display technology.

Date: 2012–2014

Matter: INTELLECTUAL VENTURES I LLC and INTELLECTUAL VENTURES II LLC, Plaintiffs, v. MOTOROLA MOBILITY LLC, Defendant, Case No. 11-CV-00908-SLR, U.S. District Court, District of Delaware.

Project: *(With Kilpatrick Townsend & Stockton LLP, Atlanta, GA)*

Retained by Counsel for Defendant Motorola. Testifying expert on matter relating to liquid crystal display technology and consumer electronics.

Date: 2014

Matter: JDS UNIPHASE CORPORATION, Petitioner, v. FIBER, LLC, Patent Owner, Case Nos. IPR2013-00318 and IPR2013-00336, U.S. Patent Trial And Appeal Board.

Project: *(With K&L Gates LLP, Washington, D.C.)*

Retained by Counsel for Petitioner JDS Uniphase. Inter-partes reviews relating to optical switching technology.

Date: 2014  
Matter: FUJITSU NETWORK COMMUNICATIONS, INC., Petitioner, v. THOMAS SWAN & CO. LTD., Patent Owner, Inter Partes Reviews (Case Nos. unassigned), U.S. Patent Trial And Appeal Board.  
Project: *(With Milbank Tweed, New York, N.Y.)*  
Retained by Counsel for Petitioner Fujitsu Network Communications. Inter-partes reviews relating to optical switching technology.

Date: 2014  
Matter: SEOUL SEMICONDUCTOR CO., LTD and NORTH AMERICA SEOUL SEMICONDUCTOR, INC., Petitioners, v. ENPLAS CORPORATION, Patent Owner, Inter Partes Review, Case Nos. IPR2014-00605 *et al.*, U.S. Patent Trial And Appeal Board.  
Project: *(With Labgold Law, Reston, VA)*  
Retained by Counsel for Patent Owner Enplas Corporation. Inter-partes reviews relating to liquid crystal display backlighting technology.

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#### *PROFESSIONAL ACTIVITIES AND CONSULTING*

Society memberships: IEEE, Optical Society of America, Sigma Xi.

Peer review:

- ◆ Reviewer of proposals for the U. S. National Science Foundation and *Esprit* (official research arm of the European Union).
- ◆ Guest Editor, *Applied Optics*.
- ◆ Reviewer of manuscripts for the scholarly journals: *Applied Optics*, *IEEE Transactions on Computers*, *Journal of Parallel and Distributed Computing*, *Optics Letters*, *Optical Engineering*, *Journal of the European Optical Society*, *IEE Proceedings on Optoelectronics*.
- ◆ Expert reviewer of active research projects for *Advanced Research Initiative in Microelectronics* (MEL-ARI) program of *Esprit*.

Conferences:

- ◆ Technical Program Committee, IEEE *LEOS 1997*, *LEOS 1998*.
- ◆ Technical Program Committee, *Optics in Computing 1998*, Bruges, Belgium.
- ◆ Program Co-Chair, *1999 Advanced Research in VLSI (ARVLSI-99)*, Atlanta, GA.
- ◆ Co-organizer, *Stanford Symposium and Workshop on High Definition Imaging*, September 10–11, 2009.

Engineering consulting and industrial residencies:

- ◆ *Jet Propulsion Laboratory of NASA, Pasadena, CA*: VLSI design and fabrication expertise for spatial light modulators.
- ◆ *Displaytech, Inc., Longmont, CO*: VLSI design and evaluation for silicon/ferroelectric-liquid-crystal spatial light modulators; Development of wafer-level microdisplay fabrication technology; Design and algorithms for advanced addressing of binary shutter arrays.
- ◆ *Siemens Corporate Research, Princeton, NJ*: VLSI design and evaluation for vertical-cavity-laser-based smart pixel arrays.
- ◆ *Sun Microsystems, Mountain View, CA*: Multiprocessor smart-memory architectures; High-speed inter-processor switching; Advanced die-attach technology.

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#### *PATENTS*

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