Thomas J. Brukilacchio, M.S., Ph.D.

Email: thomasb@innovationsinoptics.com
82 Cummings Park, Woburn, MA 01801
781-933-4477

EDUCATION

Doctor of Philosophy, Electrical Engineering and Computer Science Department May 2003
Tufts University, Medford, MA
Research Advisor: Dr. David Boas, Harvard University
"*A Diffuse Optical Tomography System Combined with X-Ray Mammography for Improved Breast Cancer Detection*"

Master of Science, Optical Engineering May 1984
Institute of Optics, University of Rochester, Rochester, NY
Graduate Research Advisor: Dr. Robert Boyd
"*Generation-Recombination Noise in Extrinsic Photoconductive Detectors*"

Bachelor of Science, Optical Engineering May 1982
Institute of Optics, University of Rochester, Rochester, NY
Undergraduate Research Advisor: Dr. Robert Boyd
Research topic: Detector proton bunching noise.

EXPERIENCE

Innovations in Optics, Inc., Woburn, MA May 1993 – Present

President and Founder

- Innovated high brightness Light Emitting Diode (LED) Array Modules and LED Illumination Systems for medical, commercial, industrial, and military applications. Primary inventor on several LED patents issued and pending.
- Designed and prototyped numerous spectroscopy based systems for medical and industrial applications. Integrated coherent and incoherent light sources, fiber optics, detectors, opto-mechanics, and electronics for systems spanning from near UV to Mid Infrared spectrum. Transitioned systems from prototype development to manufacturing.
- Designed and prototyped rigid and flexible visible endoscope systems including lens, illumination, and video system design.
- Designed and prototyped numerous visual systems including microscopes, loupes, polarization-based stereo endoscope with heads-up display video technology, liquid crystal display (LCD) based heads-up display illumination system, laser range finder.
- Conceived, designed, and prototyped fiber optic laser multiplexer for continuous wave (CW) and time-domain (TD) optical breast imaging system.

Vipera Systems, Inc., Huntingdon Valley, MD Jan 1996 – 2009

Vice President, Engineering, Founder

- Designed and facilitated human clinical trials of a rigid endoscope system for use in the visible and mid-infrared. Inventor and co-owner of 5 issued patents.

Optex Biomedical, Inc., The Woodlands, TX Oct 1992 – April 1993
Principal Electro-Optics Engineer

- Designed and facilitated continuous in-vivo fiber optic monitoring blood gas system.

C.R. Bard Inc., Critical Care Group, R & D Dept. Jan 1988 – Sept 1992
Staff Electro-Optics Engineer

- Conceived, designed and facilitated continuous in-vivo fiber optic monitoring blood gas system based on direct Mid-IR CO2 absorption, Oxygen quenching, and pH dye.
- Independently co-discovered field of Non-Imaging Optics with application to illumination.

Concepts in Electro-Optics, Inc., Reading, MA Apr 1988 – Dec 1991
President, Consulting Engineer, Founder

- Contract Engineering for Optical Design and Prototyping.

Hughes Aircraft Company, EDSG, El Segundo, CA Jun 1986 – Jan 1988
Systems Engineer

- Conceptual design of airborne infrared scanning detection systems.

TRW, Optics and Directed Energy Lab., Redondo Beach, CA Nov 1983 – Jun 1986
Optical Engineer

- Developed optical metrology systems for high power continuous wave chemical laser systems as part of the Strategic Defense Initiative.

PROFESSIONAL AFFILIATIONS

- Society of Physics and Instrumentation Engineers (SPIE)
- Illuminating Engineering Society of North America (IES)
- Optical Society of America (OSA)

RELATED PUBLICATIONS

- Brukilacchio, T., "Primary and Secondary Optic Materials – LED Luminaire Performance and Lifetime", LED- professional Review, Issue 15, 161 Sept/Oct(**2009**); doi:10.1117/12.529437

- Brukilacchio, T.; DeMilo, C., "Thermally induced stresses resulting from coefficient of thermal expansion differentials between an LED sub-mount material and various mounting substrates", Proc. SPIE, Vol. 6486, 64860N (**2007**); doi:10.1117/12.697489

- Brukilacchio, T.; DeMilo, C., "Beyond the limitations of today's LED packages: optimizing high-brightness LED performance by a comprehensive systems design approach", Proc. SPIE, Vol. 5366, 161 (**2004**); doi:10.1117/12.529437

RELATED PATENTS

- Brukilacchio, T., "LED Backlighting System with Closed Loop Control", US Patent Application US2009/0122533.
- Brukilacchio, T.; Conner, A., "Light Emitting Diode Illumination System", US Patent Application US2009/0040754.
- Brukilacchio, T., "LED Illuminator for Changing Target Properties", US Patent US7,488,102B2, Issued Feb 10, 2009.
- Brukilacchio, T., "High Intensity LED Array Illuminator", US Patent US7,488,101B2, Issued Feb 10, 2009.
- Brukilacchio, T., "LED White Light Illuminator", US Patent US7,488,088B2, Issued Feb 10, 2009.
- Brukilacchio, T.; Hart, D.; Rohaly, J.; "Three-Channel Camera Systems with Non-Collinear Apertures", US Patent Application US2008/0204900.
- Brukilacchio, T.; Hart, D.; Rohaly, J.; "Monocular Three-Dimensional Imaging", US Patent Application US2008/0013943.
- Brukilacchio, T., "LED Illuminator with Retro Reflector", US Patent US7,300,175B2, Issued Nov 27, 2007.
- Brukilacchio, T.; DeMilo, C., "Light Emitting Diode Projection System", US Patent Application US2007/0206390.
- Brukilacchio, T.; Hart, D.; Rohaly, J.; "Three-Channel Camera Systems with Collinear Apertures", US Patent Application US2007/0188769.
- Brukilacchio, T.; Hart, D.; Rohaly, J.; "Three-Channel Camera Systems with Collinear Apertures", US Patent Application US2007/0188601.
- Brukilacchio, T.; DeMilo, C.; Doyle, D.; Williamson, R., "Phosphor Deposition Method and Apparatus for Making Light Emitting Diodes", US Patent Application US2007/0128745.
- Brukilacchio, T., "LED White Light Optical System", US Patent US7,153,015B2, Issued Dec 26, 2006.
- Brukilacchio, T., "High Performance Light Engine", US Patent US6,857,772B2, Issued Feb 22, 2005.
- Brukilacchio, T.; Housholder, J; Hopkins, P, "Scanning Light Source System", US Patent US6,856,436B2, Issued Feb 15, 2005.
- Brukilacchio, T.; Mayshack, A. et al., "Illumination System Adapted for Surgical Lighting", US Patent US6,513,962B1, Issued Feb 4, 2003.