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Professional Profile

Dr. Liger is a manager in the Electrical Engineering and Computer Science practice at Exponent. His expertise lies at the intersection of semiconductor technology, sensor design and operation, statistics and inference. He brings over 15 years of experience in semiconductor sensors and systems and applies broad knowledge in physical electronics and sensing principles to solve complex engineering problems. He leverages his additional background in statistics to ensure that data translates into robust, defensible insights, driving practical results across automotive, wearable electronics, health AI, and autonomous driving applications.

Academic Credentials & Professional Honors

Ph.D., Electrical Engineering, California Institute of Technology (Caltech), 2006

M.S., Electrical Engineering, California Institute of Technology (Caltech), 2001

B.S., Electrical Engineering, Ecole Superieure D'Ingenieurs En Electronique, 2001

Academic Appointments

Affiliate Associate Professor, EE, University of Washington, 2011

Prior Experience

Sr Applied Scientist, Amazon, 2018-2023

Sr. Research Scientist, Amazon, 2016-2018

Sr Hardware Engineer, Amazon, 2014-2016

Hardware Engineer, Google, 2011-2014

Sr. Research Engineer, Robert Bosch LLC, 2007-2011

Research Engineer, Robert Bosch LLC, 2005-2007

Professional Affiliations

Governing Council Board Member, MEMS Industry Group, 2007-2011

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Patents

US Patent 7,238,941: Pyrolyzed Parylene Based Sensors and Method of Manufacture, issued July 3, 2007. Co-inventors: Tai YC, Liger M, Miserendino S, Konishi S.

US Patent 8,317,882: Method of Manufacturing a Planar Electrode with Large Surface Area, November 27, 2012 (Liger M, Miserendino S, Tai YC, Konishi S, Harder T)

US Patent 9,455,353: Substrate with Multiple Encapsulated Devices, September 27, 2016 (Chen PJ, Yama G, Liger M, Graham A)

US Patent 8,900,906: Atomic Layer Deposition Strengthening Members and Method of Manufacture, November 25, 2014 (Yoneoka S, Liger M, Yama G, Kodama T, Gunji M, Provine J, Howe RT, Goodson KE, Kenny TW).

US Patent 9,389,337: Selective Coating of a Component Using a Potting Process, July 12, 2016 (Wang CJ, Liger M, Hebenstreit JJ).

US Patent 9,046,684: Method for Selectively Treating Surfaces, June 2, 2015 (Feinstein C, Liger M, Wang CJ).

US Patent 9,288,915: IC-processed Polymer Nanoliquid Chromatography System on a Chip and Method of Making It, March 15, 2016 (Tai YC, He Q, Xie J, Pang C, Lee TD, Rodger D, Liger M)

US Patent 7,842,533: Electromagnetic Radiation Sensor and Method of Manufacture, November 30, 2010 (Liger M)

US Patent 7,790,226: Pyrolyzed Thin Film Carbon, September 7, 2010 (Liger M, Konishi S, Harder T, Miserendino S, Tai YC)

US Patent 7,378,655 B2: Apparatus and Method for Sensing Electromagnetic

Publications

Iyer S, Lee H, Liger M, Judy J, Candler R. Nonlinear damping for vibration isolation of microsystems using shear thickening fluid. Solid-State Sensors, Actuators and Microsystems Workshop (Hilton Head) 2012; 465–468.

Shingo Y, Lee J, Liger M, Yama G, Kodama T, Gunji M, Provine J, Howe RT, Goodson KE, Kenny TW. Electrical and thermal conduction in atomic layer deposition nanobridges down to 7 nm thickness. Nano Letters 2012; 12(2):683–686.

Yoneoka S, Liger M, Yama G, Schuster R, Purkl F, Provine J, Prinz FB, Howe RT, Kenny TW. ALD-metal uncooled bolometer. The 24th IEEE International MEMS Conference (MEMS'11).

Liger M, Tai Y-C. A 32*32 parylene-pyrolyzed carbon bolometer imager. The 19th IEEE International MEMS Conference (MEMS'06).

Liger M, Konishi S, Tai Y-C. Uncooled all-parylene bolometer. The 17th IEEE International MEMS Conference (MEMS'04).

Mizuno Y, Liger M, Tai Y-C. Nanofluidic flowmeter using carbon sensing element, The 17th IEEE International MEMS Conference (MEMS'04).

Konishi S, Liger M, Harder T, Tai Y-C. Parylene-pyrolyzed carbon for MEMS applications. The 17th IEEE International MEMS Conference (MEMS'04).

Hsieh H-T, Panotopoulos G, Liger M, Tai Y-C, Psaltis D. Athermal holographic filters. IEEE Photonics Technology Letters 2004; 16–1.

Liger M, Rodger DC, Tai Y-C. Robust parylene-to-silicon mechanical anchoring. The 16th IEEE International MEMS Conference (MEMS'03).

Liger M, Pornsin-Sirirak N, Tai Y-C, Ho S, Ho C-M. Large-area electrostatic-valved skins for adaptive flow control on ornithopter wings. Hilton Head 2002 Solid-State Sensor, Actuator, and Microsystems Workshop.

Pornsin-Sirirak N, Liger M, Tai Y-C, Ho S, Ho C-M. Flexible parylene-valved skin for adaptive flow control. The 15th IEEE International MEMS Conference (MEMS '02).

Project Experience

Dr. Liger focuses on autonomous and AI-driven systems, emphasizing sensor data analysis and uncertainty quantification. He leverages combined hardware and statistical modeling to design, validate, and diagnose complex sensor architectures in areas including automotive, ADAS and self-driving applications. He holds a Ph.D. in Electrical Engineering from the California Institute of Technology (Caltech), where his graduate work focused on semiconductor microfabrication and his dissertation focused on a novel organic microbolometer imager. More recently he obtained a M.S. in Statistics from the University of Washington, where he focused on analysis, modeling and inference.

Prior to his consulting career, Dr. Liger excelled in R&D roles at various technology companies. At Amazon, as leader of the sensor team for the company’s autonomous delivery robot initiative, he owned the “eyes and ears” of the Scout delivery robot - defining and integrating its sensor suite (radar, lidar, visible/infrared cameras, time-of-flight, ultrasound, inertial), balancing performance against cost, power, weight, and volume constraints, and running field trials to isolate hardware, environmental, or software failures. Before that at Amazon, he joined the newly formed Grand Challenge team as one of its inaugural members - building and managing its first machine-learning team to develop the clinical-text processing pipelines behind Amazon Comprehend Medical, AWS’s first healthcare AI service. Earlier, at Google[X], as a member of the nascent Google Glass project, he contributed to optical R&D, evaluated display and optics prototypes to inform the device’s design and technology roadmap, and established manufacturing workflows with contract partners. At Robert Bosch LLC’s Research and Technology Center, he developed advanced MEMS sensors for automotive applications, pioneering Atomic Layer Deposition to boost sensor sensitivity and durability.