

Exponent®
Engineering & Scientific Consulting

Susan Han, Ph.D., CFEI

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Professional Profile

Dr. Han's expertise is in electrical and electronic systems. Her professional activities focus on electronic system design review, safety evaluation, recall-related investigations, and product liability insurance and litigation.

Dr. Han works extensively on consumer products involving electronic systems. She has deep experience with battery energy storage systems. She conducts field inspections and root cause analysis of thermal incidents and arc flash events, performs gap analysis and risk assessment, and assists her clients with design review on an ongoing basis.

Dr. Han additionally has extensive experience in computer vision. She employs color space, image analysis of 2D and 3D data, deep learning, and principal component analysis (PCA) to understand the visual world. Dr. Han has led projects ranging from imaging system design, image acquisition, and software-hardware integration to image processing and interpretation.

Dr. Han completed her Ph.D. at the University of Massachusetts Amherst. Her research focused on numerical modeling and simulation of electron and hole transport in innovative semiconducting materials, including organic nanoparticle assemblies and hybrid perovskites, for photovoltaic devices. This involved coupled electrical and optical modeling to maximize the charge generation rate upon light exposure and photovoltaic device power conversion efficiency. She also has extensive experience in numerical modeling of species transport in ternary semiconductor quantum dots (QDs). This work provided design protocols for synthesizing thermodynamically stable ternary QDs through thermal annealing after their initial colloidal synthesis. Her Ph.D. work led to 6 publications and more than 10 conference presentations in total.

Prior to joining Exponent, Dr. Han worked as a statistical process control engineer in Intel Corporation. She has a strong background in applying state-space model and exponentially weighted moving average (EWMA) model for the development of feedforward and feedback control for 3D NAND memory production. She has significant experience with data analysis, virtual metrology development, and process control strategy development.

Academic Credentials & Professional Honors

Ph.D., Chemical Engineering, University of Massachusetts, Amherst, 2016

B.S., Chemical Engineering and English, Dalian University of Technology, China, 2010

Best Poster Award, Induced Voltage of Overhead De-energized Transmission Lines. COMSOL Conference, Boston, MA 2025

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Ovshinsky Student Travel Award, American Physical Society March Meeting, 2015

Licenses and Certifications

ASQ Certified Reliability Engineer

Certified Fire and Explosion Investigator (CFEI)

Certified Functional Safety Professional (ISO 26262 Automotive)

Certified Cybersecurity Professional and eXpert (ISO/SAE 21434)

Udacity Certified ML Engineer

Prior Experience

Process Control Engineer, Intel Corporation, 2016-2017

Professional Affiliations

Institute of Electrical and Electronic Engineers (IEEE)

National Association of Fire Investigators (NAFI)

Languages

Mandarin

Patents

US Patent 12,456,219 B1, Optical Weight Estimation System, Oct. 28, 2025

Publications

Han S, Arora A. Understanding Battery Energy Storage System (BESS) and Its Battery Management Systems (BMS). IEEE Symposium on Product Compliance Engineering (SPCE), 2026 (Accepted).

Mendias M, Garrido Menacho R, Han S. Application of ISO 26262 to Automotive Semiconductors. IEEE International Symposium on Product Compliance Engineering (ISPCE), 2026: 1-6.

Han S, Monk C, Kuykendal M. "Can Over-the-Air Updates Help Improve Vehicle Recall Compliance," Exponent Thought Leadership. August 2024.

Bag M, Renna LA, Jeong SP, Han X, Cutting CL, Maroudas D, Venkataraman D. Evidence for reduced charge recombination in carbon nanotube/perovskite-based active layers. Chemical Physics Letter 2016; 662, 35-41.

Renna LA, Bag M, Gehan TS, Han X. Lahti P, Maroudas D, Venkataraman D. "Tunable percolation in semiconducting binary polymer nanoparticle glasses," Journal of Physical Chemistry B 2016; 120, 2544-2556.

Han X, Bag M, Gehan TS, Venkataraman D, Maroudas D. "Analysis of charge transport and device performance in organic photovoltaic devices with active layers of self-assembled nanospheres," Journal of Physical Chemistry C 2015; 119, 25826-25839.

Han X, Bag M, Gehan TS, Venkataraman D, Maroudas D. "Analysis of hole transport in thin films and nanoparticle assemblies of poly(3-hexlthiophene)," Chemical Physics Letter 2014; 610-611, 273-277.

Maroudas D, Han X, Pandey SC. "Design of semiconductor ternary quantum dots with optimal optoelectronic function," AIChE Journal 2013; 59, 3223-3236.

Han X, Pandey SC, Maroudas D. "Kinetics of interdiffusion in semiconductor ternary quantum dots," Applied Physics Letters 2012; 101, 141906.

Book Chapters

Book ChaptersSurya Sharma, Janille Maragh, Susan Han, Chongyue Yi, Cathy Chen. Computer Engineering Applications in Electronic, Biomedical, and Automotive Systems. Nova Science Publishers, Chapter 3, April 2024.

Selected Presentations

Han S. Geometry Induced Electric Field Enhancement in Printed Circuit Board. COMSOL Conference, Boston, MA, 2026.

Han S., Mendias M. Application of ISO 26262 to Automotive Semiconductors. IEEE International Symposium on Product Compliance Engineering (ISPCE), Boston, MA, 2026.

Han S. USB-C Cable: Regulation Compliance and Product Safety. IEEE Internation Symposium on Product Compliance Engineering (ISPCE), San Francisco, CA, 2025.

Han S. Induced Voltage of Overhead De-energized Transmission Lines. COMSOL Conference, Boston, MA, 2025.

Han X, Maroudas D. Charge transport modeling in perovskite hybrid solar cells. AIChE Annual Meeting, Salt Lake City, UT, 2015.

Han X, Maroudas D. Charge carrier transport modeling in organic photovoltaic devices with active layers of P3HT/PCBM self-assembled nanoparticles. AIChE Annual Meeting, Salt Lake City, UT, 2015.

Han X, Maroudas D. Analysis of charge carrier transport in organic photovoltaic thin films and nanoparticle assemblies. APS March Meeting, Denver, CO, 2014.

Han X, Pandey SC, Maroudas D. Effects of composition and compositional distribution on the optoelectronic properties and function of semiconductor ternary quantum dots. AIChE Annual Meeting, San Francisco, CA, 2013.