



Exponent[®]
Engineering & Scientific Consulting

Susan Han, Ph.D.

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Professional Profile

Dr. Han assists clients in electronic systems failure analysis, especially the ones experienced thermal incidents. She has led projects on electronic system design review, safety evaluation, and failure analysis and recreation for a broad range of products including battery management systems, medical devices, power systems, and consumer electronics.

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 involving all the way from the design of imaging systems, image acquisition, 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

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

Licenses and Certifications

ASQ Certified Reliability Engineer

Certified Cybersecurity Professional and eXpert (ISO/SAE 21434)

Certified Functional Safety Professional (ISO 26262 Automotive)

CQI and IRCA Certified lead Auditor (ISO 9001:2015)

Udacity Certified ML Engineer

Languages

Mandarin

Publications

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-hexylthiophene). *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.

Selected Presentations

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.