

**Topic of the Speech:**

Fire Smoke Microphysics and Chemistry, and Predictive Exposure Models Through Materials Innovation

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Professor Guowen Song is the Professor and the Noma Scott Lloyd Chair in the Department of Apparel, Event and Hospitality Management at Iowa State University's College of Human Sciences. He received his Ph.D. degree in Textile Engineering, Chemistry and Science, at North Carolina State University's College of Textiles in Raleigh, North Carolina.

Song's academic interest is functional textiles and protective clothing for human safety and health. His interdisciplinary research team applies a combined modeling and lab simulation approach to the study of protective system and its related technology. The research covers novel textile materials, system design, the simulation of hazards, PPE contamination, the analysis and prediction of clothing performance, as well as the development of new methods and standards. Dr. Song applies emerging technologies, including instrumented (flash fire, hot liquid, and sweating) manikins and 3D body scanning, smart wearables, 3D printing technology, and specialized human trials for material and product design. Recently he has been exploring a systematic and convergent approach to current PPE challenges, such as extremities, contamination and product fit and sizing. Recent efforts have also been placed on establishing AI and machine learning-powered models and simulations for developing intelligent interfaces and enhancing human-centered PPE design.

Dr. Song has published over 130 scientific papers in peer-reviewed journals and conference proceedings. He has authored four books and contributed a dozen chapters to books in his field of study.