CV (last updated: 3/17/2019)

**Xuewei Zhang**

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**Education Record**

**Massachusetts Institute of Technology,** Ph.D., Electrical Engineering. June 2014 **Tsinghua University (Beijing, China),** M.S./B.S., Electrical Engineering, July 2009/2007

**Employment History**

**Research/teaching assistant, September 2009 — June 2014, MIT**

Dept. of EEC S, Research Laboratory of Electronics (RLE)

**Postdoctoral scholar, September 2014 — June 2015, UCLA**

Dept. of Physics & Astronomy, California NanoSystems Institute (CNSI)

**Assistant professor (tenure-track), September 2015 — present, TAMU-Kingsville** Dept. of EECS, Ph.D. Program in Sustainable Energy Systems Engineering (ESEN)

**Technical Expertise**

**Applied Physics:** plasma physics, dielectric physics, nonlinear physics, electrohydrodynamics, electro-optics **Electric Power Engineering;** power systems, high voltage engineering, electricity markets, renewable energy **Computer Science:** image processing and analysis, machine learning

**Research Areas**

1. **Lightning physics and lightning protection**
2. **Electrical insulation and dielectric phenomena**

**(BI)** Mechanisms and dynamics of dielectric breakdown in insulating materials

**(B2)** Smart material system designs to improve insulation in high voltage equipment

1. **Sustainable energy systems design**
2. **Other** (control and optimization, energy harvesting, engineering education, etc.)

**Teaching Experience**

**Instructor-G (with full responsibility), 2013 Fall, MIT** 6.641: Electromagnetic Fields, Forces, and Motions **Recitation instructor (TA), 2014 Spring,** MIT 6.262: Discrete Stochastic Processes

**Adjunct instructor, 2015 Spring,** Univ. of the West (Rosemead, CA) PSC100: Introduction to Physical Sciences **Instructor (volunteer), 2015 Summer,** Univ. of the People (Online) CS 4407: Data Mining and Machine Learning **Instructor, 2015-16 (5 TAMTJK subjects),** EEEN 3321 Electronics **I,** EEEN 4342 Electronics II, EEEN 3333 Linear Signals and Systems, EEEN 3324 Electromagnetics, ESEN 6312 Energy System Integration & Design

**Instructor, 2016-17 (4 TAMUK subjects),** EEEN 332 l Electronics I, ESEN 6329 Multiphysics Modeling, EEEN 3324 Electromagnetics. ESEN 6312 Energy System Integration & Design

**Instructor, 2017-18 (5 TAMUK subjects),** ESEN 6321 Smart Grids, ESEN 6329 Multiphysics Modeling, EEEN 3324 Electromagnetics, ESEN 6312 Energy System Integration & Design, ESEN 6102 Seminar

**Instructor, 2018-19 (6 TAMUK subjects),** ESEN 6313 Advanced Engineering Math, EEEN 5303.803 Stochastic Processes, ESEN 6102 Seminar in ESEN, CSEN 2303 Introduction to Computing with Basic and Excel, ESEN 6312 Energy System Integration and Design, and ESEN 6334 Energy Resource Management and Optimization

**Publications and Presentations**

**Thesis and Dissertation**

*X Zhang,* Fractals in Gas Discharges: Models and Applications (Master's degree thesis), Tsinghua Univ. (2009), [A] *X Zhang,* Kerr Electro-Optic Measurements in Liquid Dielectrics (Ph.D. dissertation), MIT (2014), [F111

CV (last updated: 3/17/2019)

**Journal Publications**

*X. Zhang,* L. Dong, J. He, S. Chen, and R. Zeng, "Study on the Effectiveness of Single Lightning Rods by a Fractal Approach," Journal of Lightning Research 1, 1 (2009). [A

J. He, *X Zhang,* L. Dong, R. Zeng, and Z. Liu, "Fractal Model of Lightning Channel for Simulating Lightning Strikes to Transmission Lines," Science in China Series E: Technological Sciences 52, 3135 (2009). [A]

*X Zhang, J.* K. Nowocin, and M. Zahn, "Evaluating the Reliability and Sensitivity of the Kerr Electro-optic Field Mapping Measurements with High-voltage Pulsed Transformer Oil," Applied Physics Letters 103, 082903 (2013). [B1]

1. *Zhang* and M. Zahn, "Kerr Electro-optic Field Mapping Study of the Effect of Charge Injection on the Impulse Breakdown Strength of Transformer Oil," Applied Physics Letters 103, 162906 (2013). 1B11

*X Zhang* and M. Zahn. "Electro-optic Precursors of Critical Transitions in Dielectric Liquids," Applied Physics Letters 104, 052914 (2014). [111]

*X Zhang* and M. Zahn, "Fractal-like Charge Injection Kinetics in Transformer Oil Stressed by High Voltage Pulses," Applied Physics Letters **104,** 162901 (2014). 11311

*X Zhang,* "Electro-optic Signatures of Turbulent Electroconvection in Dielectric Liquids." Applied Physics

Letters 104, 202901 (2014). [B **1]**

*X Zhang, Y.* Zhu, S. Gu, and J. He, "Dynamics of Branching of Negative Downward Lightning Leaders," Applied Physics Letters 111, 224101 (2017).[A]

1. Zhu, *X Zhang* (co-first author), and J. He, "Predicting Streamer Discharge Front Splitting by Ionization Seed Profiling," Physics of Plasmas, 26, 023513 (2019). [A]

*X Zhang* and M. Shneider, "Dynamic Modeling of Carbon Nanofiber Growth in Strong Electric Fields," (in publication, Journal of Applied Physics). r1321

**Conference; Peer-reviewed Papers**

*X Zhang,* J. K. Nowocin, and M. Zahn, "Effects of AC Modulation Frequency and Amplitude on Kerr Etectro-Optic Field Mapping Measurements in Transformer Oil," Annual Report IEEE Conference on Electrical Insulation and Dielectric Phenomena, Oct. 15-17, 2012, Montreal, Canada, pp. 700-4. 1B1]

*X Zhang,* J. K. Nowocin, and **M.** Zahn, "Experimental Determination of the Valid Time Range for Kerr Electro-Optic Measurements in Transformer Oil Stressed by High-voltage Pulses," Annual Report IEEE Conference on Electrical Insulation and Dielectric Phenomena, Oct. 20-23, 2013, Sherizhen, China, pp. 523-6. [111]

*X Zhang* and M. Zahn, "Desynchronization Waves in Power Grids Described by Kuramoto Model," Proceedings of International Conference on Information, Business and Education Technology (Atlantis Press), Mar. 14-15, 2013, Beijing, China, pp. 1350-3. [Cl

M. Lainfiesta and *X Mang,* "Evolutionary Paths toward Prosumer Marketplace," The International Conference on Electrical Engineering (Chinese Society of Electrical Engineers). Jul. 4-7, 2017, Weihai, China, pp. 539-42. IC]

M. Lainfiesta,X *Zhang,* and R. Sunday, "Design of Solar-Powered Microgrid at Texas A &M University-Kingsville," 2018 IEEE Texas Power and Energy Conference (TPEC), Feb. 8-9, 2018, College Station, TX, pp. 1-6. doi: 10.1109/TPEC.2018.8312118. [Cl

*X. Zhang,* S.-W. Park, M. Lainfiesta, and **M,** Green, "Power-Up: A Model for Increasing Career Readiness in Power Engineering at Minority-Serving Institutions," 2018 IEEETES Transmission and Distribution Conference and Exposition (T&D), Apr. 17-19, 2018, Denver, CO, pp. 1-5, doi: 10.1109/TDC.2018.8440293. [I)]

S. A. Subramanyam and *X Zhang,* "Electricity Market Mechanism Design for Grid-Connected Prosuming Communities," 2018 IEEE International Conference on Electronnformation Technology (EIT), May. 3-5, 2018, Rochester, MI, pp. 18-22, doi: 10.1 109/EIT.2018.8500212. *[C]*

*X. Zhang,* "Design and Modeling of Smart Material Systems for High Voltage Applications," 2018 IEEE Electrical Insulation Conference (EIC), Jun. 17-20, 2018, San Antonio, TX, pp. 377-380, doi: 10.1109/EIC.2018.8481056. [B2]

M, Lainfiesta and *X Zhang,* "Planning a Solar-Powered Microgrid for Remote Rural Communities on Mountainous Terrain," 2018 ASME Power Conference, Jun. 24-28, 2018, Lake Buena Vista, FL, pp. V001T06A028 (6 pages), doi:10.1115/POWER2018-7525. I

S. A. Subramanyam and *X Zhang,* "Iterative Mechanism for Two-Sided Electricity Markets with Variable Renewable Energy Sources," IEEE Conference on Technologies for Sustainability, Nov. 11-13, 2018, Long Beach, CA. [Cl

H. Hayajneh, S. Bashetty, **M.** B. Salim, and *I Zhang,* -Techno-Economic Analysis of a Battery Energy Storage System with Combined Stationary and Mobile Applications," IEEE Conference on Technologies for Sustainability, Nov.

* 11-13, 2018, Long Beach. CA. [C.]

CV (last updated: 3/17/2019)

T. Kim, *X Zhang,* S.-W. Park, **J.** Zeng. and C. Wei, "A Novel Phase-Locked Loop-Enabled Power Estimator for Single-Phase Power Electronic Converters," 2018 IEEE 3rd International Conference on Integrated Circuits and Microsystems (ICICM), Nov. 24-26, 2018, Shanghai, China, pp. 240-4, doi: 10.1 109/ICAM.2018.8596626. IC1

M. Lainfiesta, S. A. Subramanyam, and *X Zhang,* "Robust Control and Optimal Operation of Multiple Microgrids with Configurable Interconnections," IEEE Green Technology Conference, Apr. 3-6, 2019, Lafayette, LA. **[C]**

H. Hayajneh, M. B. Salim, S. Bashetty, and ***X*** *Zhang,* "Optimal Planning of Battery-Powered Electric Vehicle Charging Station Networks," IEEE Green Technology Conference. Apr. 3-6, 2019, Lafayette, LA. [C]

S. Subramanyam, *X Zhang,* **J.** Wu, and H. Song, "Dynamic Analysis of Operating Reserve Demand Curve in Energy-Only Electricity Markets," (Accepted, IEEE PES ISGT Asia, May 21-24, 2019, Chengdu, China). [C]

M. Lainfiesta, *X Mang,* ***J.*** Wu. and H. Song, "Developing a Decision Support System for the Optimal Operating Strategies of a Polygeneration Facility," (Accepted, IEEE PES ISGT Asia, May 21-24, 2019, Chengdu, China). [C] **Conference: Presentation/Abstract Only**

**J.** Jadidian, *Zhang,* J. K. Nowocin, and M. Zahn, "Numerical Modeling of Streamer Discharges in Liquid Dielectric Materials (invited workshop)," IEEE Conference on Electrical Insulation and Dielectric Phenomena, Oct. 15-17, 2012, Montreal, Canada. [B1]

*X Zhang,* "Toward a Variational Principle of Space Charge Stimulated Discharge in Electron Irradiated PMMA (poster)," SIAM Conf. on Mathematical Aspects of Materials Science, May 8-12, 2016\_ Philadelphia, PA. [B 1]

*I Zhang,* "High Voltage Electrodes Injecting Charges Electrohydrodynamically," ASME 14th International Conf. on

Nanochannels, Microchannels, and Minichannels, July 10-14, 2016, Washington, DC. [B2]

* *Zhang,* "Porous Electrode Swelling: Effects of lnhoniogeneity and Geometry (poster)," APS March Meeting, Mar.

13-17, 2017, New Orleans, LA. [B2]

*I Zhang* and A. Hernandez, "Modeling a Circular Dielectric Elastomer Actuator under Dynamic Excitations (oral)," ASME Conf. on Smart Materials, Adaptive Structures, and Intelligent Systems, Sep. 18-20, 2017, Snowbird, UT. [132]

*X. Zhang* and M. Shneider, "Effect of Strong Electric Field on Plasma-Enhanced Catalytic Growth of Carbon Nanofibers (oral)," 71st Annual Gaseous Electronics Conference, Nov. 5-9, 2018, Portland, OR. [132]

*X Zhang,* -Supply Chain Management Models for Mobile Battery Energy Storage Systems," 2019 International Battery Association (IBA) Meeting, Mar. 3-8, 2019, La Jolla, CA. [Cs]

*X Zhang,* "AC Response of Coupled Phase Oscillators with Inertia (oral; accepted)," SIAM Conference on Applications of Dynamical Systems (DS19), May 19-23, 2019, Snowbird, UT. [C]

*X. Zhang,* "Optimal Control of a Nonlinear Telegraph Equation with Switching Parameters (oral; accepted)," SIAM Conference on Control and Its Applications (CT19), Jun. 19-21, 2019, Chengdu, China. DI

S. A. Subramanyam and X *Zhang,* "Modeling Disaster Recovery of Tourism Destinations (accepted)," ASCE International Conference on Sustainable Infrastructure, Nov. 7-9, 2019, Los Angeles, CA. [C]

**Papers under Review with Journals**

M. Lainfiesta and *X Zhang,* "Study on the Control and Operation of Multi-Microgrid Systems," (Journal of Modern Power System and Clean Energy). ***[C]***

M. Lainfiesta and *X Mang,* "Data-driven Modeling for the Optimal Planning and Operation of Polygeneration Facilities," (Energies). [C]

**J. Wu,** *X Zhang* (co-first author), V. Qu. and H. Song, "Low Frequency Oscillations in Networks of Coupled Phase Oscillators with Inertia," (Scientific Reports). [C]

**Full Papers Submitted to Conferences**

H. Hayajneh and *X Zhang,* "Toward a Framework of Social Welfare Assessment of Wind Energy Systems," (2019 2nd **International** Conference on Clean Energy and Electrical Systems). [C]

11. Hayajneh, M. B. Salim, S. Bashetty, and *X. Zhang,* "Logistics System Management for Battery-Powered Electric Vehicle Charging Station Networks," (2019 2nd International Conference on Clean Energy and Electrical Systems). **[C] Abstracts/Extended Abstracts Submitted to Conferences**

*X. Zhang,* "Electrohydrodynamics of Charge-Injecting High-Voltage Electrodes," (2019 IEEE Conference on Electrical Insulation and Dielectric Phenomena). [B2]

*X Zhang* and Y. Zhu, "Boundary and Interface Effects on Charge Relaxation Dynamics," (2019 **IEEE** Conference on Electrical Insulation and Dielectric Phenomena). [Bll

CV (last updated: 3/17/2019)

4

*X Zhang, "Modified* Kelvin Water Droppers for Energy Harvesting." (2019 ASME Conference on Smart Materials, Adaptive Structures and Intelligent Systems). I D]

*X Zhang,* "A Theoretical Study of Ferrofluid Generator Powered by Waste Heat and Ambient Vibration," (2019 ASME Conference on Smart Materials, Adaptive Structures and Intelligent Systems). [D]

**Grants and Projects**

**Research**

* *Collaborative STEM Learning in Informal Settings,* PI, 7/2017-12/2019, $162k, private donation.
* *Blueprints of Energy-Smart Communities in South Texas,* co-PI, 9/2017-8/2018, $15k, TAMUK.
* *Why Backup Power Generations Fail during Hurricane?* **PI, 1/2018** - 6/2018, $5k, TAMUK.
* *Sustainable Development of Smart Green Communities,* PI, 7/2018 - 12/2020, $225k, Luohe-Guoqi (China).
* **Pending:** A *Simulation-based Decision Support System for Disaster Recovery and Resilience Planning,* P1, 7/2019 - 6/2020, $ 175k, Department of Commerce, Economic Development Agency.

**Education/Outreach**

* *Research Apprenticeship and Community Outreach on the Future of Energy in South Texas,* PD, 1/2018 - 12/2018,

$15.5k, IEEE (EPICS), Best Buy Foundation, and H-E-B Tournament of Champions Charitable Trust.

* *Windolkers Jr.: A 1-week Summer Camp on Cryptography,* PD, 6/2016, $2.7k, 1-1-E-B and Walmart Foundation.
* *Nature-inspired Engineering Design Experiences for Under-served Youth,* PD, 6/2016 - 7/2017, $6.9k, IEEE.
* *Building Smart Communities,* PD, 712017 - 12/2017, $4.8k, H-E-B, Walmart, and Best **Buy.**

**Supervising and Mentoring**

**Ph.D. Students** (3): Maximiliano Lainfiesta, Sreelatha Subrarnanyam, 1-lassan Hayajneh **Staff Research Assistant (2):** Peichong Zhang, Xuanyao Wang

**Undergraduate Students (2):** Alexander Hernandez (graduated), Hayden Judson

**Other Information**

**Graduate, Ph.D., and** postdoc advisors:

Jinliang He (Tsinghua), Markus Zahn (MIT), Jianwei Miao (UCLA)

**Honors and awards:**

2003 Tsung-Dao Lee Scholarship (Excellence in Higher Education Entrance Examination)

2004 First Prize of Physics Contests for Beijing College Students

2005 Third Prize of Mathematics Contests for Beijing College Students

2005 HSBC Scholarship (Excellence in Academic Performance)

2007 Friend of Tsinghua Scholarship (Excellence in Academic Performance)

2009 First Place Prize awarded by Lightning Protection Standardization Committee of China

2009 Best Thesis Award from Dept. Electrical Engineering, Tsinghua University

2010 E. E. Landsman Fellowship from Dept. EECS, Massachusetts Institute of Technology

**Committee member of**

TAMUK Dept. EECS Committee on Graduate Curriculum (0912015 — present)

TAMUK College of Engineering Research Council (09/2015 — 08/2017)

**Membership of professional societies and associations**

**IEEE, APS,** SIAM, ASME, AAAS

**Reviewer of**

**Journal** of Electrostatics, Journal of Applied Physics, IEEE Transaction on Plasma Science, IEEE Transaction on Electromagnetic Compatibility, Energies, IEEE PES Conferences, etc.

**Organizer of**

ASME SMASIS 2017 (track co-chair)

**Technical committee for**

International Conference on Modern Educational Technology 2019

**Collaboration with**

Princeton University, Texas A&.M University, Tsinghua University (China), Xinjiang University (China), Harbin Institute of Technology-Weihai (China), AEP Texas (Corpus Christi, TX). CFD Research Corporation (Huntsville, AL), EEGSA Group (Guatemala), Shemar Electric Co., Ltd. (China), NR Electric Co., Ltd. (China), Corpus **Christi ISD**