YANJUN QIAN

Assistant Teaching Professor
Department of Mathematics
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EDUCATION

Texas A&M University — College Station, TX
Ph. D. in Industrial & Systems Engineering — 2012 - 2018

Tsinghua University — Beijing, China
M. S. in Automation — 2009 - 2012

Tsinghua University — Beijing, China
B. S. in Automation — 2005 - 2009

PROFESSIONAL EXPERIENCES

Assistant Teaching Professor — 2026 - Present
Syracuse University — Syracuse, NY
Department of Mathematics

Assistant Professor — 2018 - 2026
Virginia Commonwealth University — Richmond, VA
Department of Statistical Sciences and Operations Research

TEACHING EXPERIENCE

Undergraduate-Level Courses

In the Department of Mathematics, Syracuse University:

- Elementary Probability and Statistics I (MAT 221), Fall 2026.
- Elementary Probability and Statistics II (MAT 222), Fall 2026.

In the Department of Statistical Sciences and Operations Research, Virginia Commonwealth University:

- Intro to Contemporary Math (MATH 131), Spring 2025.
- Basic Practice of Statistics (STAT 210), Fall & Spring 2023 - 2026.
- Applied Statistics for Engineers and Scientists (STAT 441), Summer 2020.

In the Department of Industrial & Systems Engineering, Texas A&M University:

- Economic Analysis of Engineering Projects (ISEN 302), Fall 2016 & Spring 2017.

Graduate-Level Courses

In the Department of Statistical Sciences and Operations Research, Virginia Commonwealth University:

- Statistical Data Science I (STAT 534), Fall 2021.
- Machine Learning Algorithms (STAT 636), Spring 2020 - 2023, 2025.
- Machine Learning Algorithms II (STAT 736), Fall 2022.
- Statistical Quality Control (STAT 649), Spring 2019, 2021, 2024.
- Applied Statistical Analysis (STAT 641), Fall 2018 - 2025.

RESEARCH INTERESTS

Reliable Machine Learning for Scientific and Engineering Applications. Develop machine learning models incorporated with statistical learning and physics mechanisms to improve their reliability, with applications in environmental science and chemical engineering.

Model Comparison and Uncertainty Assessment for Medical and Public Health Problems. Compare and assess the model performance and uncertainty for readmission monitoring, infectious disease prediction, and mental health analysis.

Statistical Analysis for Non-Traditional Datasets. Implement statistical data analysis for non-traditional datasets, such as images/videos and survey data with open-ended questions.

RESEARCH EXPERIENCE

- **Assistant Professor, Virginia Commonwealth University**, 2018 - Present.
  Department of Statistical Sciences & Operations Research.

  Reliability and Uncertainty in Applied Machine Learning: Analyze and improve the reliability and uncertainty of machine learning methods with applications in spectral prediction in chemistry and mental health studies from survey data.

  Data Science on Material and Chemical Engineering Images: Propose data-enhancing and analytics methods for the material imaging data, e.g., super-resolution for electron microscopic images and slug size measures for the slug flow process.

  Statistical Analysis for Medical Data: Propose statistical analysis methods for medical studies, e.g., brain connectivity estimation from fMRI data, correlation analysis from surgical records, and readmission monitoring for post-procedure care.

- **Research Assistant, Texas A&M University**, 2012 - 2018.
  Advanced Metrology Lab, Department of Industrial & Systems Engineering.

  Nanoparticle Detection from Noisy TEM Images: Proposed a robust and accurate algorithm to detect and characterize nanoparticles from noisy transmission electron microscope (TEM) images, by combining the intensity and gradient-based image information.

  Nanocrystal Growth Monitor via In Situ TEM Videos: Proposed an automatic tool to analyze a nanocrystal growth process from *in situ* TEM videos. The proposed method can capture time-varying particle size distributions to depict and monitor the dynamic process.

- **Research Assistant, Tsinghua University**, 2009 - 2012.
  Broadband Network & Digital Media Lab, Department of Automation.

  Multiview Stereo Reconstruction: Produced Matlab code of majorization-minimization optimization strategy for corrupted matrix recovery from the perspective of compressive sensing. The proposed algorithm can fuse noisy depth maps to construct a 3D model for multiview stereo reconstruction.

  Image Understanding and Categorization: Proposed a novel codeword assignment algorithm from the perspective of manifold learning that breaks the restrictions of typical Euclidean distance, which can improve the accuracy of natural image understanding and synthetic-aperture radar (SAR) image identification.

PUBLICATIONS

Publications in Refereed Journals and Transactions

Published or Accepted (* indicates the corresponding authorship)

J.1 Alexander Maret, Cade Dees, Yule Fu, **Yanjun Qian***, David Chan, Punit Gandhi, and Indranil Sahoo, "Comparative Analysis of NLP Methods for Emotion Detection in Student Responses during COVID-19", *New England Journal of Statistics in Data Science*, In Press, 2026.

J.2 Muhammed ALjifri, Carter Miller, **Yanjun Qian***, Ye Chen, Mo Jiang, "Beyond Beer-Lambert Linear Regression: Multi-Layer Modeling for Wide-Range Concentration Quantification Using UV-Vis Spectroscopy", *Analytical Science Advances*, vol. 7, no. 1, pp. e70078, 2026.

J.3 Muhammed Aljifri, **Yanjun Qian***, Kunal Patel, "Machine Learning-based Risk Adjusted CUSUM Control Chart for Monitoring Readmission Rate Following PTBD Catheter Placement", *Quality Reliability Engineering International*, vol. 42, no. 3, pp. 933–949, 2026.

J.4 Elizabeth Amona, Alexis West, Afton White, Indranil Sahoo, David M. Chan, Punit Ganhdi, **Yanjun Qian**, "Breakdown of COVID effects on students' mental health at the beginning of the pandemic", *PLOS Mental Health*. vol. 1, no. 6, 2025.

J.5 **Yanjun Qian***, Joel Hulsizer, Mingyao Mo, Consuelo Vega Zambrano, Ema Smith, Mo Jiang, "Automatic Measurement of Slug Flow Processes using Inline Videos", *IET Image Processing*, vol. 18, pp. 2038–2052, 2024.

J.6 Jifang Zhao, Qiong Zhang, Montserrat Fuentes, **Yanjun Qian***, Liangsuo Ma, Gerard Moeller, "A Spatiotemporal Model for Detecting the Effect of Cocaine Use Disorder on Functional Connectivity", *Spatial Statistics*, vol. 45, pp. 100530, 2021.

J.7 **Yanjun Qian***, Jiaxi Hu, Lawrence F. Drummy, and Yu Ding, "Effective super-Resolution method for paired electron microscopic images", *IEEE Transactions on Image Processing*, vol. 29, pp. 7317-7330, 2020.

J.8 Josephina A. Vossen, Mashya Abbassi, **Yanjun Qian**, Curtis W. Hayes, Peter Haar, and Kevin Hoover, "Correlation between the accessory anterolateral talar facet, bone marrow edema and tarsal coalitions", *Skeletal Radiology*, vol. 49, no. 5, pp. 699-705, 2020.

J.9 **Yanjun Qian**, Jianhua Z. Huang, Chiwoo Park, and Yu Ding, "Fast dynamic nonparametric distribution tracking in electron microscopic data", *The Annals of Applied Statistics*, vol. 13, no. 3, pp. 1537-1563, 2019.

J.10 **Yanjun Qian**, Jianhua Z. Huang, and Yu Ding, "Identifying multi-stage nanocrystal growth using in-situ TEM video data", *IISE Transactions*, vol. 49, no. 5, pp. 532-543, 2017.

J.11 Ling Dong, Xiaodong Li, **Yanjun Qian**, Dan Yu, Hui Zhang, Zhong Zhang, and Yu Ding, "Quantifying nanoparticle mixing state to account for both location and size effects", *Technometrics*, vol. 59, no. 3, pp. 391-403, 2017.

J.12 **Yanjun Qian**, Jianhua Z. Huang, Xiaodong Li, and Yu Ding, "Robust nanoparticles detection from noisy background by fusing complementary image information", *IEEE Transactions on Image Processing*, vol. 25, no. 12, pp. 5713-5726, 2016.

J.13 Yue Deng, Yipeng Li, **Yanjun Qian**, Xiangyang Ji, and Qionghai Dai, "Visual words assignment via information-theoretic manifold embedding", *IEEE Transactions on Cybernetics*, vol. 44, no. 10, pp. 1924-1937, 2014.

Under Review

J.14 Stephen Tivenan, Indranil Sahoo, **Yanjun Qian**, "A Statistical Framework for Spatial Boundary Estimation and Change Detection: Application to the Sahel-Sahara Climate Transition", submitted to *Environmetrics*, Revision.

J.15 Sahil Chindal, Elizabet Estallo, **Yanjun Qian**, Michael Robert, "Investigating Associations between Google Trends and Dengue Incidence in Córdoba, Argentina Using Machine Learning Methods", submitted to *PLOS Digital Health*, Revision.

J.16 Ethan Shearer, Ninel Páez Carrión, Jason Jackson, Elizabeth Amona, **Yanjun Qian**, David Chan, Indranil Sahoo, "Causal Inference Analysis of Mental Health Trends Among Students During the COVID-19 Pandemic", submitted to *PLOS Mental Health*.

J.17 Mo Li, Muhammed ALjifri, **Yanjun Qian***, QiQi Lu, "Multiple Changepoint Detection for Autocorrelated Ordinal Time Series", submitted to *Journal of Statistical Computation and Simulation*.

Publications in Refereed Conference Proceedings

C.1 Katie Zhang, **Yanjun Qian**, Vivian Motti, Carol Fung, "A Study on the Privacy Concerns of the Internet of Things", *In Proceeding of 7th Cyber Security in Networking Conference (CSNet)*, Montreal, Canada, 2023.

C.2 Carol Fung, Vivian Motti, Katie Zhang, **Yanjun Qian**, "A Study of User Concerns about Smartphone Privacy", *In Proceeding of 6th Cyber Security in Networking Conference (CSNet)*, Rio de Janeiro, Brazil, 2022.

C.3 Yue Deng, **Yanjun Qian**, Yipeng Li, Qionghai Dai, and Guihua Er, "Visual words assignment on a graph via minimal mutual information loss", *In Proceeding of British Machine Vision Conference*, 2012.

C.4 **Yanjun Qian**, Qionghai Dai, and Guihua Er, "Self-adaptive normal estimation and position adjustment for MVS reconstruction", *In Proceeding of 3DTV Conference*, 2011.

Working Papers

1. Sahil Chindal, **Yanjun Qian**, Michael Robert, "Physics-Informed Deep Learning for Prediction Dengue Outbreak in Dominican Republic". In preparation for *International Journal of Infectious Diseases*.
2. Alexandra Ulbing, **Yanjun Qian**, Mo Jiang, "Conformal Prediction with Ensemble Models for Spectroscopic Quantification of Metal Ions". In preparation for *The Annals of Applied Statistics*.

PRESENTATIONS

Conference Presentations

1. "Conformal Prediction with Ensemble Models for Spectroscopy Quantification", INFORMS Annual Meeting, Atlanta, GA, Oct. 28th, 2025.
2. "Machine Learning-Based Risk Adjusted Cusum Control Chart for Monitoring Surgery Readmission Rate", INFORMS Annual Meeting, Seattle, WA, Oct. 21st, 2024.
3. "Automatic Analysis and Transfer Learning for Continuous Chemical Manufacturing", INFORMS Annual Meeting, Phoenix, AZ, Oct. 17th, 2023.
4. "Automatic Analysis for Slug-Flow Process in Continuous Chemical Manufacturing", International Conference on QSR, Raleigh, NC, Jun. 7th, 2023.
5. "Automatic Analysis for Slug-Flow Process in Continuous Chemical Manufacturing", POMS Annual Conference, Orlando, FL, May. 23, 2023.
6. "Data Science-Driven Monitoring of Slug Flow Process in Crystallization Synthesizing", INFORMS Annual Meeting, Indianapolis, IN, Oct. 16th, 2022.
7. "Automatically Monitoring Slug-Flow Process of Continuous Crystallization", INFORMS Annual Meeting, virtual, Oct. 27th, 2021.
8. "Non-Invasive Particle Size Distribution Estimation Based On Dynamic Imaging Data", INFORMS Annual Meeting, virtual, Oct. 20th, 2020.
9. "Data-Driven SEM Image Enhancement for Nanomaterial Analysis", INFORMS Annual Meeting, Seattle, WA, Oct. 23rd, 2019.
10. "Data-Driven SEM Image Enhancement for Nanomaterial Analysis", Spring Research Conference, Blacksburg, VA, May. 23rd, 2019.
11. "Data-Driven SEM Image Enhancement for Nanomaterial Analysis", IISE Annual Conference and Expo, Orlando, FL, May. 19th, 2019.
12. "Statistical modeling and analyzing methods for dynamic nanomaterial video data", INFORMS Annual Conference, Phoenix, AZ, May. 19th, 2019.

13. “Quantifying nanoparticle mixing state to account for both location and size effects”, INFORMS Annual Conference, Houston, TX, Oct. 24th, 2017.
14. “Identifying multistage nanocrystal growth using *in situ* TEM video data”, INFORMS Annual Conference, Houston, TX, Oct. 23rd, 2017.
15. “Online nanocrystal growth monitoring from *in situ* TEM video”, INFORMS Annual Conference, Nashville, TN, Nov. 14th, 2016.
16. “Multi-stage nanocrystal growth identifying and modeling via *in situ* TEM video”, INFORMS Annual Conference, Philadelphia, PA, Nov. 2nd, 2015.
17. “Robust nanoparticles detection by fusing complementary image information”, INFORMS Annual Conference, San Francisco, CA, Oct. 29th, 2014.

Invited Talks

1. “Statistical Modeling and Analysis for Imaging Data from Engineering Experiments”, Invited Talk in Chemical & Life Science Engineering Department at VCU, Richmond, VA, Mar. 26th, 2024.
2. “Statistical Analysis Methods for Dynamic Nanomaterial Data”, Invited Talk in Physics Colloquium at VCU, Richmond, VA, Feb. 14th, 2020.
3. “Automatic Analysis Methods for Dynamic Nanomaterial Data”, Invited Talk in ECE Department at VCU, Richmond, VA, Nov. 1st, 2019.
4. “System informatics and data science methods for material and manufacturing”, Army Research Lab visit, Texas A&M University, College Station, TX, Jun. 27th, 2017.
5. “Multi-stage dynamic growth model of nanoparticles”, AFOSR Project Review Meeting, Georgia Institute of Technology, Atlanta, GA, Aug. 3rd, 2014.
6. “A robust algorithm for nanoparticle detection & segmentation”, AFOSR Project Review Meeting, Florida State University, Tallahassee, FL, Jun. 10th, 2013.
7. “Turn data mining into big cost savings”, Dow Chemical Big Data Competition, Texas A&M University, College Station, TX, Apr. 17th, 2013.

PROFESSIONAL ACTIVITIES

Professional Memberships

- Institute for Operations Research and the Management Sciences (INFORMS), Member, 2014 - Present.
- Institute of Industrial and Systems Engineers (IISE), Member, 2017 - 2023.
- Society for Industrial and Applied Mathematics (SIAM), Member, 2015 - 2020.

Professional Service

- Reviewer: IISE Transaction, IEEE Transaction on Automation Science and Engineering, IEEE Transaction on Image Processing, MRS Communications, Environmetrics, Journal of Intelligent Manufacturing, Quality Engineering, Organic Process Research & Development, and AIChE Journal.
- Reviewer: INFORMS QSR Student Best Paper Competition, IISEC QCRE Best Student Paper Competition, IISEC DAIS Best Student Paper Competition.