

# Chuntian Wang

## Curriculum Vitae

Associate Professor  
Department of Mathematics  
The University of Alabama  
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🌐 <https://cwang.people.ua.edu/>

### Research Interests

#### Data Science

- Concept discovery approaches in medical image
- Dynamic topic modeling with tensor decomposition
- Supervision-aware dimensionality-reduction models for classification

#### Stochastic modeling, simulation, computation, and applied analysis

- Stochastic-statistical epidemics modeling of human behavior
- Stochastic-statistical modeling of criminal behavior

#### Nonlinear deterministic and stochastic partial differential equations

- Stochastic PDE with applications in complex fluids
- The deterministic and stochastic Zakharov-Kuznetsov equation
- Numerical analysis for stochastic geophysical fluid models

### Appointments

- 2024.4–present **Associate Professor**,  
*The University of Alabama*
- 2018.08–2024.4 **Assistant Professor**,  
*The University of Alabama*
- 2015–2018 **Hedrick Assistant Professor (Post-doc)**,  
*University of California, Los Angeles*  
*Mentor: Andrea L. Bertozzi*
- Fall 2015 **Postdoctoral Fellow**,  
*Mathematical Sciences Research Institute*  
*Mentor: Andrea Montanari*

### Education

- 2009–2015 **Ph.D., Pure Mathematics**,  
*Indiana University Bloomington, USA*  
*Thesis Advisors: Roger Temam & Nathan Glatt-Holtz*
- 2008–2009 **M.S., Applied Mathematics**,  
*Sichuan University, P. R. China*

2004–2008 **B.S., Applied Mathematics and Actuary,**  
*Sichuan University, P. R. China*

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### Journal articles published while at UA

- [6] Bongarti, M., Galvan, L. D., Hatcher, L., Lindstrom, M. R., Parkinson, C., Wang, C., Bertozzi, A. L. (2022). Alternative SIAR models for infectious diseases and applications in the study of non-compliance. *Mathematical Models and Methods in Applied Sciences*, **32**, no. 10, 1987-2015.
- [5] Cai, Y., Zhang, Y., Wang, C. (2022). A multiscale stochastic criminal behavior model and convergence to a Piecewise-deterministic-Markov-process limit. *Mathematical Models and Methods in Applied Sciences*, **32**, no. 4, 619-645.
- [4] Li, X., Wang, C., Li, H., Bertozzi, A. L. (2022). A martingale formulation for stochastic compartmental susceptible-infected-recovered (SIR) models to analyze finite size effects in COVID-19 case studies. *Networks and Heterogeneous Media*, **17**, no. 3, 311-331.
- [3] Peng, K., Lu, Z., Lin, V., Lindstrom, M. R., Parkinson, C., Wang, C., Bertozzi, A. L., Porter, M. A. (2021). A multilayer network model for co-evolution of epidemic and competing opinion spread. *Mathematical Models and Methods in Applied Sciences*, **31**, no. 12, 2455-2494.
- [2] Wang, C., Zhang, Y. (2021). A multiscale stochastic criminal behavior model under a hybrid scheme. *Electronic Research Archive*, **29**, no. 4, 2741-2753.
- [1] Wang, C., Zhang, Y., Bertozzi, A. L., Short, M. B. (2020). A stochastic-statistical residential burglary model with independent Poisson clocks. *European Journal of Applied Mathematics*, **32**, no. 1, 32-58.

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### Journal articles submitted while at UA

- [2] Du, H., Wang, C. Partial regularity for the three-dimensional stochastic Ericksen–Leslie equations. *Indiana University Mathematics Journal*. Submitted Feb. 2024.
- [1] Xiong, Y., Wang, C., Zhang, Y. Interacting particle models on the impact of spatially heterogeneous human behavioral factors on dynamics of infectious diseases. *PLOS Computational Biology*. Submitted Jan. 2024.

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### Manuscripts in preparation

- [1] Sun, Z., Wang, C., Qian, X. Human mobility model with segregation studies. *NA*.

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### Book chapters published while at UA

- [2] Ahn, M., Eikmeier, N., Haddock, J., Kassab, L., Kryshenko, A., Leonard, K., Needell, D., Madushani, R. W. M. A., Sizikova, E., Wang, C. (2021). On large-scale dynamic topic modeling with nonnegative CP tensor decomposition. In Demir, I., Lou, Y., Wang, X., Welker, K. (Eds.), *Advances in Data Science* (vol. 26, pp. 181-210). Springer, Cham..

- [1] Wang, C., Zhang, Y., Bertozzi, A. L., Short, M. B. (2019). A stochastic-statistical residential burglary model with finite size effects. In Bellomo, N., Degond, P., Tadmor, E. (Eds.), *Active Particles, Volume 2: Advances in Theory, Models, and Applications* (vol. 2, pp. 245-274). Birkhäuser, Cham..

## Conference abstracts & proceedings while at UA

- [2] Sizikova, E., Vendrow, J., Cao, X., Grotheer, R., Haddock, J., Kassab, L., Kryschenko, A., Merkh, T., Madushani, R. W. M. A., Moise, K., Ulichney, A., Vo, H. V., Wang, C., Coffee, M., Leonard, K., Needle, D. (in press). *Automatic infectious disease classification analysis with concept discovery*. Abstract.
- [1] Haddock, J., Kassab, L., Li, S., Kryshchenko, A., Grotheer, R., Sizikova, E., Wang, C., Merkh, T., Madushani, R. W. M. A., Ahn, M., Needell, D., Leonard, K. (2022). Semi-supervised nonnegative matrix factorization for document classification (pp. 1355-1360). Conference Proceeding .

## Publications before coming to UA

- [6] Pan, C., Li, B., Wang, C., Zhang, Y., Geldner, N., Wang, L., Bertozzi, A. L. (2018). Crime modeling with truncated Lévy flights for residential burglary models. *Mathematical Models and Methods in Applied Sciences*, **28**, no. 9, 1857-1880.
- [5] Glatt-Holtz, N., Temam, R., Wang, C. (2017). Time discrete approximation of weak solutions for stochastic equations of geophysical fluid dynamics and applications. *Chinese Annals of Mathematics, Series B*, **38**, no. 2, 425-472.
- [4] Glatt-Holtz, N., Temam, R., Wang, C. (2014). Martingale and pathwise solutions to the stochastic Zakharov-Kuznetsov equation with multiplicative noise . *Discrete Continuous Dynamical Systems, Series B*, **19**, no. 4, 1047-1085.
- [3] Wang, C. (2014). The existence of strong solutions to the 3D Zakharov-Kuznetsov equation in a bounded domain. *Discrete Continuous Dynamical Systems, Series A*, **34**, no. 11, 4897-4910.
- [2] Wang, C. (2014). Local existence of strong solutions to the 3D Zakharov-Kuznetsov equation in a bounded domain. *Applied Mathematics & Optimization*, **69**, no. 1, 1-19.
- [1] Saut, J., Wang, C., Temam, R. (2012). An initial and boundary-value problem for the Zakharov-Kuznetsov equation in a bounded domain. *Journal of Mathematics Physics*, **53**, no. 11, 29 pp.

## Teaching Experiences

### The University of Alabama

- Spring 2024 **Instructor**, *Math 355, Theory Of Probability*
- Spring 2024 **Instructor**, *Math 457/557, Stochastic Processes I*
- Fall 2023 **Instructor**, *Math 452/552, Math Stats W/Applictn II*
- Fall 2023 **Instructor**, *Math 457/557, Stochastic Processes I*
- Spring 2023 **Instructor**, *Math 355, Theory Of Probability*

Spring 2023 **Instructor**, *Math 457/557, Stochastic Processes I*  
 Fall 2022 **Instructor**, *Math 452/552, Math Stats W/Applictn II*  
 Fall 2022 **Instructor**, *Math 457/557, Stochastic Processes I*  
 Spring 2022 **Instructor**, *Math 355, Theory Of Probability*  
 Spring 2022 **Instructor**, *Math 457/557, Stochastic Processes I*  
 Fall 2021 **Instructor**, *Math 457/557, Stochastic Processes I*  
 Fall 2021 **Instructor**, *Math 554, Math Statistics I*  
 Fall 2020 **Instructor**, *Math 452, ath Stats W/Applictn II*  
 Fall 2020 **Instructor**, *Math 457/557, Stochastic Processes I*  
 Spring 2020 **Instructor**, *Math 355, Theory Of Probability*  
 Spring 2020 **Instructor**, *Math 355, Theory Of Probability*  
 Spring 2020 **Instructor**, *Math 457/557, Stochastic Processes I*  
 Fall 2019 **Instructor**, *Math 451/551, Math Stats W/Applictn I*  
 Fall 2019 **Instructor**, *Math 554, Math Statistics I*  
 Spring 2019 **Instructor**, *Math 355, Theory Of Probability*  
 Spring 2019 **Instructor**, *Math 451/551, Math Stats W/Applictn I*  
 Fall 2018 **Instructor**, *Math 451/551, Math Stats W/Applictn I*

## Invited Research Visits

- Vanderbilt University, Nashville, Tennessee, USA. Dec., 2022.
- Georgia Institute of Technology, Atlanta, Georgia, USA. Aug., 2019.
- University of California, Los Angeles, Los Angeles, California, USA. Aug., 2019.
- Indiana University Bloomington, Bloomington, Indiana, USA. June, 2019.

## Presentations

- *2024 Joint Mathematics Meetings (JMM 2024)*, Moscone North/South, Moscone Center, San Francisco, CA, United States, January 2024.
- *The Applied and Numerical PDE Seminar, Department of Mathematics, University of California, Berkeley*, online, November 2023.
- *Seminars on Analysis and Stochastic Analysis (SASA), Department of Mathematics and Statistics, Auburn University*, online, November 2023.
- *PDE Seminar Fall 2023*, Department of Mathematics, Vanderbilt University, Nashville, TN, United States, October 2023.
- *Probability Seminar*, Department of Mathematics, Louisiana State University, Baton Rouge, LA, United States, October 2023.
- *AMS Sectional meeting*, University of South Alabama, Mobile, AL, United States, October 2023.
- *The 13th AIMS Conference on Dynamical Systems, Differential Equations and Applications*, University of North Carolina Wilmington, Wilmington, NC, United States, June 2023.

- *AMS Sectional meeting*, Georgia Institute of Technology, Atlanta, GA, United States, March 2023.
- *AMS Sectional meeting*, University of Texas at El Paso, El Paso, TX, United States, September 2022.
- *Departmental Applied Math Colloquium at the Department of Mathematics and Statistics of University of Maryland Baltimore County (UMBC)*, online, April 2022.
- *AMS sectional meeting*, online, November 2021.
- *AMS sectional meeting*, online, November 2021.
- *R.F.B Seminar at Mathematics Department, Old Dominion University*, online, April 2021.
- *Mathematics Graduate Seminar at Mathematics Department of California State University of Channel Islands*, online, October 2020.
- *AMS Sectional meeting*, online, September 2020.
- *Math 285 J virtual class meeting offered by Department of Mathematics, University of California, Los Angeles*, online, May 2020.
- *Seminar*, UA Department of Information Systems, Statistics and Management Science, The University of Alabama, Tuscaloosa, AL, United States, February 2020.
- *AMS Sectional meeting*, University of Florida, Gainesville, FL, United States, November 2019.
- *AMS Sectional meeting*, University of Florida, Gainesville, FL, United States, November 2019.
- *Seminar*, UA Department of Criminology & Criminal Justice, The University of Alabama, Tuscaloosa, AL, United States, September 2019.
- *Applied and Computational Mathematics Seminar*, Georgia Institute of Technology, Atlanta, GA, United States, August 2019.
- *Scientific Computing and Applied Math Institute Seminar*, Indiana University Bloomington, Bloomington, IN, United States, June 2019.
- *AMS Sectional meeting*, Auburn University, Auburn, AL, United States, March 2019.
- *AMS Sectional meeting*, Auburn University, Auburn, AL, United States, March 2019.
- *Applied Math Colloquium*, University of California, Los Angeles, Los Angeles, CA, United States, March 2019.

## Awards and Honors

- Fall 2015 Postdoctoral Fellowship, Mathematical Sciences Research Institute.
- 2014 Travel Award, Heidelberg Laureate Forum Foundation.
- 2014 Joseph and Frances Morgan Swain Fellowship, Indiana University Bloomington.
- 2014 College of Arts and Sciences Travel Award, Indiana University Bloomington.
- 2014 Schober Travel Award, Indiana University Bloomington.
- 2013 Schober Travel Award, Indiana University Bloomington.

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## Service

- Referee for several mathematical journals.
- Organizer, Special session “Stochastic Modeling in Biological, Physical and Social Sciences: Theory and Applications”, The 13th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Wilmington, NC. (May 31, 2023 - June 4, 2023).
- Committee Member, MATHCOUNTS Tuscaloosa Chapter, Tuscaloosa, AL. (August 2021 - Present).
- Organizer, 2024 MATHCOUNTS West Alabama Regional Competition by MATHCOUNTS Tuscaloosa Chapter, Tuscaloosa, AL (August 2023 - February 2024).
- Organizer, 2023 MATHCOUNTS West Alabama Regional Competition by MATHCOUNTS Tuscaloosa Chapter, Tuscaloosa, AL (August 2022 - February 2023).
- Organizer, 2022 MATHCOUNTS West Alabama Regional Competition by MATHCOUNTS Tuscaloosa Chapter, Tuscaloosa, AL (August 2021 - February 2022).
- Presenter, The McCollough Institute for Pre-Medical Scholars (December 2021).
- Presenter, The McCollough Institute for Pre-Medical Scholars (November 2020).