Chuntian Wang

Curriculum Vitae

Assistant Professor
Department of Mathematics
The University of Alabama
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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

2024.08– **Associate Professor (Tenure-track appointment)**,
The University of Alabama

2018.08– **Assistant Professor (Tenure-track appointment)**,
2024.08 *The University of Alabama*

2015–2018 **Hedrick Assistant Professor (Post-doc)**,
University of California, Los Angele
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

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.*

Manuscripts in preparation

[2] Du, H.,Wang, C. Partial regularity of stochastic Ericksen-Leslie system. *Discrete and Continuous Dynamical Systems - A.*

[1] Zhang, Y., Xiong, Y.,Wang, C. On the impact of spatially heterogeneous human behavioral factors on 2d dynamics of infectious diseases. *Physics Review X.*

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 stochas- tic 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

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.

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, 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).