

# HUI YI, PH.D.

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## SUMMARY

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Hui Yi is a research statistician/data scientist at the University of Georgia School of Social Work. As a faculty member in tertiary education for nine years, she has taught six undergraduate/graduate courses in English and Mandarin, including two newly developed courses, while her research expertise includes machine learning methods, high-dimensional variable selection and feature extraction, Bayesian analysis, Markov chain Monte Carlo simulation algorithms, multivariate statistical analysis, survey design, and survey/observational research data analysis. In addition, her daily work includes writing large collaborative grants, designing and implementing complex analysis plans, producing technical reports, and meeting press release deadlines. Since 2020, Dr. Yi has been working on three human trafficking research projects with a total budget of over \$24 million. Most recently, as a co-investigator, she helped the team win a \$10 million human trafficking project from the U.S. Department of State for \$2.2 for Phase I and \$7.8 for Phase II, running from 2022 to 2028.

## AREAS OF SPECIALIZATION

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**Statistics:** Machine Learning, Feature Selection, Dimension Reduction, Bayesian Methods, Multivariate Analysis, Survey Design and Analysis, Structure Equation Models, Longitudinal Models.

**Application Areas:** Social Work, Sociology, Genetics, Bioinformatics, Transportation Engineering

## EDUCATION

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| 2009-2014 | Ph.D. | Statistics, Virginia Tech, Blacksburg, VA, United States (#73 in the QS USA rankings for 2021; GPA: 3.74/4) <ul style="list-style-type: none"><li>○ Dissertation Title: <i>Assessment of Sparse Regression Machine Learning Methods for Genome-Wide Association Studies.</i></li><li>○ Supervisor: Professor Ina Hoeschele</li></ul> |
| 2009-2011 | M.S.  | Statistics, Virginia Tech, Blacksburg, VA, United States (GPA: 3.94/4) <ul style="list-style-type: none"><li>○ Supervisor: Professor Ina Hoeschele</li></ul>   |

2005-2009 B.S. Mathematics, Beijing Normal University, Beijing, China (#12 in the QS Mainland China rankings for 2021; GPA: 83/100)

- Supervisor: Professor Dazhi Meng

## **PROFESSIONAL EMPLOYMENT**

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- 2020-present *Assistant Research Scientist/Data Scientist*, School of Social Work, University of Georgia, Athens, GA, United States (#48 nationally by the US News & World Report rankings)
- As a co-investigator, won a \$2.2 million (Phase I of the \$10 million) U.S. Department of State project with the team spanning from 2022-2028
  - Designed household surveys and Respondent Driven Sampling Survey; monitored data collection in collaboration with the African in-country partners in Sierra Leone, Guinea and Senegal; performed statistical modeling (social network methods, Bayesian methods, logistic regression, multivariate models, etc.); established robust baseline prevalence estimates of human trafficking in the selected hotspots in Sub-Saharan African countries, one of the main goals of the projects; assessed treatment effects based on longitudinal data collected in Ghana using a structural equation model; served on the Prevalence Reduction Innovation Forum (PRIF) conference committee.
  - Co-authored 7+ technical reports; first- and co-authored 7+ journal articles; gave 7 scholarly presentations in the international conferences; wrote 7 grant proposals to federal governments; supervised 3 Ph.D. students; led future leaders program seminar; served on the Ph.D. committee, etc.
- 2019-2020 *Visiting Research Scholar*, Department of Statistics, Virginia Tech, Blacksburg, VA, United States (#73 in the QS USA rankings for 2021)
- Developed hidden Markov model for reliability analysis of high dimensional travel time series data; derived model assessment, confidence interval and prediction; conducted simulation and real data analysis; and supported journal article.
- 2015-2019 *Assistant Professor (Tenured)*, School of Highway, Chang'an University, Xi'an, Shaanxi, China (#105 nationally by US News & World Report rankings for 2021)
- Developed two new courses, one for undergraduate and one for graduate; taught six graduate and undergraduate courses and received excellent feedback from students and faculty teaching evaluation committee.
  - Undertook three undergraduate teaching projects to innovate effectiveness of lecturing, including online delivery, seminar and group learning design, use of multi-media, etc.
  - Served as Principal Investigator for three research projects on applying data mining and statistical methods to optimizing transportation infrastructure management.
  - Performed university services in multiple committees and panels (e.g., Undergraduate Recruitment Committee, Graduate Recruitment Committee; Talented Faculty Recruitment Committee; University's Strategic Planning

## OTHER EMPLOYMENT

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- 2015-2019      *Graduate Research Assistant*, Department of Statistics, and Genetics, Bioinformatics and Computational Biology (GBCB) Program, Virginia Tech, Blacksburg, VA, United States. Supervisor: Professor Ina Hoeschele
- Analyzed the Health Aging and Body Composition (Health ABC) data which included 786 Health ABC Caucasians who had both Genome-wide Association Studies (GWAS) and serum IL-6 SR measurements. The genotype data included 750,424 Single Nucleotide Polymorphisms (SNPs) from Chromosomes 1, 3, 4, 6, and 19. Covariates included age, gender, site of data collection, and one principal component scores using the R programming software.
  - Thoroughly investigated the existent sparse regression machine learning methods for high dimensional Genome-Wide Association Study; devised an analytic and a nonparametric False Discovery Rate control approach for all the methods; implemented and validated on realistically simulated data and Health ABC data.
  - Proposed Bayesian False Discovery Rate criterion, a variable selection strategy for Bayesian shrinkage methods; devised Bayesian mixed prior models; derived and implemented variational Bayes algorithms; evaluated their performances on the GWAS data.
  - Performed topology-based weighted gene co-expression network analysis for Multi-Ethnic Study of Atherosclerosis (MESA) data; conducted pathway analysis using GO, KEGG, and PFAM databases for the modules; visualized the gene network structures using Cytoscape software.

## PUBLICATIONS

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### **In-Process Journal Articles**

- Datta, G., Okech, D., **Yi, H.**, Clay-Warner, J., Li, J. Small Area Estimation of the Prevalence of Child Trafficking in Sierra Leone. *Journal of Quantitative Criminology*. (To submit)
- Clay-Warner J., **Yi, H.**, Okech D., Li, J., Wang, T. Topcoding Guidance for Social Network and Network Scale-Up Studies. (In progress)
- **Yi, H.**, Vincent, K., Clay-Warner J., Cody, A., Okech, D. Applying Machine Learning methods to Deciphering and Differentiating Child Trafficking Experiences and Nuances. (In progress)
- Kawashima, T., Clay-Warner, J., **Yi, H.**, Li, J., Okech, D. The Protective Effect of Parents' Network-based Social Capital on Child Labor Exploitation in Guinea. (In progress)
- Okech D., **Yi H.**, Callands T.A., Cody A. Quantitative Analysis of the Intervention Experiences of Human Trafficking Survivors and At-risk Women in Ghana. (In progress)

## **Journal Articles**

- Vincent, K., **Yi, H.**, Okech, D., Clay-Warner, J., Dioh, F. (2023). A Novel Application of a Respondent-Driven Sampling Estimation Methodology to Study a Sex-Trafficked Population in Senegal in the Kédougou Region. *Journal of Quantitative Criminology*. (Impact Factor: 5.077; under review)
- Schroeder, **Yi H.**, E., Okech D., Aletraris, L., Bolton, C. (2023). Do Social Service Interventions for Human Trafficking Survivors Really Work? A Systematic Review and Meta-Analysis. *Trauma, Violence, & Abuse*. (Impact Factor: 8.294; under review)
- Cody A, Okech D, **Yi H.**, Aletraris L, Clay-Warner J, Callands, T. (2023). When child trafficking and Informal fostering intersect: A mixed methods study. [Africa Child Welfare Issue]. *Social Work & Social Sciences Review*. (Impact Factor: 0.35; accepted)
- **Yi, H.**, Vincent, K., Okech, D., Clay-Warner, J., Li, J., Kawashima, T., ... & Hassan Konteh, F. (2023). An Empirical Comparison of a Traditional Strategy and Network Scale-Up Method for Prevalence Estimation of Child Trafficking in Sierra Leone. *Crime & Delinquency*, 00111287231170122. (Impact Factor: 2.851)
- Li, D., Ranjitkar, P., Zhao Y., **Yi H.**, & Rashidi S. (2017). Analyzing pedestrian crash injury severity under different weather conditions. *Traffic Injury Prevention*, 18(4), 427-430. (Impact Factor: 1.413)
- **Yi, H.**, Breheny, P., Imam, N., Liu, Y., & Hoeschele, I. (2015). Penalized multimarker vs. single-marker regression methods for genome-wide association studies of quantitative traits. *Genetics*, 199(1), 205-222. (Impact Factor: 4.402)
- Wang, Q., **Yi, H.**, Liu, L., Meng, D. (2008). Progress in Gene Logic Networks (in Chinese). *Progress of Biochemistry and Biophysics*, 35(11), 1239-1246. <http://www.pibb.ac.cn/pibbcn/article/abstract/20080155> (Impact Factor: 0.351)
- Guo, C., Xu, L., Yang, S., **Yi, H.** (2008). Analysis and Research on the Extreme of Multivariable Functions. *Sciencepaper Online*, China, 2(1). ISSN: 1673-7180. (Impact Factor: 0.869)

## **Book Chapters**

- **Yi, H.** and Liu, N. (2018). *Chapter 5. Writing for Project Management*. In Yang, G. and Li, C. (Eds). *Applied English Writing in Civil Engineering (English)*. People's Communications Publishing House. ISBN: 9787114147395. (Top 5 Publisher in China)

## **Conference Proceedings**

- Guan, J., **Yi, H.**, Zhang, Q., Zhang, Z. (2019). A Spatial-temporal Optimization Model for Road Network Maintenance and Rehabilitation Decision-making. *The Proceedings of the 20<sup>th</sup> COTA International Conference of Transportation Professionals (CICTP2020)*. (Impact Factor: 0.14)

# PRESENTATIONS

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- **Yi, H.**, Vincent, K., Okech, D., Clay-Warner, J. (2024, January 10-14). *Detecting Cluster Patterns of Child Trafficking and Child Labor and Their Risk Factors Using Cluster Regression and Machine Learning Methods*. [Conference Workshop]. Society for Social Work and Research. Washington D.C., United States. (under review)
  - Vincent, K., **Yi, H.**, Okech, D., Clay-Warner, J. (2024, January 10-14). *An Application of Respondent-Driven Sampling to Study a Sex-Trafficked Population in Senegal: Lessons Learned in the Field*. [Conference Workshop]. Society for Social Work and Research. Washington D.C., United States. (under review)
  - Datta, G., Okech, D., **Yi, H.**, Clay-Warner, J., Konteh, F., Li, J. (2024, January 10-14) *An Application of Small Area Estimation Methods in Prevalence Estimation of Child Trafficking*. [Conference Workshop]. Society for Social Work and Research. Washington D.C., United States. (under review)
  - Okech, D., **Yi, H.**, Aletraris, L., Clay-Warner, J. (2023, November 12-15). *Vulnerability of Children with Disabilities in Trafficking: A Low-Resourced Country Study*. [Conference Presentation]. American Public Health Association, Atlanta, GA, United States. (Accepted)
  - Datta, S.G., Li, J., **Yi, H.**, Clay-Warner, J., Okech D. (2023, August 7-11). *Small Area Prevalence Estimation of Child Trafficking at Lower Administrative Levels of a Country*. [Conference Presentation]. Joint Statistical Meetings, Toronto, Ontario, Canada. (Accepted but not presented due to schedule conflict)
  - **Yi, H.**, Li, J., Wang, T. (2023, February 24). *Network Scale-up Method: Challenges in Low-Resource Contexts*. [Seminar Presentation]. Future Leaders Program. Center on Human Trafficking Research & Outreach (CenHTRO), School of Social Work, University of Georgia, Athens, GA, United States.
  - **Yi, H.** (2023, January 17). *Hidden in plain sight: estimating child labor trafficking in Guinea*. [Colloquia Presentation]. School of Social Work Colloquia, University of Georgia, Athens, GA, United States.
  - Okech, D., **Yi, H.**, Clay-Warner, J., and Aletraris, L. (2023, January 14). *Prevalence estimation for hard-to-reach populations: Using the Network Scale-up Method for estimating child trafficking prevalence in a low-resourced country*. [Conference Workshop]. Society for Social Work and Research. Phoenix, Arizona, United States.
  - **Yi, H.**, Vincent, K., Okech, D., Clay-Warner, J., Li, J., Kawashima, T., Edgemon, T. (2022, August 6). *Comparison of Direct Estimation and Network Scale-Up Method for Prevalence Estimation of Child Trafficking in Sierra Leone*. [Conference Presentation]. Joint Statistical Meetings, Washington D.C., United States.
  - Kawashima, T., Clay-Warner, J., **Yi, H.**, Li, J., Okech, D. (2022, May 27). *The Protective Effect of Parents' Network-based Social Capital on Child Labor Exploitation in Guinea*. [Conference Presentation]. American Sociological Association Annual Meeting. Los Angeles,



## EXTERNAL FUNDING-AWARDED

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- 2024-2028     **Co-Principal Investigator**, Principal Investigator: Okech D. and Altraris L.  
*Reducing the prevalence of human trafficking through increasing the financial literacy and capability of survivors and those at-risk in Sub-Saharan Africa.* US Department of State, Office to Monitor and Combat Trafficking in Persons, Grant # SSJTIP22CA0029 [Phase 2 of the project] \$7,800,000
- 2022-2024     **Co-Investigator**, PI: Okech D and Altraris L. *Reducing the prevalence of human trafficking through increasing the financial literacy and capability of survivors and those at-risk in Sub-Saharan Africa.* US Department of State, Office to Monitor and Combat Trafficking in Persons, Grant # SSJTIP22CA0029 [Phase 1 of the project] \$2,200,065
- 2019-2025     **Quantitative Research Scientist**, with David Okech (PI), Jody Clay-Warner (co-PI), Alex Balch (co-PI, University of Liverpool), Lydia Aletraris (co-I), and Tamora Callands (co-I). *Measuring the Prevalence of Trafficking around the World: Implications for Research, Programming, and Policy*, U.S. Department of State, Office to Monitor and Combat Trafficking in Persons, Grant # SSJTIP19CA0032 \$15,750,000 (awarded in 2019) + \$4,000,000 (awarded in 2020)
- 2018-2023     **Quantitative Research Scientist**, with David Okech (PI), Jody Clay-Warner (co-PI), Alex Balch (co-PI, University of Liverpool), Tamora Callands (co-I) and Nate Hansen (co-I). U.S. Department of State, Office to Monitor and Combat Trafficking in Persons, Grant # SSJTIP18CA0015. \$4,000,000
- 2019-2022     **Co-Investigator**, PI: Zhang Q et al. *Wring for the National Standard of Highway Construction Project Management.* Transportation construction group corporation of Shaanxi Province and Chang'an University, Ministry of Transport, China. \$140,000
- 2016-2018     **Principal Investigator.** *Deep Correlation and Information Mining of Massive Multi-source Road Performance Data.* Department of Science and Technology of Shaanxi Province, China. \$5,000
- 2017-2018     **Principal Investigator.** *Study on Estimation Methods of Missing Data in Road Performance Monitoring.* Key laboratory project of Hebei province of Shijiazhuang Tiedao University and Chang'an University, China. \$3,000
- 2015-2017     **Principal Investigator.** *Dynamic Reliability Assessment of Road Infrastructure using a Bayesian Time-spatial Method.* Basic scientific research of central universities, Ministry of Education of China. \$7,500

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## SUBMITTED GRANTS-UNAWARDED OR PENDING

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- 2022 **Co-Investigator**. With Nate Hansen (PI), Tamora Callands (co-I), Lydia Aletraris (co-I), David Okech (co-I), Anna Cody (co-I). *One Health Approach to Reducing Trafficking in Liberia*. U.S. Department of State, Office to Monitor and Combat Trafficking in Persons. (Un-awarded) \$5,497,000
- 2022 **Co-Investigator**. With Tamora Callands (PI), Jody Clay-Warner (co-I), Nathan Hansen (co-I), Anna Cody (co-I). *Assessing the Needs and Services among Migrant Workers in Georgia: Implications for Policy and Practice*. National Institute of Justice. (Un-awarded) \$1,374,917
- 2022 **Co-Investigator**. With David Okech (PI), Lydia Aletraris (co-PI), Anna Cody (co-I). *2023 Child Protection Compact (CPC) Partnership Prevalence Study. A novel estimate of child trafficking in Côte d'Ivoire*. U.S. Department of State, Office to Monitor and Combat Trafficking in Persons. (Un-awarded) \$9,000,000
- 2022 **Co-Investigator**. With David Okech (PI), Lydia Aletraris (co-PI), Anna Cody (co-I). *Implementation Research on Child Trafficking in Benin*. U.S. Department of State, Office to Monitor and Combat Trafficking in Persons. (Un-awarded) \$10,000,000
- 2022 **Co-Investigator**. With David Okech (PI), Lydia Aletraris (co-PI), Laura Zimmerman (co-PI). *Senegal Talibés Outcomes & Priorities (STOP) Project*. U.S. Department of State, Office to Monitor and Combat Trafficking in Persons. (Pending) \$5,000,000

## HONORS, AWARDS, AND RECOGNITIONS

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| 2019-2020 | Full Scholarship Fellowship (\$25,000), Genetics, Bioinformatics, and Computational Biology (GBCB) Program, Virginia Tech, Blacksburg, VA, US.  |
| 2017      | Excellent Supervisor Award. Ji, Q. et al. (2017). <i>Sponge city with starlight road: high brightness asphalt concrete pavement based on waste glass recycling</i> , 2nd Prize of the 11th Challenge Cup College Students Science and Technology Work Competition of Shaanxi Province, China. |
| 2007      | Championship, Role: Group Leader. China Undergraduate Mathematical Contest in Modeling. Beijing, China.   |
| 2005-2009 | Outstanding Undergraduate Research, Outstanding Contest Group, Excellent Summer Internship Group; and Honor Bachelor's Degree. Beijing Normal University, Beijing, China.   |

## TEACHING EXPERIENCE

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2015-2019 Chang'an University, Xi'an, Shaanxi, China

**Graduate Courses**

- Advanced Statistical Analysis (newly created, taught in English for 4 times)
- Mathematical Statistics (in Chinese, 6 times)
- Numerical Analysis (in Chinese, 1 time)

**Undergraduate Courses**

- Technical Writing for International Civil Engineering Applications in English, I & II (in English, 4 times)
- Engineering Drawing (in Chinese, 1 time)
- Advanced Oral English (in English, 1 time)
- Seminar on International Transportation Engineering Projects: Construction, Operation, Maintenance, and Management (newly developed, invited experts with international projects experiences for speech and lecture; 3 times)

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**STUDENT ADVISING AND MENTORING ACTIVITIES**

2023-2024	Data Analyst (staff in hiring), Center on Human Trafficking Research & Outreach, School of Social Work, University of Georgia, U.S.
2023-2024	Fahmida Afroz, Ph.D. student, School of Social Work, University of Georgia, U.S.
2021-2023	Jiacheng Li, Ph.D. candidate, Department of Statistics, University of Georgia, U.S.
2022-2023	Tao Wang, Ph.D. student, Department of Statistics, University of Georgia, U.S.
2021-2022	Hongju Park, Ph.D. student, Department of Statistics, University of Georgia, U.S.
2018-2019	Jinchao Guan, Ph.D. student, School of Highway, Chang'an University, China
2017-2018	Enze Liu, M.E. student, School of Highway, Chang'an University, China

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**PROFESSIONAL SERVICE**

Ad-Hoc Manuscript Reviewer for:

*Journal of Human Trafficking* (IF: 2.05), *Oxford University Press* (IF: 2.159), *Cities* (IF: 6.077), *International Statistical Review* (IF: 1.946), *Sankhya B* (IF: 0.892), *Transportmetrica A: Transport Science* (IF: 3.277), *Journal of Human Trafficking* (IF: 1.36).

- 2020-present    Affiliated Faculty Member, Owens Institute of Behavioral Research (OIBR),  
University of Georgia, Athens, GA, United States
- 2020-present    Center on Human Trafficking Research & Outreach, School of Social Work,  
University of Georgia, Athens, GA, United States
  - PRIF Conference Committee
  - Staff Search Committee
- 2017-2019      Word Transportation Convention (WTC) Annual Meetings, Beijing, China
  - Technical Committee
- 2015-2019      School of Chang'an University, Xi'an, Shaanxi, China
  - Undergraduate Recruitment Committee
  - Professional Master's Program Committee
  - PhD Program Committee
  - International Talents Hiring Committee
  - Office of Institutional Research, Program Review and Assessment Committee
  - Undergraduate Colloquium Committee
  - Office of Provost, Task Force on Academic Excellence

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## PROFESSIONAL AFFILIATIONS

- 2022-present    Georgia Statewide Human Trafficking Task Force
- 2020-present    American Statistical Association
  - Sections: Statistical Computing
  - Statistical Learning and Data Science
  - Survey Research Methods
  - Social Statistics
  - Statistics in Epidemiology
  - Statistics in Genomics and Genetics
- 2020-present    Society for Social Work and Research
  - Sections: Violence against Women and Children
  - Research Design and Measurement
  - International Social Work & Global Issues
  - Communities and Neighborhoods

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## MEDIA MENTIONS

Gallant, A. (October 7, 2022). UGA receives \$2.2M to study labor trafficking. *UGATODAY*.  
<https://news.uga.edu/uga-receives-2-2m-to-study-labor-trafficking/>

