Unkyung Lee

✆ +1 (979) 229 7146
✉ uklee1029@gmail.com
🖥 https://unkyunglee.github.io

Research Interests

Immuno-oncology Trial Design, Sample Size and Power Calculation, Longitudinal Data Analysis, Competing Risks Data Analysis, Missing Data Analysis, Survival Analysis, Application to Neurodegenerative Diseases and Animal Science.

Employment

2020 – Present
Post Doctoral Research Fellow, *Oak Ridge Institute for Science and Education Program, U.S. Food and Drug Administration*, Silver Spring, MD.
Mentor: Dr. Zhenzhen Xu

2017 – 2020
Post Doctoral Research Associate, *Biostatistics, Bioinformatics, Nutrition and Cancer Research Training Program (NIH T32), Texas A&M University*, College Station, TX.
Mentors: Professors. Raymond J. Carroll, Tanya P. Garcia, and Guoyao Wu

2016 – 2017
Adjunct Lecturer, *Sam Houston State University*, Huntsville, TX.

Education

2016
PhD,Applied Mathematics, *University of North Carolina*, Charlotte, NC.
Advisor: Prof. Yanqing Sun, Dissertation: Analysis of Semiparametric Regression Models For the Cumulative Incidence Functions Under the Two-Phase Sampling Designs.

2011
MS, Mathematics, *Ewha Womans University*, Seoul, Korea.
Advisor: Prof. Sunyoung Kim, Thesis: Solving a Nonconvex Quadratic Optimization problem by Splitting Coefficient Matrices of Its Constraints and Numerical Experiments.

2007
BS, Mathematics, *Ewha Womans University*, Seoul, Korea.

Publications

Manuscript in Preparation

1. **Lee, U.**, Xu, Z. (2022+). Design for immuno-oncology clinical trial with a heterogeneous patient population.

2. **Lee, U.** and Garcia, T.P. (2020+). JPRAT: an R package for the Joint Progression of Risk Assessment Tool, which evaluates and compares all outcomes simultaneously across multiple studies and adjusts for outcome dependencies. The description for the detailed estimation procedure is in the following paper: Garcia, T. P., Marder, K., and Wang, Y. (2017). Time-varying proportional odds model for mega-analysis of clustered event times, Biostatistics, 20(1), 129-146.

Peer-reviewed Papers

3. Sun, Y., Heng, F., **Lee, U.** and Gilbert, P.B. (2022). Estimation of Estimation of Cumulative Incidence Functions under Generalized Semiparametric Regression Models with Missing Covariates and Applications to Vaccine-Induced Antibodies as Correlates of HIV-1 infections . *To appear in The Canadian Journal of Statistics*.

4. **Lee, U.**, Carroll, R.J., Marder, K., Wang, Y. and Garcia, T.P. (2020). Estimating disease onset from change points of markers measured with error. *Biostatistics*, 0, 1-17, doi:10.1093/biostatistics/kxz068.

5. **Lee, U.**, Garcia, T.P., Carroll, R.J., Gilbreth, K.R., Wu, G. (2019). Analysis of repeated measures data in nutrition research. *Frontiers In Bioscience*, Landmark, 24, 1378-1390.

6. **Lee, U.**, Sun, Y., Scheike, T.H., Gilbert, P.B. (2018). Analysis of generalized semiparametric regression models for cumulative incidence functions with missing covariates. *Computational Statistics and Data Analysis*, 122, 59-79.

▬▬▬ Research Experience

2020 - Present **Post Doctoral Research Fellow**, *U.S. Food and Drug Administration*.
Mentor: Dr. Zhenzhen Xu

1. Develop an immuno-oncology study design with a heterogeneous patient population in order to improve study efficiency and provide responder specific treatment effects.
   - Develop a treatment effect estimation procedure adopting EM algorithm
   - Develop parametric and nonparametric testing procedures
   - Develop a sample size and power calculation by adopting bisection algorithm
2. Develop R package using R and Rcpp for implementation.

2017 - 2020 **Post Doctoral Research Associate**, *Biostatistics, Bioinformatics, Nutrition and Cancer Research Training Program (NIH T32)*, Texas A&M University.
Mentors: Professors. Raymond J. Carroll, Tanya P. Garcia

1. Propose a location-shift marker model under the shape constraints to estimate individual longitudinal trajectories and their inflection points as a new measure of disease onset.
2. Compare three different methods for determining the expected number of individuals who will have Huntington disease onset in the next 10 years with developing an R shiny software.
3. Work as a statistical consultant at Prof. Guoyao Wu's lab in the Department of Animal Science, Texas A&M University.
   - Analyze factor effects on mean concentrations of amino acids of chickens to understand if heat stress is associated with chicken growth over time.
   - Provide a tutorial report about how to capture biological variations among steers over time when the concentrations of amino acids are repeatedly measured at each time point.

Fall 2015, **Research Assistant**, University of North Carolina at Charlotte.
Summer 2014 *Advisor: Prof. Yanqing Sun*
1. Develop estimating equations for the semiparametric regression model for cumulative incidence function based on competing risks data under the case-cohort/two phase sampling design.
   ○ Adopt inverse probability weighted of complete case
   ○ Adopt an augmented inverse probability weighted of complete case method to improve efficiency of the inverse probability weighted of complete case (IPW) estimators.
2. Propose a local test for cox regression model and analyze its goodness of fit statistic with data application.

Contributed Talks

Oct 2022 **U.S. Food and Drug Administration, Center for Biologic Evaluation and Research, Division of Biostatistics**, Virtual Division of Biostatistics Seminar.

March 2019 **2019 Eastern North American Region (ENAR) Annual Meeting**, Philadelphia, PA.

July 2018 **The 20th Meeting of New Researchers in Statistics and Probability**, Simon Fraser University, Burnaby, Canada

Contributed Poster Presentations

Aug 2020 **Joint Statistical Meetings**, Virtual Conference.

April 2019 **Southeast Texas Chapter of the American Statistical Association Poster Session**, Texas A&M University, College Station, TX.

Sept 2018 **Statistical Bioinformatics and Cancer Symposium**, Institute for Applied Mathematics and Computational Science, Texas A&M University, College Station, TX.

Sept 2018 **The 3rd Annual Postdoctoral Research Symposium**, Texas A&M University, College Station, TX.

July 2018 **The 20th Meeting of New Researchers in Statistics and Probability**, Simon Fraser University, Burnaby, Canada.

May 2018 **The 6th Workshop on Biostatistics and Bioinformatics**, Georgia State University, Atlanta, GA. Received Travel Award for Young and Minority Researchers.

Teaching Experience

2016-2020 **Instructor**, *Department of Statistics*, Texas A&M University.
   ○ Summer 2020: STAT 642 Method of Statistics II
      - Graduate Course on Design and Analysis of Experiment
   ○ Fall 2019: STAT 302 Statistical Methods
      - Introductory of Statistics

Fall 2016 **Instuctor**, *Department of Mathematics and Statistics*, Sam Houston State University.
   ○ Fall 2016: MATH 1314 Pre-Calculus Algebra
   ○ Fall 2016: STAT 3379 Statistical Methods in Practice with SPSS

2013–2016 **Instructor**, *Department of Mathematics*, The University of North Carolina at Charlotte.
- Spring 2016: STAT 1221 Elements of Statistics I
  - Introductory of Statistics
- Summer 2015: STAT 2122 Introduction to Probability and Statistics
  - Introductory of Statistics, required calculus prerequisite
- Spring 2014: STAT 1222 Introductory Statistics
- Fall 2013: MATH 0900 Math Study Skills & Algebra Review

2011-2013 **Teaching Assistant**, *Department of Mathematics and Statistics*, The University of North Carolina at Charlotte.
- Tutor at Math Learning Center
  - Spring 2013: Introductory to Statistics
  - Spring 2012: Matrices and Linear Algebra
  - Fall 2011: Calculus IV

2008-2010 **Teaching Assistant**, Ewha Womans University, Seoul, Korea.
- Solving examples and exercises
  - Fall 2010: Advanced Calculus I
  - Spring 2009: Numerical Differential Equation
  - Spring, Fall 2008 : Calculus, Linear Algebra I, II

Honors and Awards

2019 **Participant in Junior Biostatisticians in Health Research Workshop**, *Invited to workshop which promotes interaction and networking among junior researchers in Biostatistics*, Eastern North American Region International (ENAR) Biometric Society, Philadelphia, PA, March, 2019.

2018 **Participant in 20th Meeting of New Researchers in Statistics and Probability**, *Travel award to attend workshop which promotes interaction and networking among new researchers in statistics and probability*, Simon Fraser University, Burnaby, Canada, July, 2018.

2018 **Participant in 6th Workshop on Biostatistics and Bioinformatics**, *Travel Award for Young and Minority Researchers*, Georgia State University, Atlanta, GA, May, 2018.

2015 **Graduate Teaching Award**, *In recognition of excellent undergraduate teaching in the Department of Mathematics and Statistics during the 2014-2015 academic year*, University of North Carolina at Charlotte, NC, 2015.

2011-2016 **Graduate Assistantship**, University of North Carolina at Charlotte.

2008-2010 **Brain Korea 21 Fellowship**, National Research Foundation, Korea.

2008-2010 **Graduate Teaching Assistantship**, Ewha Womans University.

Professional Activities

2018 **Served as Session Chair**, *The 20th Meeting of New Researchers in Statistics and Probability*, Simon Fraser University, Burnaby, Canada, July, 2018.

2019 **Attended Workshops**, *P.O.W.E.R Academic Writing Workshop*, Texas A&M University, College Station, TX, June, 2019.

2018 **Attended Workshops**, *International Symposium on Nutrition & Human Health*, Tohoku University (Sendia, Japan) and Texas A&M University, College Station, TX, November, 2018.

2018 **Attended NISS Writing Workshop for Junior Researchers**, *at Joint Statistical Meetings, Vancouver, Canada*, July, 2018.

2018 **Attended Workshops**, *Jump-Start Your Writing Productivity*, Texas A&M University, College Station, TX, Jan, 2018.

▬▬▬▬ Volunteers Work

March 2019 **Judge**, *The Student Research Week*, The Student Research Week (SRW) is the largest student run research symposium in the nation. This is four day competition highlights student research occurring on the Texas A&M campus. Volunteering as a judge for the PhD students' oral presentation session in public health research work, November 2021.

2012 - 2016 **Staff Organizer**, National Math and Science Competition, The Korean-American Scientists & Engineers Association (KSEA) offers the National Mathematics and Science Competition to challenge and inspire students. Working as a staff organizer at Charlotte, NC Chapter in April, every year.

March 2013 **Volunteer**, Julia Robinson Mathematics and Computing Festival, Volunteering as a activity leader for Grade 6, helping middle school students with math activities to learn and explore diverse subjects in mathematics.

▬▬▬▬ Computer software

○ Windows, Linux, MS office, LaTeX

▬▬▬▬ Programming Languages

○ Proficiency: R, Rcpp, MATLAB
○ Basic : SAS, C, SPSS

▬▬▬▬ Languages

○ English, Korean

References

Zhenzhen Xu
- Senior Mathematical Statistician
- Division of Biostatistics
- Office of Biostatistics and Epidemiology Evaluation
- Center for Biologic Evaluation and Research
- U.S. Food and Drug Administration
- E-mail: zhenzhen.xu@fda.hhs.gov

Tanya P. Garcia
- Associate Professor
- Department of Biostatistics
- University of North Carolina, Chapel Hill
- E-mail: tpgarcia@email.unc.edu

Raymond J. Carroll
- Distinguished Professor
- Professor of Statistics, Nutrition and Toxicology
- Department of Statistics
- Texas A&M University
- Director, Bioinformatics Training Program
- E-mail:carroll@stat.tamu.edu

Yanqing Sun
- Professor of Statistics
- Department of Mathematics and Statistics
- University of North Carolina, Charlotte
- E-mail: yasun@uncc.edu