# THELGE BUDDIKA PEIRIS

# ASSISTANT TEACHING PROFESSOR

**DEPARTMENT OF MATHEMATICAL SCIENCES, WPI**

1. **Education**

**Post-Doctoral Scholar** (August 2014 – August 2016)

Worcester Polytechnic Institute, Worcester, MA.

Research Advisor: Prof. Balgorbin Nandram.

**PhD (**August 2014)

Field of Study: Mathematical Statistics.

Southern Illinois University, Carbondale, USA.

Dissertation: Order Restricted Inference in Regression.

Research Advisor: Prof. Bhaskar Bhattacharya.

**M.S** (August 2010)

Field of Study: Mathematical Statistics.

Southern Illinois University, Carbondale, USA

Thesis: Order Restricted Inferences and Meta-Analysis in Linear Regression.

Research Advisor: Prof. Bhaskar Bhattacharya

**B.S** (May 2005)

Major: Mathematics.

Minor: Statistics.

University of Sri Jayewardenepura, Sri Lanka.

### Teaching Experience

### Worcester Polytechnic Institute Worcester, MA (August 2014 – Present)

### Assistant Teaching Professor of Department of Mathematics (August 2016 - Present)

Post-Doctoral Scholar  (August 2014 – August 2016)

Undergraduate courses:

MA 1021 Calculus I

MA 2611 Applied Statistics I

MA 2612 Applied Statistics II

MA 2621 Probability

MA 2201 Discrete Mathematics

MA 2631 Mathematical Statistics

Graduate courses:

MA 540 Mathematical Statistics and Probability I

MA 542 Regression Analysis

MA 546 Design and Analysis of Experiments

MA 547 Design and Analysis of Observational Studies and Sampling

MA 549 Analysis of Lifetime Data

MA 559 Statistics Graduate Seminar

### Southern Illinois University Carbondale, IL (August 2008 - August 2014)

Graduate Teaching Assistant

Intermediate Algebra

College Algebra

Business Calculus

Trigonometry

Finite Mathematics

**University of Sri Jayewardenepura** Nugegoda, Sri Lanka, (May 2005 - August 2008) Graduate Teaching Assistant at Mathematics Department (May 2005 - May 2007)

Graduate Teaching Assistant at Statistics Department (May 2007 - August 2008)

Recitation Classes for Mathematics majors

Calculus

Linear Algebra

Abstract Algebra

Classical Mechanics

Optimization

Introduction to Computer Science and Mathematical Software

Basic Mathematics for non-math majors.

1. **Teaching Innovations at WPI**

**Prepared Class Notes**

I used smartboard software to write the class notes from 2014 to 2016 and then switched to PDF Annotator from 2016. In both cases, I used a prepared document for each class which has basic definitions and examples typed in. The prcis acts as a road map for my class lecture. I then used the class sympodium to develop my notes at a pace where students can follow and interact with me, as well as provide feedback. For my undergraduate courses, prior to each class, I post a blank worksheet which has the same materials as the class notes. They can open this on a computer platform (such as an iPad) or bring a printout of it to fill blanks for a very organized class note.

**Conferences and Labs**

I introduced a help session for MA 3631: Mathematical Statistics. This course is the theoretical statistics course for undergraduates and the majority of the students are non-math majors. Help sessions really help them understand the concepts. I led the help session in 2017 and had a TA offer assistance after 2017. I also created a set of problems sheets to discuss in the conferences for MA 2621 Probability for Applications. For the undergraduate Statistics courses with labs (MA 2611 and MA 2612) and for some graduate classes (MA 542, MA 546, MA 547, MA 549), a set of R handout were created.

**Online Classes**

I began teaching online classes in 2015 and used Echo360 for capturing. This continues today and I regularly teach one or two online classes in each summer. I taught half of the MA 546 class in Spring 2020 and used Canvas Studio to record the lectures. Office hours are offered using Zoom and PDF Annotator to interactively write notes connecting with students from their remote environments.

1. **Courses taught at WPI**

|  |  |  |
| --- | --- | --- |
| Term | Title | Enrolment |
| 19-20 |  |  |
| Fall | MA 3631/MA 540 Mathematical Statistics and Probability | 22 |
|  | MA 559 Statistics Graduate Seminar | 19 |
| A term | MA 2621 Probability for Applications | 178 |
| Spring | MA 546 Design and Analysis of Experiments | 21 |
|  | MA 559 Statistics Graduate Seminar | 17 |
| C term | MA 2621 Probability for Applications | 45 |
| E1 term | MA 2621 Probability for Applications | 45 |
| E2 term | MA 2612 Applied Statistics II | 10 |
|  |  |  |
| 18-19 |  |  |
| Fall | MA 549 Analysis of Lifetime Data | 6 |
|  | MA 559 Statistics Graduate Seminar | 12 |
| A term | MA 2621 Probability for Applications | 162 |
| B term | MA 2631 Mathematical Statistics | 27 |
| Spring | MA 547 Design and Analysis of Observational Studies | 12 |
|  | MA 559 Statistics Graduate Seminar | 7 |
| C term | MA 2621 Probability for Applications | 335 |
| E1 term | MA 2621 Probability for Applications | 31 |
|  |  |  |
| 17-18 |  |  |
| Fall | MA 542 Regression Analysis | 10 |
|  | MA 559 Statistics Graduate Seminar | 23 |
| A term | MA 2621 Probability for Applications | 193 |
| B term | MA 2631 Mathematical Statistics | 24 |
| Spring | MA 542 Regression Analysis | 20 |
|  | MA 559 Statistics Graduate Seminar | 8 |
| C term | MA 2621 Probability for Applications | 177 |
| E1 term | MA 2621 Probability for Applications | 34 |
|  |  |  |
| 16-17 |  |  |
| Fall | MA 3631/MA 540 Mathematical Statistics and Probability | 29 |
|  | MA 559 Statistics Graduate Seminar | 27 |
| A term | MA 2621 Probability for Applications | 144 |
| B term | MA 2631 Mathematical Statistics | 22 |
| Spring | MA 546 Design and Analysis of Experiments | 22 |
|  | MA 559 Statistics Graduate Seminar | 21 |
| C term | MA 2621 Probability for Applications | 196 |
| E1 term | MA 2201 Discrete Mathematics | 34 |
|  | MA 1021 Calculus I | 6 |
|  |  |  |
| 15-16 |  |  |
| A term | MA 2621 Probability for Applications | 128 |
| B term | MA 2612 Applied Statistics II | 46 |
|  | MA 2631 Mathematical Statistics | 19 |
| Spring | MA 542 Regression Analysis | 19 |
| D term | MA 2611 Applied Statistics I | 140 |
| E term | MA 1021 Calculus I | 10 |
|  | MA 2621 Probability for Applications | 39 |
|  |  |  |
| 14-15 |  |  |
| A term | MA 2621 Probability for Applications | 120 |
| B term | MA 2611 Applied Statistics I | 137 |

1. **Projects, Theses, and Dissertations**

2019-2020

1. Chenkai Zheng (MS Project)

Project Title: Applied Statistics in Research and Development.

Sponsor : Barbour Corporation (Internship)

1. Boyu Zhang (MS Project)

Project Title: Statistics in Process Development.

Sponsor : Barbour Corporation (Internship)

1. Yousong Sheng (MS Project)

Project Title: Statistics in Risk Management.

Sponsor : Bank of Communication (Internship)

1. Irantha Weerakurukulasooriya and Yanniode Peri-okonny (MS Project)

Project Title: Meta-Analysis in Analysis of Experiments.

2018-2019

1. Robert Rosen: Major Qualifying Project (MQP).

Project Title: Blood Testing for THC Level.

1. Zhengyu Li, Yang Liu and Ji Zhongnam (MS Project)

Project Title: Analysis of Lifetimes of Leukemia Patients.

1. Charles Alberts: (MS Project)

Project Title: Comparison of Methods for Predicting Academic Performance of Probation Students.

2017-2018

1. Jinglun Wei: (MS Thesis)

Thesis: Multiple Logistic Regression with Missing Data.

1. Anton Libsch: (MS Thesis)

Thesis: An Improved Regression Model to Predict Salaries of Major League Baseball Players.

1. Li Zhang: (MS Thesis)

Thesis: Order Restricted Inference for means with Missing Values.

1. Afnan Almazmomi: (MS Thesis)

Thesis: Properties of Likelihood Inference for Order Restricted Models.

1. Xueer Jing: (MS Project)

Project Title: Statistics in Health Care Insurance Industry.

Sponsor :OFS A Furukawa Company (Internship).

1. Di Wu: (MS Project)

Project Title: Comparing Statistical specification methods using data from born transplant cement industry.

1. Jichuan Wang: (MS Project)

Project Title: Normal Correlation Models to Analyze Bivariate data.

2016-2017

1. Xinyu Chen: (MS Thesis)

Thesis: Constrained Prediction Intervals in Multiple Regression.

1. Jinxin Tao: (MS Thesis)

Thesis: Comparison between confidence intervals of multiple linear regression models with and without restrictions.

1. Yutong Feng: (MS Project)

Project Title: Analyzing Experiments with missing data.

2015-2016

1. Wang Shuo: (MS Thesis)

Thesis: An Improved Meta-Analysis of Cylindrical-Type Time Series Data with Applications to Forecasting Problem in Environmental Study.

1. **Independent Studies conducted at WPI**

|  |  |  |
| --- | --- | --- |
| Term | Title | Enrolment |
| 19-20 |  |  |
| Fall | Advanced Mathematical Statistics (PhD) | 2 |
| Spring | Advanced Mathematical Statistics (PhD) | 2 |
| C term | Probability for Applications | 1 |
| Summer | Design and Analysis of Experiments (MS) | 2 |
|  |  |  |
| 18-19 |  |  |
| Spring | Advanced Mathematical Statistics (PhD) | 2 |
| Summer | Probability for Applications | 1 |
|  |  |  |
| 17-18 |  |  |
| Fall | Advanced Mathematical Statistics (PhD) | 1 |
| Spring | Advanced Mathematical Statistics (PhD) | 2 |
| A term | Probability for Applications | 1 |
|  |  |  |
| 16-17 |  |  |
| Spring | Advanced Mathematical Statistics (PhD) | 1 |
|  |  |  |
| 15-16 |  |  |
| Fall | Advanced Mathematical Statistics (PhD) | 1 |
| Spring | Advanced Mathematical Statistics (PhD) | 1 |
| C term | Probability for Applications | 1 |

1. **Academic Advising at WPI**

Graduate:

All Statistics master’s students (from Fall 2016 to present)

Undegraduate:

1. Kayleigh Ann Campbell (Class of 21)
2. Molly Julia Folino (Class of 22)
3. Agathe Lasnier (Class of 22)
4. Zhifei Ma (Class of 22)
5. **List of Publications**
6. **Peiris, T.B.** and Bhattacharya, B., “Order Restricted Inferences in Regression”, *Journal of Multivariate Analysis,* V 151 C, P.133-150, October 2016, [DOI:10.1016/j.jmva.2016.07.008].
7. Wang, S., Kim, S and **Peiris, T.B**., “An Improved Meta-Analysis Cylindrical-Type Time Series Data with Applications to Forecasting Problem in Environmental Study”, *Journal of Applied Statistics,* January 2017, [DOI: 10.1080/02664763.2017.1280451].
8. **Peiris, T.B.** and Kim, S., “Restricted Inference in Circular-Linear and Linear-Circular Regression” , *Sri Lankan Journal of Applied Statistics*, V 17-1 p. 39-49 June 2016, [DOI: 10.4038/sljastats.v17i1.7844].
9. Nandram, B. and **Peiris, T. B.,** “Bayesian Analysis of a ROC Curve for Categorical Data Using a Skew-Binormal Model”, *Statistics and Its Interface,* V 11-2, P. 369-384, January 2018, [DOI: <http://dx.doi.org/10.4310/SII.2018.v11.n2.a13>].
10. Shazeeb, M.S., Howes,S., Peiris, T.B., Sotak, C.H., and Pins, G.D., "Developing quantitative MRI parameters to characterize host response and tissue ingrowth into collagen scaffolds",“NMR in Biomedicine”, 2019; e4059. https://doi.org/10.1002/.
11. Kim,S., Peiris, T.B., "Meta analysis of regression: a review and new approach with application to linear-circular regression model,",“Communications in Statistics - Theory and Methods”,2020, [DOI: 10.1080/03610926.2019.1679183]
12. **Presentations at Conferences, seminars, and colloquia**

**Session Chair:**

1. Invited session chair of a session at Langenhop Lecture and SIU Mathematics Conference, Southern Illinois University, Carbondale, IL-2018.

**Presentations:**

1. **An Improved Meta-analysis for Analyzing Time Series Circular Regression with Application to Environmental Study**  on May 2019 at the 32nd New England Statistical Symposium, Hartford CT (Invited).
2. **Analysis of ROC Curves** on May 14, 2018 at Langenhop Lecture and SIU Mathematics Conference, Southern Illinois University, Carbondale, IL, (Invited).
3. **Skew-Binormal Model for Analyzing ROC curves** on June 14, 2017 at Joint Meeting of the Spring Research Conference and the Quality and Productivity Research Conference, University of Connecticut, Storrs, CT (Invited)
4. **Constrain Inference in Linear Regression** on April22, 2017 at the 31st New England Statistical Symposium, University of Connecticut, Storrs, CT (Invited)
5. **Order Restricted Inference in Multiple Regression** on March 04, 2016 at University of Tennessee Chattanooga at the Statistical Seminar (Invited).
6. **Introduction to Order Restricted Inference** on July 28, 2015 at Seminar Series of Department of Electrical and Computer Engineering, University of Massachusetts, Dartmouth (Invited).
7. **Order Restricted Inference and Modified Regression Models** on December 28, 2014 at the Institute of Applied Statistics Sri Lankan International Conference at Colombo, Sri Lanka (Invited).
8. **Order Restricted Inference in Linear Regression** on July 13, 2014 at the International Indian Statistical Association Conference at Riverside, California (Contributed).
9. **Constrained Prediction Intervals in Regression** on June 06, 2017 at SRCOS Summer Research Conference at Jekyll Island, Georgia (Poster, Invited).
10. **ROC Curve Analysis for Categorical Data Using a Skew-Binormal Model** on June 06, 2016 at SRCOS Summer Research Conference at Bentonville, Arkansas (Poster, Invited).
11. **Restricted Inference in Regression** on July 08, 2015 at SRCOS Summer Research Conference at Carolina Beach, North Carolina (Poster, Invited).
12. **Constrain Inference in Linear Regression** on April 25, 2015 at the 29th  New England Statistical Symposium (Poster, Contributed).

**Conference Attendance:**

1. **Southern Regional Council of Statistics summer conference at Burns Tennessee (June, 2013). (Attended).**
2. **Conference on Teaching Large Classes at Virginia Tech, Blacksburg Virginia (July 2016). (Attended).**
3. **Papers under review and in preparation**
4. **Peiris, T.B.,** Chen, X., and Tao, J., “Constrained Prediction Intervals and Diagnostic Tests in Multiple Regression” (in preparation).
5. Cummings, E. M., Feng, Y., Messierc, R. J., **Peiris, T. B.,** Roberts, S. C., “Early Stress Activation via Methyl Jasmonate and Loblolly Pine Somatic Embryo Yield” (in preparation).
6. Libsch A, B. and **Peiris, T. B.,** “Predicting Average Annual Value of Free Agent Contracts in Major League Baseball” (in preparation).
7. **Consulting and other professional activities**

Consultant and coordinator of Statistical Consulting Laboratory (Part of Center for Industrial Mathematics and Statistics). The following are some of the projects supervised by me.

1. Project: [Early Stress Activation via Methyl Jasmonate and Loblolly Pine Somatic Embryo Yield](http://labs.wpi.edu/cims/project-portfolio/early-stress-activation-via-methyl-jasmonate-and-loblolly-pine-somatic-embryo-yield/)

Collaboration: Collaborative work with Department of Chemical Engineering (UMASS Amherst), Department of Chemical Engineering and Department of Chemistry, WPI

1. Project: [Quantitative and Rapid Elemental Analysis for Forensic Sourcing of Ordinary Portland Cement](http://labs.wpi.edu/cims/project-portfolio/quantitative-and-rapid-elemental-analysis-for-forensic-sourcing-of-ordinary-portland-cement/).

Collaboration: Collaborative work with Department of Civil and Environmental Engineering and Department of Chemistry & Biochemistry, WPI

1. Project: [Quantitative and Rapid Elemental Analysis for Forensic Sourcing of Ordinary Portland Cement](http://labs.wpi.edu/cims/project-portfolio/quantitative-and-rapid-elemental-analysis-for-forensic-sourcing-of-ordinary-portland-cement/).

Collaboration: Collaborative work with Department of Civil and Environmental Engineering and Department of Chemistry & Biochemistry, WPI

1. Project Title: Applied Statistics in Research and Development.

Sponsor : Barbour Corporation (Internship)

1. Project Title : Statistics in Process Development.

Sponsor : Barbour Corporation (Internship)

1. Project Title : Statistics in Risk Management.

Sponsor : Bank of Communication (Internship)

1. **Honors, awards, and recognition**
2. Michael H. Kutner Junior Faculty Poster Travel Award, 2017 Southern Regional Council on Statistics.
3. Michael H. Kutner Junior Faculty Poster Travel Award, 2016 Southern Regional Council on Statistics.
4. International Indian Statistical Association Travel Award (from American Statistical Association) 2014.
5. Department nomination for Dissertation Research Award, SIUC, 2013– 2014.
6. Department nomination for Doctoral Fellowship, 2013– 2014.
7. Passed Doctoral Qualifying Exam with the highest marks 2011.
8. **WPI committee or administrative assignments**
9. Member of Graduate Admission Committee. (2017 – Present)

I review more than half of the applications for Statistics master’s program (currently the largest master’s program at the Mathematics department). I also help the committee chair to organize recruitment events, advertise our programs at conferences, coordinate applicants and the faculty and interview possible TAs.

1. Member of the PhD preliminary Exam committee ( 2015 – Present)

I write questions for the preliminary exam for students who took Advanced Mathematical Statistics as an independent study with me, grade them and ask questions in their oral part of the exam to check their understanding of the concepts.

1. Member of the PhD Qualifying exam committee ( 2015 – Present)

I write questions for MA 540 and MA 541 (Mathematical Statistics I and II) for the qualifying exam and grade them.

1. Organizer of the Statistical Alumni meet ( 2016 – Present)
2. Member of the visual committee (2016-2017)

The committee decides what to display in monitors and how to use the hallway walls and display bords to show ongoing things in the

1. Member of the department service committee ( 2016-2018)

The committee debates issues and develop solutions for our Calculus and Statistics service courses.

1. **Referee services**
2. Book Chapter (**Modern Age Statistics**): Bayesian Order-Restricted Inference of Multinomial Counts from Small Areas (**Division of Forestry Statistics, Indian Council of Forestry Research and Education**, June 2020)
3. Book Chapter (**Modern Age Statistics**): Bayesian Inference of a Finite Population Mean Under Length-Biased Sampling (**Division of Forestry Statistics, Indian Council of Forestry Research and Education**, October 2018)
4. Semiparametric Bayesian Analysis of Transformation Spatial Mixed Models for Large Datasets (**Statistics and Its Inference**, October 2018).
5. Semivarying coefficient least squares support vector regression analyzing high-dimensional gene-environmental data (**Journal of Applied Statistics**, January 2017).
6. Report on Hierarchical Full Bayesian Robust Principal Component (**Statistics and Its Interface**, March 2016)**.**
7. Iterative Posterior Regularized NMF based Speech enhancement with speech and noise bases update (**Statistics and Its Interface**, December 2015).
8. Estimation of the parameters of life for distributions having power hazard function based on progressively Type-II censored data (**Statistical Methodology**, February 2015).
9. An exponential-squared estimator in the autoregressive (AR) model with heavy-tailed errors by (**Statistics and Its Interface**, October 2014).
10. **Service**
11. Coordinator of Statistics Master’s Program (2016 – Present)

I meet with all the new master’s students prior to their first semester to discuss their background and their goals and give them some advice to choose the classes and options for their capstone. I also meet with them before each semester to see their progress and answer if they have any questions.