

Zheyang Wu, Ph.D.

Professor of Mathematical Sciences  
Worcester Polytechnic Institute  
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## PROFESSIONAL EXPERIENCE

### 1. Education

- Ph.D. in Biostatistics, 2009, Yale University, New Haven, CT.
- M.Phil. in Epidemiology & Public Health, 2007, Yale University, New Haven, CT.
- M.S. in Mathematics, 2004, University of New Orleans, New Orleans, LA.
- B.S. in International Trade, 1998, Chongqing University, Chongqing, China.

### 2. Teaching experience at WPI

- 2021/09 – , Professor of Mathematical Sciences.
- 2015/09 – 2021/08, Associate Professor of Mathematical Sciences, Bioinformatics and Computational Biology, and Data Science.
- 2009/08 – 2015/08, Assistant Professor of Mathematical Sciences.

### 3. Work experience other than teaching

- 1998/09 – 2001/08, China Shipbuilding Trading (Kunming) Company, Kunming, China.

## TEACHING

### 4. Teaching innovations at WPI

- (1) **Cofounder of Bioinformatics and Computational Biology (BCB) Program at WPI.** Co-created BS, BS/MS, MS, and PhD programs in BCB.
- (2) **Statistics program development:** Co-created the new PhD program in Statistics.
- (3) **New course creation:** BCB504/BCB4004/MA584/MA4603 Statistical Methods in Genetics and Bioinformatics. This is a foundational course for the BS, BS/MS, MS, and PhD degrees in Bioinformatics and Computational Biology (BCB). It is also cross-listed as a Mathematics (MA) course for undergraduate and graduate students, which opens a potential new direction in biostatistics.
- (4) **Course redesign and sharing:** MA2611 Applied Statistics I. New teaching plan has been created based on a new design of 36 topic modules and educational technology. Innovated teaching materials include module-based high quality lecture videos, note-taking-friendly slides in LaTeX, online homework assignments and exercises based on WeBWorK and Poll Everywhere, computer labs based on R Markdown, database of over 1,000 exercise problems and answers in LaTeX and WeBWorK formats. The new design well supports both on-campus and remote teaching. Materials available on Canvas for sharing. Similar teaching innovation work has been done for MA2610 Statistics in Life Sciences in 2020 B term.

- (5) **Course redesign and sharing:** MA2631 Probability. Innovated teaching has been created and implemented based on a new design of 54 topic modules. New teaching materials include 55 high-quality lecture videos and notes, 84 pages of lecture content in LaTeX, a database of 102 problems and answers in LaTeX for homework, sample exams, and exams. The new design well supports both on-campus and remote teaching. Materials have been shared with faculty on Canvas.

## 5. Courses taught at WPI

(Lectured courses, containing in total 2178 undergraduate and graduate students.)

- (1) 2021-Fall BCB540/BCB4004/MA584/MA4603 *Statistical Methods in Genetics and Bioinformatics* (4 sections, 29 students)
- (2) 2021-E MA2611 *Applied Statistics I* (25 students)
- (3) 2021-Spring MA541/MA4632 *Probability and Mathematical Statistics II* (2 sections, 12 students)
- (4) 2021-C MA2611 *Applied Statistics I* (4 sections, 83 students)
- (5) 2020-B MA2610 *Applied Statistics for Life Sciences* (2 sections, 48 students)
- (6) 2020-A MA2631 *Probability* (Combined section, 35 students)
- (7) 2020-E MA2611 *Applied Statistics I* (Combined section, 54 students)
- (8) 2019-Fall BCB540/BCB4004/MA584/MA4603 *Statistical Methods in Genetics and Bioinformatics* (4 sections, 16 students)
- (9) 2019-B MA2610 *Applied Statistics for Life Sciences* (3 sections, 59 students)
- (10) 2019-B MA2611 *Applied Statistics I* (6 sections, 165 students)
- (11) 2019-A MA2611 *Applied Statistics I* (5 sections, 131 students)
- (12) 2019-E MA2611 *Applied Statistics I* (2 sections, 35 students)
- (13) 2018-Fall MA546 *Design & Analysis of Experiments* (17 students)
- (14) 2018-B MA2610 *Applied Statistics for Life Sciences* (3 sections, 52 students)
- (15) 2018-B MA2611 *Applied Statistics I* (6 sections, 139 students)
- (16) 2018-A MA2611 *Applied Statistics I* (5 sections, 111 students)
- (17) 2018-E MA2611 *Applied Statistics I* (2 sections, 35 students)
- (18) 2018-Spring BCB510 *BCB Seminar* (5 registered students, 30+ audience on average)
- (19) 2018-Spring MA541/MA4632 *Probability and Mathematical Statistics II* (2 sections, 8 students)
- (20) 2018-D MA2611 *Applied Statistics I* (2 sections, 52 students)
- (21) 2017-Fall BCB540/BCB4004/MA584/MA4603 *Statistical Methods in Genetics and Bioinformatics* (4 sections, 28 students)

- (22) 2017-B MA2610 *Applied Statistics for Life Sciences* (3 sections, 49 students)
- (23) 2017-E MA2611 *Applied Statistics I* (2 sections, 24 students)
- (24) 2015-Fall BCB510 *BCB Seminar* (1 registered students, 30+ audience on average)
- (25) 2015-B MA2610 *Applied Statistics for Life Sciences* (3 sections, 37 students)
- (26) 2015-A MA2611 *Applied Statistics I* (4 sections, 99 students)
- (27) 2015-Fall BCB540/BCB4004/MA584/MA4603 *Statistical Methods in Genetics and Bioinformatics* (4 sections, 19 students)
- (28) 2015-E MA2611 *Applied Statistics I* (2 sections, 28 students)
- (29) 2014-Fall MA540/MA4631 *Probability and Mathematical Statistics I* (2 sections, 20 students)
- (30) 2014-E MA2611 *Applied Statistics I* (2 sections, 16 students)
- (31) 2014-Spring BCB540/BCB4004/MA584/MA4603 *Statistical Methods in Genetics and Bioinformatics* (4 sections, 29 students)
- (32) 2014-D MA2610 *Applied Statistics for Life Sciences* (3 sections, 68 students)
- (33) 2014-C MA2611 *Applied Statistics I* (4 sections, 60 students)
- (34) 2013-Fall MA540/MA4631 *Probability and Mathematical Statistics I* (2 sections, 24 students)
- (35) 2013-E MA2611 *Applied Statistics I* (2 sections, 10 students)
- (36) 2013-Spring MA541/MA4632 *Probability and Mathematical Statistics II* (2 sections, 26 students)
- (37) 2013-D MA2610 *Applied Statistics for Life Sciences* (2 sections, 36 students)
- (38) 2013-C MA2611 *Applied Statistics I* (4 sections, 91 students)
- (39) 2012-Fall MA546 *Design & Analysis of Experiments* (15 students)
- (40) 2012-D MA2610 *Applied Statistics for Life Sciences* (2 sections, 40 students)
- (41) 2011-Spring BCB540/BCB4004/MA584/MA4603 *Statistical Methods in Genetics and Bioinformatics* (7 students)
- (42) 2011-Fall MA540/MA4631 *Probability and Mathematical Statistics I* (24 students)
- (43) 2011-Fall MA540/MA4631 *Probability and Mathematical Statistics I* (25 students)
- (44) 2011-Spring MA546 *Design & Analysis of Experiments* (14 students)
- (45) 2011-D MA2610 *Applied Statistics for Life Sciences* (2 sections, 57 students)
- (46) 2011-C MA2611 *Applied Statistics I* (4 sections, 96 students)
- (47) 2010-D MA2610 *Applied Statistics for Life Sciences* (2 sections, 43 students)
- (48) 2010-C MA2611 *Applied Statistics I* (3 sections, 86 students)
- (49) 2009-Fall MA546 *Design & Analysis of Experiments* (4 students)

## 6. Projects, Theses and Dissertations

(Archived writings are available at <http://www.wpi.edu/Pubs/ETD/> or upon request.)

### PhD dissertations:

November 19, 2022

- (1) Hong Zhang, PhD Thesis (Mathematical Sciences), *Novel P-Value Combination Method for Signal Detection in Large-Scale Data Analysis*, May 2018.

**Master's theses:**

- (1) Ruosi Zhang, Master's Thesis (Bioinformatics and Computational Biology), *Simulations of Different P-value Combination Methods Using SNPs at Diverse Biology Levels*, September 2019.
- (2) Yibo Wu, Master's Thesis (Bioinformatics and Computational Biology), *Genome Studies of Gene Expression and Alternative Splicing During iPSC Skeletal Muscle Induction and Differentiation*, May 2019.
- (3) Siqin Li, Master's Thesis (Bioinformatics and Computational Biology), *Genome Studies of Chromatin Accessibility and Gene Expression during iPSC Skeletal Muscle Induction and Differentiation*, December 2018.
- (4) Xiaohui Chen, Master's Thesis (Applied Statistics), *Bahadur Efficiencies for Statistics of Truncated P-Value Combination Methods*, May 2018.
- (5) Jiadong Fang, Master's Thesis (Applied Statistics), *Calculating One-sided P-Value for TFisher Under Correlated Data*, May 2018.
- (6) Xue Li, Master's Thesis (Bioinformatics and Computational Biology), *Predicting Gene Expression through Integrating Epigenetic Data by Mixed-Effect Model*, May 2015.

**Master's capstone / research projects:**

- (1) Jingyan Sun (Bioinformatics and Computational Biology), *Incorporating functional information to genetic association detection by GFisher*, May 2020.
- (2) Xuan Jiang (Applied Statistics), *Comparison of several predictive methods of identifying vulnerable plaque progression*, May 2018.
- (3) Yifan Zhao (Bioinformatics and Computational Biology), *Understanding the Graphlet Algorithm and Applying it to GWAS Analysis*, May 2017.
- (4) Shanzhang Nong (Applied Statistics), *The Algorithm and Computation of the Graphlet Screening Procedure*, May 2016.
- (5) Jun Zhang (Applied Statistics), *Use Linear Mixed Effect Model to Control the Dependence in Gene Expression Prediction*, May 2016.
- (6) Zhuoying Wang (Applied Statistics), *Apply Orthogonal Matching Pursuit Algorithm to Detection of Missing Heritability*, May 2015.
- (7) Yijun Zhang (Applied Statistics), *EM Algorithm and Bayesian Method for Protein Motif Identification*, August 2015.
- (8) Jason Kost (Bioinformatics and Computational Biology), *Exome Sequencing Data Process and Analysis for Amyotrophic Lateral Sclerosis*, May 2015.
- (9) Leyi Zhang (Applied Statistics),  *$L_0$ -Norm Based Model Selection Strategies for Weak Signal Detection and Gene Hunting*, December 2014.

- (10) Huaming Sun (Applied Statistics), *Differential gene expression analysis of RNA-seq in Caenorhabditis elegans with Cuffdiff, DESeq2 and DEXSeq*, May 2014.
- (11) Jing Xuan (Applied Statistics), *Higher Criticism Approach to Detect Rare Variants Using Whole Genome Sequencing Data*, December 2013.
- (12) Li Yang (Applied Statistics), *Novel SNP-set Methods for Genetic Association Study Using Sequencing Data*, December 2013.
- (13) Taoye Chen (Applied Statistics), *A Multi-level Model for Analyzing Whole Genome Sequencing Family Data with Longitudinal Traits*, December 2013.
- (14) Lillian Carrasquillo (Industrial Mathematics), *Hypotension in Sepsis ICU Patients: Predictive Value of Attribute Subsets*, December 2012. Co-advisor, Advisor: Dr. Natasha Markuzon at Draper Laboratory.
- (15) Shiquan He (Applied Statistics), *A Review of Linear Regression and Some Basic Proofs for Lasso*, December 2009.
- (16) Ya Zhang (Applied Statistics), *Pharmaceutical Market Research Based on Statistical Analysis*, December 2009.

#### **Undergraduate Major Qualifying Projects (MQPs):**

- (1) Ethan D. Gouveia *Graphlet Feature Selection*, 2017-A-B, 2018-C-D Terms.
- (2) Kevin Brian Specht, *Network Medicine*, 2016-B, 2017-C-D Terms. Co-advisor with Dmitry Korkin.
- (3) Joe Brigham, Jiali Gao, Will Lynch, and Josh Nottage, *Credibility Methods in Life and Disability Insurance*, 2014-A-B 2014, 2015-C Terms. Sponsor: Unum Group. Co-advisor with Jon P. Abraham.
- (4) Dongni Zhang, *Integrating Protein-Protein Interaction Network into Genetic Association Studies*, 2014-E-A Terms.
- (5) Yilan Liu, *GPU-Accelerated Computation for Statistical Analysis of the Next-Generation Sequencing Data*, 2013-A, 2014-C-D Terms.
- (6) Jacob Peskoe, *Evaluation of Different Clustering and Classification Algorithms for Continuous and Discrete Data Sets*, 2012-E-A-B Terms. Industrial Sponsor and Co-advisor: BAE Systems.

#### **Undergraduate Interactive Qualifying Projects (IQPs):**

- (1) William Elmore, Tuhina Bhattacharya, Xuyu Qian, Luyang Zhang, *Impact of new genome technologies*, Terms B - D, 2011-2012

#### **Research Experience for Undergraduates (REU) projects funded by NSF:**

- (1) Ryan Pyle (Rice University), Michael Wingate (Messiah College), Eric Oh (Swarthmore College), Katherine Young (Miami University), *Novel Statistical Association Tests for Exome Sequencing Data Analysis*, Summer 2013, REU in Industrial Mathematics and Statistics at WPI, Sponsor: UMass Medical Center.

- (2) Michelle L. DeVeaux (Mount Holyoke College), Sasha S. Indarte (Macalester College), Samantha M. Noreen (Miami University of Ohio), *Evaluation of Glucose Sensor Simulated Use as a Predictor of Device Performance*, Summer 2011, REU in Industrial Mathematics and Statistics at WPI, Sponsor: Instrumentation Laboratory.

**High school students summer research experience in Bioinformatics and Computational Biology:**

- (1) Alex Krebs (Medway High School), Anagha Arvind (Shrewsbury High School), Ramvik-nesh Ramanathan (St. Johns High School), *The Efficiency of Graphlet for Analyzing Ge-nomic Associations*, June 27th – July 29th 2016.

7. Independent studies conducted at WPI

(Study/course credits registered on Banner, excluding those directly led to the dissertations, theses, and projects listed above.)

- (1) 2021-Fall, Shuaichuan Feng (MA 595-F17 - Independent Study - Statistical Genetics)
- (2) 2021-Fall, Ming Liu (BCB 597-F06 - Directed Research)
- (3) 2021-Spring, Ming Liu (DIRECTED RESEARCH/GRADUATE - DR ZHW 598)
- (4) 2021-Spring, Shuaichuan Feng (GENETICAL STATISTICS - ISG ZHW 595F)
- (5) 2020-Fall, Ming Liu (DIRECTED RESEARCH/GRADUATE - DR ZHW 598)
- (6) 2020-Fall, Xiaohui Chen (PHD DISSERTATION - PHD ZHW 699)
- (7) 2020-Spring, Ming Liu (DIRECTED RESEARCH/GRADUATE - DR ZHW 598)
- (8) 2020-Spring, Xiaohui Chen (PRE-DISSERTATION RESEARCH - DR ZHW 698)
- (9) 2020-Spring, Xiaohui Chen (ADVANCED STATISTICAL GENETICS - ISG ZHW 595D)
- (10) 2020-Spring, Jingyan Sun (BIOSTATISTICS RESEARCH - ISG ZHW 595E)
- (11) 2019-Spring, Xiaohui Chen (SNP-SET ANALYSIS - ISG ZHW 595B)
- (12) 2019-Spring, Shaimae Imane Elhajjajy (WPI-UMSS Joint PhD Program rotation research project)
- (13) 2018-Fall, Ruosi Zhang (DIRECTED RESEARCH/GRADUATE - DR ZHW 598)
- (14) 2018-Fall, Xiaohui Chen (SNP-SET ANALYSIS - ISG ZHW 595B)
- (15) 2018-E, Siqin Li (INTERNSHIP - ISG ZHW 597F)
- (16) 2018-Spring, Huaming Sun, Yibo Wu, Ruosi Zhang (DIRECTED RESEARCH/GRADUATE - DR ZHW 598)
- (17) 2017-Fall, Hong Zhang (DIRECTED RESEARCH/GRADUATE - DR ZHW 598)
- (18) 2017-Fall, Xiaohui Chen (INDEPENDENT STUDY/GRADUATE - ISG ZHW 595I)
- (19) 2017-E, Hong Zhang (CPT / INTERNSHIP - ISG ZHW 597E)
- (20) 2016-Spring, Nan Li (STATISTICAL POWER CALCULAT - ISG ZHW 593)
- (21) 2015-Fall, Hong Yan (MATHEMATICAL STATISTICS - ISG ZHW 595A)

- (22) 2015-Spring, Liang Wang (Independent Study – Preliminary Exam in Mathematical Statistics)
- (23) 2015-Spring, Hong Zhang (DIRECTED RESEARCH/GRADUATE - DR ZHW 698)
- (24) 2015-Spring, Xiaofen Zeng (PROBABILITY & MATH STATS II - ISG ZHW 597C)
- (25) 2014-Fall, Yijun Zhang (INDEPENDENT STUDY/GRADUATE - ISG ZHW 597)
- (26) 2014-Fall, Hong Zhang, Zhuoying Wang (BIostatISTICS - ISG ZHW 595)
- (27) 2014-Spring, Jie Bao (DIRECTED RESEARCH/GRADUATE - DR ZHW 598)
- (28) 2013-Fall, Jason Kost (DIRECTED RESEARCH/GRADUATE - DR ZHW 598)
- (29) 2013-Fall, Jing Xuan (BIostatISTICS - ISG ZHW 595)
- (30) 2013-Fall, Jie Bao, Renxiang Wang (INDEPENDENT STUDY/GRADUATE - ISG ZHW 597)
- (31) 2013-Summer, Dan Huangfu, Huaming Sun (INDEPENDENT STUDY/GRADUATE - ISG ZHW 597)
- (32) 2013-Spring, Taoye Chen, Yang Li (DIRECTED RESEARCH/GRADUATE - DR ZHW 598)
- (33) 2013-Spring, Yiwei Liu (BIostatISTICS - ISG ZHW 595)
- (34) 2013-Spring, Jason Kost (MS THESIS - THES ZHW 599)
- (35) 2012-Fall, Patchara Santawisook (DEV.STAT.METH.FOR WHOLE GENOME - ISP ZHW 4000)
- (36) 2012-Fall, Yiwei Liu, Li Yang (DIRECTED RESEARCH/GRADUATE - DR ZHW 598)
- (37) 2012-Fall, Jason Kost (GENETIC VARIANT ANALYSIS - ISG ZHW 500G)
- (38) 2012-Fall, Jason Kost (MS THESIS - THES ZHW 599)
- (39) 2012-Spring, Yunyun Zhang (DIRECTED RESEARCH/GRADUATE - DR ZHW 598)
- (40) 2011-Fall, Yiwei Liu (NONPARAMETRIC STATISTICS - ISG ZHW 501)
- (41) 2011-Spring, Shiquan He (BIostatISTICS - ISG ZHW 597)
- (42) 2010-Fall, Shiquan He (BIostatISTICS - ISG ZHW 595)
- (43) 2010-Spring, Shiquan He (BIostatISTICS - ISG ZHW 595)

#### 8. Academic advising at WPI

##### **Mentor for Junior faculty:**

- (1) Dr. Yanhua Li, Tenure-track Assistant Professor, Computer Science Department and Data Science Program, WPI, 2015. Co-mentor with Prof Dmitry Korin.

##### **Mentor for postdoctoral fellows:**

- (1) Dr. Mihnea Stefan (Mike) Andrei (co-advised with Dr. Jian (Frank) Zou), 2019 – 2020.
- (2) Dr. Gonzalo Contador Revetria Andres (co-advised with Dr. Jian (Frank) Zou), 2019 – .

- (3) Dr. Yevgeniy M Ptukhin (co-advised with Dr. Jian (Frank) Zou), 2018 – 2019.

**Advisor for PhD students:**

- (1) Ming Liu (Bioinformatics and Computational Biology, WPI), Expected graduation 2023.
- (2) Shuaichuan Feng (Statistics, WPI), Expected graduation 2023.
- (3) Xiaohui Chen (Statistics, WPI), Expected graduation 2022.
- (4) Hong Zhang (Statistics, WPI), Graduated 2018. Senior Scientist at Merck Research Laboratories of Merck & Co., Inc.

**Dissertation committee member for PhD students:**

- (1) Yanzhao Wang (Statistics, WPI), Expected to graduate 2022. Advisor: Dr. Jian (Frank) Zou.
- (2) Hongzhu Cui (Bioinformatics and Computational Biology, WPI), Graduated 2020. Advisor: Dr. Dmitry Korkin.
- (3) Hong Yan (Statistics, WPI), Graduated 2018. Advisor: Dr. Jian (Frank) Zou.
- (4) Nathan Johnson (Bioinformatics and Computational Biology, WPI), Graduated 2018. Advisor: Dr. Dmitry Korkin.
- (5) Liang Wang (Mathematical Sciences (Applied Mathematics), WPI), Graduated 2017. Advisor: Dr. Dalin Tang.
- (6) Liwei Zhang (Applied Mathematics, Northeastern University), Graduated 2017. Advisor: Dr. Adam Ding.
- (7) Criselda Ma. Toto, (Applied Mathematics (Statistics), WPI), Graduated 2010. Advisor: Dr. Balgobin Nandram.

**Academic advisor for Master students:**

(MAS: Master of Applied Statistics; BCB: Bioinformatics and Computational Biology)

- |                                   |                               |
|-----------------------------------|-------------------------------|
| (1) Sun, Jingyan (BCB)            | (12) Nong, Shanzhang (MAS)    |
| (2) Cai, Peng (MAS)               | (13) Liu, Yingnan (MAS)       |
| (3) Li, Siqin (BCB)               | (14) Li, Wenjing (MAS)        |
| (4) Chen, Xiaohui (MAS)           | (15) Li, Nan (MAS)            |
| (5) Fang, Jiadong (MAS)           | (16) Huang, Chuqin (MAS)      |
| (6) Wu, Yibo (BCB)                | (17) Li, Xue (BCB)            |
| (7) Zhang, Ruosi (BCB)            | (18) Kost, Jason Edward (BCB) |
| (8) Jiang, Xuan (MAS)             | (19) Bao, Jie (MAS)           |
| (9) Liang, Haiyan (MAS)           | (20) Manseau, Joseph M (MAS)  |
| (10) Radhi, Khalil Mohammed (MAS) | (21) Sun, Huaming (MAS)       |
| (11) Fu, Shuting (MAS)            | (22) Wang, Renxiang (MAS)     |
|                                   | (23) Yu, Yuan (MAS)           |



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|-----------------------------|------------------------|
| (24) Zhang, Leyi (MAS)      | (30) Xuan, Jing (MAS)  |
| (25) Wang, Zhuoying (MAS)   | (31) Chen, Taoye (MAS) |
| (26) Liu, Yiwei (MAS)       | (32) Li, Yang (MAS)    |
| (27) Rosales, Elisa R (MAS) | (33) Sun, Yiming (MAS) |
| (28) Xu, Zhiqing (MAS)      | (34) Zhang, Ya (MAS)   |
| (29) He, Shiquan (MAS)      |                        |

**Academic advisor for undergraduate students:**

- |   |   |
|---|---|
| (1) Doherty, Demetre Leo (23 MA)            | (17) Salina, Eric Carl (19 CS, MA)                            |
| (2) Gamboa, Nathaniel (23 MA,PH)            | (18) Bozdo, Marilda (17 MA)                                   |
| (3) Hunt, Maximilian John (23 MA)           | (19) Ma, Mingkun (17 MA)                                      |
| (4) MacGregor, Michael James (23 PH,MA)     | (20) Skourtis, Ioannis (17 ECE, MA)                           |
| (5) Merto, Sofia Abigail (23 MA)            | (21) Weber, Emily Catherine (17 MA)                           |
| (6) Sirois, Mitchell Scott (23 MA)          | (22) Yu, Rui (17 PH,MA)                                       |
| (7) Murdza, Andrew Paul (21 MA)             | (23) Zhang, Tete (16 BCB)                                     |
| (8) Nabahani, Jihan (21 IE,MA)              | (24) O'Brien, Justin Alexander (Special Undergraduate PH, MA) |
| (9) Walsh-Costello, Maye (21 MA)            | (25) Macaluso, Jeremy Vincent (16 MA,CS)                      |
| (10) PageRubin, Danielle Berit (21 MA)      | (26) Zhao, Yifan (15 BCB)                                     |
| (11) PageWalsh-Costello, Maye (21 MA)       | (27) Hess, Justin Peter (14 BCB, MA)                          |
| (12) Adwetewa-Badu, Kwabena Agyeman (20 ME) | (28) Flanagan, Joseph Patrick (14 MA, HUA)                    |
| (13) Phongsopa, Pavee (20 MA)               | (29) Santawisook, Patchara (Actuarial Sciences)               |
| (14) Avendano, Andrea Victoria (20 MA)      | (30) Christofaro, Wesley J De (MA)                            |
| (15) Ramram, Adam (20 PH,MA)                |   |
| (16) Zarate, Christine M (19 MA)            |   |

9. HONORS, AWARDS, AND OTHER RECOGNITION RELATED TO TEACHING

- Student travel award from The 19th Genetic Analysis Workshop, \$1,200, Aug. 24 - 27, 2014. Support my research team of one WPI student.
- Student travel award from The 18th Genetic Analysis Workshop, \$3,600, Oct. 14 - 17, 2012. Support my research team of four WPI students.

**SCHOLARSHIP**

10. List of publications or scholarly contributions  
(Underlined authors are my advisee.)

**Articles published on peer-reviewed journals:**

- (1) Xiaohui Chen, Hong Zhang, Ming Liu, Hong-Wen Deng, **Wu, Zheyang** (2022) “Simultaneous detection of novel genes and SNPs by adaptive p-value combination”, *Frontiers in Genetics*. <https://doi.org/10.3389/fgene.2022.1009428>.
- (2) Shaoju Wu, Wei Zhao, **Zheyang Wu**, Thomas McAllister, Jingwen Hu, Songbai Ji (2022) “Approximating Subject-specific Brain Injury Models via Scaling Based on Head-brain Morphological Relationships”, *Biomechanics and Modeling in Mechanobiology*, in press. DOI: 10.1007/s10237-022-01638-6.
- (3) Liang Wang, Akiko Maehara, Xiaoguo Zhang, Rui Lv, Yangyang Qu, Xiaoya Guo, Jian Zhu, **Zheyang Wu**, Kisten L. Billiar, Jie Zheng, Lijuan Chen, Genshan Ma, Gary S. Mintz, Dalin Tang (2022) “Quantification of Patient-Specific Coronary Material Properties and Their Correlations with Plaque Morphological Characteristics: an In Vivo IVUS Study”, *Int’l J. of Cardiology*, in press.
- (4) Hong Zhang, **Zheyang Wu** (2022) “The General Goodness-of-fit Tests for Correlated Data”, *Computational Statistics & Data Analysis*, Vol. 167. 107379. <https://doi.org/10.1016/j.csda.2021.107379>.
- (5) Hong Zhang, **Zheyang Wu** (2022) “The Generalized Fisher’s Combination and Accurate p-Value Calculation under Dependence”, *Biometrics*. <https://doi.org/10.1111/biom.13634>.
- (6) Hong Zhang, Judong Shen, **Zheyang Wu** (2021) “An efficient and accurate approximation to the distribution of quadratic forms of Gaussian variables”, *Journal of Computational & Graphical Statistics*. <https://doi.org/10.1080/10618600.2021.2000423>.
- (7) Janel O. Johnson, et. al., (my co-authorship through Familial ALS consortium) (2021) “Association of Variants in the SPTLC1 Gene With Juvenile Amyotrophic Lateral Sclerosis”, *JAMA Neurology*, doi:10.1001/jamaneurol.2021.2598. <https://jamanetwork.com/journals/jamaneurology/article-abstract/2783665>.
- (8) Wei Zhao, **Zheyang Wu**, Songbai Ji (2021) “Displacement error propagation from embedded markers to brain strain”, *Journal of Biomechanical Engineering*. 143(10):101001. doi: 10.1115/1.4051050
- (9) Han Yu, Pedro J. del Nido, Tal Geva, Chun Yan, **Zheyang Wu**, Rahul H. Rathod, Xueying Huang, Kristen L. Billiar, Dalin Tang (2021) “A Novel Pulmonary Valve Replacement Surgery Strategy Using Contracting Band for Patients with Repaired Tetralogy of Fallot: An MRI-Based Multi-Patient Modeling Study”, *Frontiers in Bioengineering and Biotechnology*. <https://doi.org/10.3389/fbioe.2021.638934>.
- (10) Liang Wang, Dalin Tang, Akiko Maehara, **Zheyang Wu**, Chun Yang, David Mucicgroso, Mitsuaki Matsumura, Jie Zheng, Richard Bach, Kristen L. Billiar, Gregg W Stone, and Gary S. Mintz (2020) “Using intravascular ultrasound image-based fluid-structure interaction models and machine learning methods to predict human coronary plaque vulnerability change”, *Computer Methods in Biomechanics and Biomedical Engineering*, <http://doi.org/10.1080/10255842.2020.1795838>.
- (11) Han Yu, Pedro J del Nido, Tal Geva, Chun Yang, **Zheyang Wu**, Rahul H Rathod, Xueying Huang, Kristen L Billiar, Dalin Tang (2020) “Multi-Band Surgery for Repaired Tetral-

- ogy of Fallot Patients with Reduced Right Ventricle Ejection Fraction: A Pilot Study”, *Frontiers in Physiology*, published: 19 March 2020 doi: 10.3389/fphys.2020.00198.
- (12) Hong Zhang; Jiashun Jin; **Zheyang Wu** (2020) “Distributions and Power of Optimal Signal-Detection Statistics in Finite Case”, *IEEE Transaction On Signal Processing*. Vol. 68, 1021–1033. <https://ieeexplore.ieee.org/document/8961113>.
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  - (14) Lei Ding, Hannah Schluter, Matthew Szcus, Rushdy Ahmad, **Zheyang Wu**, Weifeng Xu (2020) “Comparison of statistical tests and power analysis for phosphoproteomic data,” *Journal of Proteome Research*. doi: 10.1021/acs.jproteome.9b00280.
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- (86) Dalin Tang, Liang Wang, Jie Zheng, **Zheyang Wu**, Akiko Meahara, Chun Yang, Richard Bach, David Muccigrosso, Gary S. Mintz, "Introducing Stress-Based Quantitative Plaque Vulnerability Index for Patients with Coronary Artery Disease", *Arteriosclerosis, Thrombosis and Vascular Biology (ATVB)*. *Arterioscler Thromb Vasc Biol.* 2015;35:A379
- (87) Liang Wang, Jie Zheng, Akiko Maehara, Gary S. Mintz, Rui Fan, Chun Yang, Richard Bach, David Muccigrosso, **Zheyang Wu**, Kristen L. Billiar, Jian Zhu, Genshan Ma, Dalin Tang, "Human Coronary Plaque Progression Correlated Positively with Baseline Plaque Wall Stress and Strain and Negatively with Baseline Flow Shear Stress: an IVUS-Based Patient Follow-Up Study Using 3D FSI Models with Cyclic Bending"; *Proceedings of The 7th World Congress of Biomechanics, Volume 5*, pp. 151, ISBN: 978-1-63439-381-2, Currant Associates, Inc., Red Hook, New York, 2015.
- (88) Heng Zuo, Dalin Tang, Chun Yang, Tal Geva, Xueying Huang, Rahul H. Rathod, Vasu Gooty, Alexander Tang, **Zheyang Wu**, Kristen L. Billiar, Pedro J. del Nido, "Mechanical Stress Maybe a Predictor for Pulmonary Valve Replacement Surgery Outcome: A Multi-Patient Study Based on Pre- and Post-Operation Cardiac Magnet Resonance Image Data from Patients with Repaired Tetralogy of Fallot", *The 7th World Congress of Biomechanics, Boston, USA, July 6-11, 2014*. *The 7th World Congress of Biomechanics, Volume 5*, pp. 508, ISBN: 978-1-63439-381-2, Currant Associates, Inc., Red Hook, New York,
- (89) Dalin Tang, **Zheyang Wu**, Chun Yang, 3D FSI models and truly predictive methods for plaque rupture prediction, *First International Conference on Computational Fluid Dynamics (CFD) in Medicine and Biology in conjunction with the Seventh International Biofluid Mechanics Symposium March 25-30, 2012*, Crowne Plaza Dead Sea, Ein Bokek, Dead Sea, Israel, March 2012.
- (90) Dalin Tang, Chun Yang, **Zheyang Wu**, Gador Canton, Kristen Billiar, Mehmet H. Kural, Jie Zheng, Richard Bach, Pamela K Woodard, Thomas S. Hatsukami, Chun Yuan, Predicting carotid plaque rupture: from modeling to potential patient screening and clinical applications. *The 7th International Symposium on Biomechanics in Vascular Biology & Cardiovascular Disease*, April 25 - 27, 2012.
- (91) **Zheyang Wu**, Chun Yang, Dalin Tang, A predictive method for human carotid plaque rupture using in vivo serial MRI with follow-up scan showing actual rupture and MRI-based 3D models with fluid-structure interactions, *Proceedings of the ASME 2011 Summer Bioengineering Conference, SBC2011-53098*, June 22-25, 2011, Farmington, Pennsylvania, USA.

## 11. Presentations at conferences, seminars, and colloquia

- (1) (Invited) “P-value Combination Tests for Correlated Data Analysis”, Department of Statistics and Probability Colloquium, Michigan State University, October 29, 2019.
- (2) “P-value combination methods for integrative meta-analysis of genome-wide associations”, Poster, American Society of Human Genetics Annual Meeting, Houston, TX, October 15–19, 2019.
- (3) (Invited) “A P-value Combination Framework for Integrative Meta-Analysis of Genome-Wide Associations”, International Chinese Statistical Association (ICSA) China Conference, Nankai University, Tianjin, China. July 1–4, 2019.
- (4) (Invited) “P-value Combination Tests for Correlated Data Analysis”, Department of Mathematical Sciences Colloquium, Michigan Tech, April 5, 2019.
- (5) “Novel Optimal and Adaptive P-value Combination Tests”, Poster, American Society of Human Genetics Annual Meeting, San Diego, October 16–20, 2018.
- (6) (Invited) “Optimal and Data-Adaptive P-value Combination Tests For Correlated Data”, Tsinghua University, Beijing, China. July 30, 2018.
- (7) (Invited) “Novel Optimal and Data-Adaptive P-value Combination Tests”, 2018 International Chinese Statistical Association China Conference, Qingdao, China. July 2–5, 2018.
- (8) (Invited) “Optimal and Data-Adaptive P-value Combination Tests For Correlated Data”, Yunnan University of Finance and Economics, July 9, 2018.
- (9) (Invited) “Optimal and Data-Adaptive P-value Combination Tests For Correlated Data”, The Hong Kong University of Science and Technology, Department of Electronic & Computer Engineering, June 23, 2018.
- (10) (Invited) “Optimal and Data-Adaptive P-value Combination Tests For Correlated Data”, Hong Kong Baptist University, Department of Mathematics, June 22, 2018.
- (11) (Invited) “Optimal and Adaptive P-value Combination Methods”, The 2nd International Conference on Econometrics and Statistics (EcoSta 2018), City University of Hong Kong, June 19–21, 2018.
- (12) (Invited) “On Statistical Association and Prediction Methods for Study of Coronary Plaque Progression”, Southeastern University, Nanjing, China, June 19, 2018.
- (13) (Invited) “The gGOF and tFisher: Optimal and Data-Adaptive P-value Combination Tests With Applications in Omics Data Analysis”, The 1st International Symposium on Genomics and Translational Medicine, Suzhou, P. R. China, Jun 14–17, 2018.
- (14) “Optimal Association Tests for Finding Weak Genetic Effects”, Poster at IMA Workshop of Innovative Statistics and Machine Learning for Precision Medicine, September 14 – 16, 2017, University of Minnesota.
- (15) (Invited) “Signal Detection and Goodness-Of-Fit Tests For Correlated Data”, 61st ISI World Statistics Congress (WSC), July 16 – 21, 2017, Marrakech, Morocco.
- (16) (Invited) “Statistical Detection and Prediction when Signals are Weak, Rare, Correlated, and Interactive”, April 25, 2017, AbbVie Inc., Worcester.

- (17) "Optimal Association Tests for Finding Weak Genetic Effects", Poster at Gordon Research Conferences Quantitative Genetics & Genomics – Exploiting Context and Increasing Predictive Value in Complex Trait Genetics, Feb 26 - Mar 3, 2017, Galveston, TX, United States
- (18) (Invited) "Optimal Methods for Detecting Weak and Sparse Signals Based on Correlated Features in Genetic Association Studies", 10th ICSA (International Chinese Statistical Association) International Conference, Shanghai Jiao Tong University, Shanghai, China, December 19-22, 2016.
- (19) (Invited) "Methods for Detecting Weak and Sparse Signals Among Correlated Features", Department of Mathematics, Northeastern University, November, 8, 2016.
- (20) "Detection Boundary and Optimal Association Tests", Poster at Human Genetics & Genomics, Gordon Research Conference, July, 2015.
- (21) (Invited) "Approximating the Distributions of Optimal Goodness-of-Fit Tests with Applications in GWAS", The 29th New England Statistical Symposium, University of Connecticut, April 24-25, 2015.
- (22) (Invited) "Patterns of genetic effects and the power of genetic association studies", Department of Electronic & Computer Engineering, HKUST, Hong Kong, January. 2015.
- (23) (Invited) "Optimal tests for weak and sparse signal detection and the calculation of their distributions", Departments of Mathematics, HKBU, Hong Kong, January. 2015.
- (24) (Invited) "Patterns of genetic effects and the power of genetic association studies", Departments of Mathematical Sciences, IUPUI, Sept. 2014.
- (25) "Detection Boundary and Optimal Association Tests for Rare and Weak Genetic Effects", Poster at Human Single Nucleotide Polymorphisms & Disease, Gordon Research Conference, August, 2014
- (26) (Invited) "Genetic Effects and Optimal Statistical Association Tests Using GWAS and Sequence Data", Departments of Bioinformatics and Computational Biology and Biostatistics, Brown University, April 2014.
- (27) (Invited) "Statistical Signal Detection For Hunting Genes Using High-Dimensional Genetic Data", Departments of Mathematics, Northeastern University, January 2014.
- (28) "Detection Boundary and Higher Criticism Approach for Rare and Weak Genetic Effects", American Society of Human Genetics Annual Meeting, Boston, MA, October 2013.
- (29) (Invited) "Genetic Effects and Statistical Power of Gene Hunting Using GWAS and Sequence Data", Department of Quantitative Health Sciences, Umass Medical School, September 2013.
- (30) "Truncated and weighted transformation methods for combining p-values", Joint Statistical Meetings, Montreal, Quebec, Canada, August 2013.
- (31) (Invited) "Truncated and weighted Z-transformation methods for combining p-values", New England Statistics Symposium, University of Connecticut, CT, April 2013.

- (32) "A multi-level model for analyzing whole genome sequencing family data with longitudinal traits", Genetic Analysis Workshop 18, Stevenson, WA, October, 2012.
- (33) (Invited) "Detection Boundary and Higher Criticism Approach for Sparse and Weak Genetic Effects", International Chinese Statistical Association Symposium, Boston, MA, June 2012.
- (34) (Invited) "Higher criticism for high dimensional regression with application to gene detection", International Conference and Exhibition on Biometrics & Biostatistics, Omaha, NE, March 2012.
- (35) "Detection Boundary and Higher Criticism Approach for Sparse and Weak Genetic Effects", New Researchers in Statistics and Probability, UCSD, CA, July 2012.
- (36) "Higher Criticism for Detecting Sparse and Weak Genetic Effects", Joint Statistical Meetings, San Diego, CA, July 2012.
- (37) "On model selection strategies to identify genes underlying binary traits", Joint Statistical Meetings, Miami, FL, August 2011.
- (38) (Invited) "Higher Criticism for High Dimensional Data with Application to Genome-wide Association Studies", New England Statistics Symposium, University of Connecticut, CT, April 2011.
- (39) (Invited) "Penalized model selection and asymptotic minimaxity", International Conference on Statistics and Society, Beijing, China, July 2010.
- (40) (Invited) "Model selection methods for high-dimensional data and their applications to genome-wide association studies", University of Connecticut Department of Statistics, March 2010.
- (41) "Power of genome-wide search strategies for binary trait loci", American Society of Human Genetics Annual Meeting, DC, November 2010.
- (42) "Power of genome-wide search strategies for binary trait loci", International Genetic Epidemiology Society Meeting, Boston, MA, October, 2010.
- (43) "Gene-based Higher Criticism methods for large scale exonic SNP data", Genetic Analysis Workshop 17, Boston, MA, October, 2010.
- (44) "A genome-wide association testing method incorporating linkage disequilibrium", Joint Statistical Meetings, Vancouver, British Columbia, Canada, August, 2010.
- (45) "Model selection and sharp asymptotic minimaxity", Post Presentation, Innovation and Inventiveness in Statistics Methodologies, Yale University, New Haven, CT, May 2009.
- (46) (Invited) "Model selection methods for high-dimensional data and their applications to genome-wide association studies", Department of Statistics, West Virginia University, WV. March 2009.
- (47) (Invited) "Model selection methods for high-dimensional data and their applications to genome-wide association studies", Division of Biostatistics at New York University School of Medicine, NY. March 2009.
- (48) (Invited) "Model selection methods for high-dimensional data and their applications to genome-wide association studies", Department of Preventive Medicine, Northwestern University, IL. March 2009.

- (49) (Invited) "Model selection methods for high-dimensional data and their applications to genome-wide association studies", Department of Mathematical Sciences, Worcester Polytechnic Institute, MA. April 2009.
- (50) "Gene detection and regression", Department of Mathematical Sciences, Worcester Polytechnic Institute, MA. April 2009.
- (51) (Platform Presentation) "Power of three model selection methods for genome-wide association data", American Society of Human Genetics Annual Meeting, Philadelphia, PA, November 2008.
- (52) "Power of model selection methods for genome-wide association studies," Joint Statistical Meetings, Denver, CO, August 2008.
- (53) "Locally D-optimal designs for multistage models and heteroscedastic polynomial regression models," Louisiana Chapter of the ASA, New Orleans, LA, June 2004.

## 12. Scholarship in progress

### Research articles in preparation:

- (1) Ming Liu, Hong Zhang, Xiaohui Chen, John Landers, Zheyang Wu "TFisher and the secondary analysis of GWAS data analysis of ALS". in preparation.
- (2) Ming Liu, Hong Zhang, Xiaohui Chen, Dmitry Korkein, Zheyang Wu "Integrating functional information in to gene-based SNP-set association tests by GFisher".
- (3) Xiaohui Chen, Hong Zhang, Hong-wen Deng, Zheyang Wu "Adapting to Unknown Genetic Effects For Novel Gene Detection Using GWAS Summary Data".

## 13. Fellowships and grants received, applied for but not received, or pending

### Grants received:

- (1) PI, NSF Statistics Program, DMS-2113570, "New Techniques to Combine Measures of Statistical Significance from Heterogeneous Data Sources with Application to Analysis of Genomic Data", \$200,000, 08/01/2021 - 07/31/2024.
- (2) Co-Investigator, NIH-NICHD, 1R15HD104169-01A1, "Biomechanical factors affecting metatarsal fatigue and bone stress injury risk". PI: Karen Troy at WPI. \$462,645.00. 09/01/2021 - 08/31/2024.
- (3) PI, NSF Statistics Program, DMS-1812082, "Optimal and Adaptive p-Value Combination Methods with Application to ALS Exome Sequencing Study", \$150,000, 07/01/2018 - 06/30/2022.
- (4) PI, NSF Statistics Program, DMS-1309960, "Optimal tests for weak, sparse, and complex signals with application to genetic association studies", \$109,999, 08/15/2013 - 07/31/2017.
- (5) PI, Sponsored Research Agreement, Data and Statistical Sciences Department, AbbVie Inc. "Patient Subgrouping through Interactive Associations", \$48,354, 08/15/2017 - 05/05/2018.

- (6) PI, Subcontract of NIH grant from University of Massachusetts Medical School, "Analysis of deep sequencing data to identify genes causative for neurodegenerative diseases", \$93,174, 04/01/2012 - 03/31/2014.
- (7) Co-PI, NSF DMS-1337943, "MRI: Acquisition of High-Performance Computing System for Research, Education and Training", \$363,579, 09/01/2013 - 07/31/2017 (PI: Homer Walker at WPI).
- (8) Co-investigator, NIH NHLBI, 1R15HL121761-01A1, "Arrhythmia detection using a smart-phone", \$388,706, 08/01/2014 - 07/31/17. (PI: Ki H. Chon at WPI).
- (9) Co-investigator, NIH NCI, 5R01CA166379-02, "MR-Guided Precision Conformal Ablation Therapy for Brain Tumors", \$3,790,423, 09/01/2013 - 04/30/2018. (PI: Gregory Fischer at WPI).
- (10) Co-investigator, NIH, 5R01AR063691-03, "A Prospective Study of Human Bone Adaptation Using a Novel In-Vivo Loading Model", 08/16/2013 - 08/31/2017. \$1,436,413. (PI: Karen Troy at WPI).
- (11) Senior Personnel, National Science Foundation, DMS-1263127, "REU Site: Research Experiences for Undergraduates in Industrial Mathematics and Statistics", \$382,000, 05/01/13 - 04/30/16 (PI: Suzanne L. Weekes).
- (12) Senior Personnel, National Science Foundation, DMS-9732338, "REU Site: Research Experiences for Undergraduates in Industrial Mathematics and Statistics", \$333,000, 05/01/10 - 04/30/13 (PI: Suzanne L. Weekes).
- (13) Travel award, National Institute for Mathematical and Biological Synthesis workshop "Using Bioinformatics Data and Tools to Engage Students in Problem Solving: A Curriculum Development Workshop", \$1,500, Jan. 06-10, 2013.
- (14) Travel award, Institute for Mathematics and its Applications workshop "Group Testing Designs, Algorithms, and Applications to Biology", \$1,200, Feb. 13-17, 2012.

**Pending:**

- (1) Preparation: Co-PI and Lead Statistician, NIH, "Evidence-Based Predictive Pain Integrative Center (EPPIC)". Lead PI: Jean King, Emmanuel Agu, and Lisa Conboy. Submitted on Feb 04, 2022.

**Applied for but not received:**

- (1) PI, Simons Foundation, "Novel statistical and computational methods to combine p-values". Proposed budget: \$94,856.00. Submission: Sept 28th, 2021.
- (2) Co-Investigator, NIH, "A deep-learning model-based tool to monitor concussion risk in contact sports". Proposed budget: \$2,488,922.00. PI: Songbai Ji. Submission: Nov 5th, 2021.
- (3) Co-Investigator, NIH/DHHS, "A deep learning model-based approach for concussion prediction in contact sports". Proposed budget: \$2,334,806.00. PI: Songbai Ji at WPI. Submission: Feb 2nd, 2021.



- (4) Senior Personnel, NIH/DHHS, “iSickleCare Data Hub Data Management and Analytics Core (DMAC)”. Proposed budget: \$2,637,72.00. PI: Agu, Emmanuel O. Submission: Dec 9th, 2020.
- (5) Co-Investigator, NIH, “Same Day Onsite Fabrication of Custom Silicone Earmolds for Pediatric Hearing Aids and Ear Growth Prediction via Machine Learning”. Proposed budget: \$468,871.00. PI: Zheng, Yihao. Submission: Oct 27th, 2020.
- (6) PI, NIH/NIGMS, R01, “Powerful statistical framework for integrative and causal analysis of genetic summary data”. Proposed budget \$1,719,048.00 Proposed period: 01/01/2021 - 12/31/2025. Submission: June 5th, 2020.
- (7) Co-Investigator, NIH/DHHS, “A pre-computed brain response atlas for neural health monitoring”. Proposed budget: \$2,414,478.00. PI: Songbai Ji. Submission: July 6th, 2020.
- (8) Advisor for PhD Student Ming Liu’s dissertation proposal submission to Microsoft Ada Lovelace Fellowship. Submission: Sept 21st, 2020.
- (9) Co-Investigator, NIH, R15, “Same Day Onsite Fabrication of Custom Silicone Earmolds for Pediatric Hearing Aids and Ear Growth Prediction via Machine Learning”. Proposed budget: \$468,871.00. Proposed period: 07/01/2021 - 06/30/2024. PI: Yihao Zheng at WPI. Submission: Oct 28th, 2020.
- (10) Co-Investigator, DMAC, “iSickleCare Data Hub Data Management and Analytics Core”, Proposed budget: \$2,637,728.00, PI: Emmanuel Agu. Submission: Dec 8th, 2020.
- (11) Co-Investigator, NIH/DHHS, R01 proposal PI: Songbai Ji at WPI. Submitted Oct 2019.
- (12) Co-Investigator, “Combining IVUS, OCT, FSI Models and Machine Learning Methods to Predict Coronary Plaque Progression and Vulnerability Changes”, National Natural Science Foundation of China. Collaboration with Southeast University, China. Submitted Feb 2019.
- (13) Co-Investigator, NIH/DHHS, “Disease association studies by integrating systems data”, \$391,826.00, PI: Dmitry Korkin at WPI. Submitted 16-Feb-18.
- (14) Co-Investigator, NIH/DHHS, “A pre-computed brain response atlas for neural health monitoring”, \$2,444,425.00, PI: Songbai Ji at WPI. Submitted 2-Jul-18.
- (15) Co-Investigator, NIH/DHHS, “Disease association studies by integrating systems data”, \$392,245.00, PI: Dmitry Korkin at WPI. Submitted 16-Nov-18.
- (16) Provided a support letter for Prof Xu, Weifeng, MIT, 2018.
- (17) Co-Investigator, NIH, “PET/MRI-Based Modeling to Quantify Inflammation Impact on Plaque Vulnerability”, \$3,497,075, Proposed period 07/01/18 - 06/30/23, PI: Dalin Tang at WPI.
- (18) Co-PI, NSF, “Collaborative Research: A New Plaque Vulnerability and Data-Model-Prediction-Validation-Simulation Approach for Vulnerable Plaque Research”, \$896,266, Proposed period 07/07/18 - 06/30/23, PI: Dalin Tang at WPI.
- (19) Co-Investigator, NIH, “A pre-computed brain response atlas for sports concussion prediction”, \$1,903,732, Proposed period 07/01/18 - 06/30/23, PI: Songbai Ji at WPI.

- (20) Co-Investigator, NIH, "Multi-Modality Image and Modeling to Predict Plaque Progression and Vulnerability", \$3,889,809, Proposed period 01/07/18 - 06/30/23, PI: Dalin Tang at WPI.
- (21) PI, NIH National Institute of Neurological Disorders and Stroke, R03, "Finding Novel ALS Genes: Optimal Tests for Weak and Correlated Effects and Analysis of Largest ALS Exome Sequencing Data", \$149,669, Proposed period 04/01/2017 - 03/31/2019.
- (22) PI, NSF DMS, Statistics Program, "Statistical Development for Calculating Distributions of Optimal Signal Detection Tests Under Realistic Data Properties", \$206,061, Proposed period 07/01/2017 - 06/30/2020.
- (23) Co-Investigator, NIH/, "Multi-Modality Image and Modeling to Predict Plaque Progression and Vulnerability", \$3,914,471, Proposed period 07/01/17-06/30/22. PI: Dalin Tang at WPI.
- (24) PI, NIH National Institute of Neurological Disorders and Stroke, R03, "Obtaining Novel ALS Genes: Optimal Tests for Weak Effects and Analysis of Largest ALS Exome Sequencing Data", \$149,884, Proposed period 04/01/2016 - 03/31/2018.
- (25) Co-PI, NSF/DMS - NIH/NIGMS joint program, "Collaborative Research: MRI-Based FSI Models for Personalized RV Surgery Design and Outcome Prediction", \$879,218, Proposed period 07/01/16-06/30/21. PI: Dalin Tang at WPI.
- (26) Co-Investigator, NIH, NLM Express Research Grants in Biomedical Informatics (R01), "Disease association studies by integrating systems data", \$1,461,995, Proposed period 04/01/16-03/31/20. PI: Dmitry Korkin.
- (27) Core Faculty, NSF Major Research Instrumentation (MRI) for Bioinformatics and Computational Biology Research and Education. PI: Dmitry Korkin at WPI.
- (28) Senior Personnel, NSF Enriched Doctoral Training in the Mathematical Sciences (EDT). "EDT: Integrating PhD Curriculum with Industrial and Interdisciplinary Projects", \$566,180, Proposed period 07/01/2016 - 06/30/2019. PI: Luca Capogna at WPI.
- (29) PI, NIH National Institute of Neurological Disorders and Stroke, R03, "Develop an Optimal Association Test for Exome Sequencing Data", \$145,149, Proposed period 07/01/2015 - 06/30/2017.
- (30) Co-Investigator, NIH/NIBIB, R15, "MRI-Based FSI Models and Prediction of Plaque Progression and Vulnerability", \$3,869,095. Proposed period 01/01/2016 - 12/31/2020. PI: Dalin Tang at WPI.
- (31) CoPI, NSF Computational and Data-enabled Science and Engineering (CDS&E). "Computational and data-enabled methods for large-scale correlated phenomena", Submitted 12/09/2014. PI: Homer Walker at WPI.
- (32) Core Faculty, NSF NRT (Research Traineeship) "Big data science and bioinformatics research traineeship at WPI", \$1,500,00, Summer 2014 (PI: Elke A. Rundensteiner).
- (33) Co-PI, Industrial grant, "Arrhythmia detection using a smartphone", \$300,000, Summer 2013 (PI: Ki H. Chon at WPI).

- (34) Co-Investigator, NIH, R01, "A Patient-Centered Approach to Develop Multidimensional Biomarkers in Ovarian Cancer", \$1,000,000, Summer 2013 (PI: Cristiano Ferlini, Danbury Hospital, CT).
- (35) PI, NIH National Institute of Neurological Disorders and Stroke, R03 "Secondary analysis of exome sequencing data to detect novel ALS genes"; \$168,930; Fall 2013.
- (36) PI, Sloan Research Fellowship; \$100,000; Fall 2013.
- (37) PI, NIH National Institute of Neurological Disorders and Stroke, R03 "Secondary analysis of exome sequencing and GWAS data to detect novel ALS genes"; \$168,930; Fall 2012.
- (38) Co-Investigator, NIH, R33, "A New Method to Develop 3D Biomarkers in Solid Malignancies", \$1,461,192, Spring 2013 (PI: Cristiano Ferlini at Danbury Hospital).
- (39) Senior Personnel, NSF IGERT-CIF21 "Interdisciplinary Training in Data Analytics for Scientific Innovation", \$3,297,804, Summer 2012 (PI: Elke Angelika Rundensteiner at WPI).
- (40) Co-Investigator, NIH "Patient-specific predictive methods and optimal predictors for plaque rupture", \$2,000,000, Spring 2012 (PI: Dalin Tang at WPI).
- (41) Senior personnel, NSF-MRI, "MRI: Acquisition of a High-Performance Computing System for Research, Education, and Training", \$268,642, Spring 2012 (PI: Homer Walker at WPI).
- (42) Co-Investigator, NIH Director's Transformative Award, "Triple Helix Forming DNA Spring Probes for Chromatin Precipitation", \$1,537,582, Spring 2012 (PI: Tanja Dominko at WPI).
- (43) PI, NSF Statistics Program, "The most powerful gene-detection methods for identifying weak, sparse and complex genetic effects using GWAS data", \$229,995, Fall 2011.
- (44) Co-PI, NSF "Serial MRI-Based Computational and Statistical Models to Predict Plaque Rupture", \$1,999,508, Fall 2011 (PI: Dalin Tang at WPI).
- (45) Co-PI, NSF "Fich and ChIP(S)- Fishing for Chromatin Regulatory Molecules Using DNA Sequence", \$1,297,425, Fall 2011 (PI: Tanja Dominko at WPI).
- (46) Co-Investigator, NIH R01 "Motion retardant multi-channel pulse oximetry for prediction of blood loss", Fall 2010 (PI: Ki H. Chon at WPI).
- (47) Co-PI, NSF "Serial MRI-Based Computational and Statistical Models to Predict Plaque Rupture", Fall 2010 (PI: Dalin Tang at WPI).
- (48) PI, NSF "Statistical study for gene detection aided by genetic interaction and linkage disequilibrium using GWAS data", \$132,508, Fall 2010.
- (49) PI, NIH R21 "Exploratory statistical study in epistasis and LD aided gene detection using GWAS data", \$376,948, Fall 2010.
- (50) PI, NIH R21 "Studying model-selection strategies for gene mapping with the aid of gene-gene interactions", \$355,171, Fall 2009.

#### 14. Patents awarded or pending

- (1) Co-inventor, U.S. Provisional Application Serial No.: 61/489,075 "Computational Modeling for a Atherosclerotic Plaque Rupture" (Inventor: Dalin Tang at WPI).

#### 15. Consulting

- (1) Grave Instruments Incorporated (Statistical Consulting 2011).

#### 16. Other Items

##### **Software packages:**

- *Qapprox*: R package for approximation to the survival functions of quadratic forms of Gaussian variables. Available on CRAN <https://cran.r-project.org/web/packages/Qapprox/index.html>
- *GFisher*: R package for a generalized Fisher's  $p$ -value combination method. Available on CRAN <https://CRAN.R-project.org/package=GFisher>
- *TFisher*: R package for thresholding Fisher's  $p$ -value combination method. Available on CRAN: <https://cran.r-project.org/web/packages/TFisher/index.html>.
- *SetTest*: R package for group testing procedures for signal detection and goodness-of-fit tests. Available on CRAN: <https://cran.r-project.org/web/packages/SetTest/index.html>.
- *MarkerSearchPower*: R package for calculating statistical power of detecting disease markers based on model selection strategies.

#### 17. Honors, awards and recognition related to scholarship/creativity

- (1) Mathematics Faculty Award, University of New Orleans, 2004.
- (2) Graduate Fellowship, Yale University, 2004-2005.

### **SERVICE**

#### 18. WPI administrative leadership, committee assignments, department or campus-wide

##### **Campus level service:**

- (1) Member of Steering Committee, Bioinformatics and Computational Biology (BCB) Program, August 2009 - Present.

##### **Service at Department of Mathematical Sciences:**

- (1) NTT Statistics faculty searching committee: 2020-2021
- (2) Served as a Professional Associate for faculty promotions: 2016, 2017, 2020.
- (3) Member, Graduate Program Committee, August 2011 - August 2012, August 2019 –
- (4) Member, Graduate Admission Committee, August 2014 - May 2015, August 2017 - August 2019

- (5) Teaching evaluation committee for peers: 2016, 2020.
- (6) Professional Development Workshop Series – Applying for Jobs in Academia, Fall 2017
- (7) Chair for PhD Preliminary Exams: Liang Wang (Applied Mathematics); Lu Chen (Statistics); Hong Yan (Statistics)
- (8) Member, Undergraduate Committee, September 2010, 2013 - August 2014.
- (9) Member, Center for Industrial Mathematics and Statistics, October 2009 - 2017.
- (10) Member, WPI Bioinformatics Faculty Hiring Committee, 2010-2011, 2012 - 2013.
- (11) Co-coordinator, Project Presentation Day, 2012.
- (12) Judge, WPI Graduate Research Achievement, 2012.
- (13) Member, Colloquium Committee, 2009 - 2010.

**Service for Statistics program:**

- (1) Co-organizer for Statistical Seminar. 2016 –.
- (2) Organizer, designer and grader: GCE Exams in Probability and in Mathematical Statistics I and II (MA540, MA541), 2011 - Present.
- (3) Admission of new students for the Master in Applied Statistics program and PhD in Statistics program.
- (4) Contributions to new hirings for faculty positions in statistics and related to statistics.
- (5) Supporting the annual statistical alumni meetings.

## 19. Memberships and offices held in professional societies

**Professional society membership:**

- (1) American Statistical Association (ASA)
- (2) Institute of Mathematical Statistics (IMS)
- (3) The American Society of Human Genetics (ASHG)
- (4) International Chinese Statistical Association (ICSA)

## 20. Conference organization, editorial and referee services

**Grant proposal reviews:**

- (1) NSF Panel for DMS/MRI, 2021
- (2) NSF Panel for DMS/NIGMS, 2020
- (3) National Security Agency, Mathematical Sciences Program, Grants for Research in the Mathematical Sciences, 2016
- (4) Kentucky Science and Engineering Foundation, Research & Development Excellence Program, 2016

**Journals served peer-reviews:**

- (1) IEEE/ACM Transactions on Computational Biology and Bioinformatics
- (2) Mathematical Reviews
- (3) Scientific Reports
- (4) Electronic Journal of Statistics
- (5) Annals of Statistics
- (6) Journal of the American Statistical Association
- (7) Annals of Applied Statistics
- (8) IEEE Transaction on Signal Processing
- (9) Journal of Statistical Planning and Inference
- (10) Statistical Analysis and Data Mining
- (11) Annals of the Institute of Statistical Mathematics
- (12) Statistics and Its Interface
- (13) Statistical Methodology
- (14) Journal of the Korean Statistical Society
- (15) Statistical Applications in Genetics and Molecular Biology
- (16) Bioinformatics
- (17) Frontiers in Statistical Genetics and Methodology
- (18) Annuals of Human Genetics
- (19) Genetics
- (20) Human Genetics
- (21) Genomics
- (22) BMC Research Notes
- (23) BMC Genetics
- (24) BMC Medical Genomics
- (25) BMC Bioinformatics

**Editorial Board:**

- (1) Member of Review Editorial Board, Frontiers in Statistical Genetics and Methodology
- (2) Member of Review Editorial Board, Austin Statistics

**Conference organization:**

- (1) Scientific Committee Member, The 1st International Symposium on Genomics and Translational Medicine, Suzhou, China, June 14-17, 2018
- (2) Co-organizer of Phylogenetics and Statistical Genetics Section, The 29th New England Statistical Symposium, University of Connecticut, April 24-25, 2015.

- (3) Scientific and Organizing Committee Member, Post-WCB Workshop: Vulnerable Plaques: Data, Modeling, Predictions and Translation to Clinical Applications, Worcester, July 12-13, 2014.
- (4) Organizer and Chair, Statistical Genetics and Genomics Session, International Chinese Statistical Association (ICSA) annual meeting, Boston, 2012.
- (5) Reviewer, The Tenth Asia Pacific Bioinformatics Conference, Melbourne, Australia, 2012.
- (6) Program Committee Member, The 3rd International Conference on BioMedical Engineering and Informatics, Yantai, China, 2010.
- (7) Chair, Asymptotic Theory Session, International Conference on Statistics and Society, Beijing, China, 2010

**Conference mentoring programs:**

- (1) Served as a mentor in the Docent/Mentoring Program for first time attendees in the Joint Statistical Meetings (JSM), in 2016 and 2017.
  - (2) Served as a mentor in the Woman Researcher Mentoring program in Gordon Research Conferences: Quantitative Genetics & Genomics in 2017.
21. Significant civic, cultural, religious, and similar contributions
- (1) April 2019 – , Stroke and Turn Judge, New England Swimming / USA Swimming.