John Mayberry

CONTACT INFORMATION

Department of Mathematics
University of the Pacific
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RESEARCH INTERESTS

Applied probability, statistics, biostatistics, and sports analytics

EDUCATION

University of Southern California, Los Angeles, CA

PhD, Applied Mathematics, May 2008
- Dissertation: *The Effects of Noise on Bifurcations in Circle Maps with Applications to Neural Biology*
- Advisor: Peter Baxendale

M.A., Applied Mathematics, December 2004

California State University, Fullerton, Fullerton, CA

B.A., Mathematics, June 2003
- Dual concentrations in *Pure Mathematics* and *Probability and Statistics*
- Graduated *summa cum laude* with a 4.0 GPA

ACADEMIC JOB EXPERIENCE

University of the Pacific, Stockton, CA
Professor of Mathematics **September 2023–Present**
- Teach 2–3 four-unit courses per semester.
- Lead and collaborate on research projects in water polo analytics, athletic injury risk and prevention, biostatistics, and active learning methodologies.
- Work with interdisciplinary teams to apply mathematical models and data-driven approaches to improve athletic performance metrics and reduce injury risk.
- Advise undergraduate students in mathematics, applied mathematics, and data science majors.
- Serve on university, college, and department committees, including as Faculty Chair during the 2023–2024 academic year.

Associate Professor of Mathematics **September 2015–August 2023**

Assistant Professor of Mathematics **July 2010–August 2015**

Cornell University, Ithaca, NY
Postdoctoral Associate / Visiting Assistant Professor of Mathematics **June 2008–June 2010**
- Research in applied probability and mathematical biology under Dr. Rick Durrett
- Taught one course per semester

University of Southern California, Los Angeles, CA
Teaching Assistant **August 2004–May 2008**
- Taught 1–3 discussion sections per semester

Statistical Consulting and Applied Work

Alpine Orthopaedic Medical Group, St. Joseph's Hospital, Stockton, CA
Statistical Consultant **Spring 2016–Fall 2020**

- Contact: Dr. Jaicharan Iyengar
  - Analyzed clinical, demographic, and geographic data to investigate disparities in orthopedic care and treatment outcomes, contributing to conference presentations on surgeon distribution, NSAID treatment effects, and shared decision-making in orthopedics.
  - Mentored undergraduate and pre-medical students in statistical analysis, research design, and data interpretation, with a focus on health equity and orthopedic outcomes.

Sparta Science, Menlo Park, CA
Statistical Consultant **Spring 2016–Fall 2020**

- Contact: Dr. Phil Wagner
- Built interactive dashboards and predictive models in `R` using the `tidyverse`, `caret`, `rmarkdown`, and `shinydashboard` packages to support data-driven decision-making in sports performance and injury risk.
- Assessed the reliability and validity of force plate metrics and their relationship to athletic performance, contributing to peer-reviewed publications on vertical jump profiling and its links to pitching velocity and injury risk.

Water Polo Analytics Group, Stockton, CA
Statistical Consultant **Summer 2012–Present**

- Contact: James Graham
- Design performance metrics and statistical models for Team USA and Pacific water polo programs.
- Translate analytic findings into actionable insights for coaches and athletes, contributing to tactical and performance improvements.
- Disseminate research outcomes to academic and athletic communities through peer-reviewed publications

Publications

1. Mortola, B. M., Wheeler, S. S., Huang, S., De La Vega, S., Scott, J. J., Meighan, M. L., Hartle, J., Mayberry, J., & Thiemann, T. C. (2025). Assessing pyrethroid resistance mechanisms in individual *Culex tarsalis* (Diptera: Culicidae). *Journal of Medical Entomology*, *58*(2), 1-9. https://doi.org/10.1093/jme/tjaf001. [Epub ahead of print] PubMed PMID: 40036312.
2. Parbtani, S., Mayberry, J., Jayne, C., & Iyengar, J. (2025). Optimizing Glenoid Component Placement and Baseplate Selection with Computer Navigation in Reverse Total Shoulder Arthroplasty. *Journal of Shoulder and Elbow Arthroplasty*, *1*(1), 10-15. [Accepted].
3. Tamsil, K., Parbtani, S., Mayberry, J., & Iyengar, J. (2025). Mapping Out Orthopaedic Care Inequality by Assessing Surgeon Distribution in Six Northern California Counties. *Journal of Health Disparities Research and Practice*, *18*(4), 1175-1182. [Submitted].
4. Ndung'u, M., Galal, S., Tran, E., Peng, M., Chang, J., Vyas, D., Mayberry, J., & Chima, A. (2024). Impact of Inquiry-Based Stress Reduction Intervention on Pharmacy Students' Test Anxiety. *Trends in Higher Education*, *3*(4), 1175-1182.

5. Galal, S. M., Vyas, D., Mayberry, J., Caringal, C., Bui, V., Rogan, E., & Ndung'u, M. (2023). Training pharmacy students to deliver bad news using the SPIKES model. *Currents in Pharmacy Teaching and Learning*, *15*(3), 283-288.
6. Gullickson, J., Gale, L., Mayberry, J., & Killick, L. (2023). Production functions of NCAA men and women water polo matches. *Journal of Sports Analytics*, *9*(2), 141-155.
7. Bernardi, D., Davis, L. L., Graham, J., & Mayberry, J. (2022). Change the rule, change the game? Tactical use and efficacy in elite men's water polo from 2012 to 2021. *International Journal of Performance Analysis in Sport*, *22*(2), 1-17.
8. Mayberry, J., Nattestad, M., & Tuttle, A. (2021). The Structure of an Outbreak on a College Campus. *Mathematics Magazine*, *94*(2), 83-98.
9. Mayberry, J., Mullen, S., & Murayama, S. (2020). What can a jump tell us about elbow injuries in professional baseball pitchers? *The American Journal of Sports Medicine*, *48*(5), 1220-1225.
10. Gullickson, J., Mayberry, J., Gale, L., & Killick, L. (2020). Not throwing away my shot: An analysis of shot features in men's collegiate water polo. *International Journal of Performance Analytics*, *20*(2), 240-253.
11. Graham, J., & Mayberry, J. (2020). The Cost of Losing Team Bias in Water Polo. In *The Economics of Aquatic Sports* (pp. 25-37). Springer.
12. Hill, R. I., Rush, C. E., & Mayberry, J. (2018). Larval food limitation in a Speyeria butterfly (Nymphalidae): How many butterflies can be supported? *Insects*, *9*(4), 179.
13. Galal, S., Vyas, D., Mayberry, J., Rogan, E. L., Patel, S., & Ruda, S. (2018). Use of standardized patient simulations to assess the impact of motivational interviewing training on social-emotional development. *Pharmacy*, *6*(3), 65.
14. Mayberry, J. K., Patterson, B., & Wagner, P. (2018). Improving vertical jump profiles through prescribed movement plans. *The Journal of Strength and Conditioning Research*, *32*(6), 1619–1626.
15. Lydon, W., Vanness, J., Mayberry, J., Rossi, J., & Jensen, C. (2018). Sparta Testing and Vertical Jump Co-predict Fastball Speed in Collegiate Pitchers. *Medicine & Science in Sports & Exercise*, *50*(5S), 445.
16. Mitchell, V., Lydon, W., Vanness, J., Mayberry, J., Rossi, J., & Jensen, C. (2018). Hit or miss: Kinematic predictors of in-game performance in collegiate pitching. *Medicine & Science in Sports & Exercise*, *50*(5S), 664.
17. Galal, S. M., Mayberry, J. K., Wang, A., & Tran, T. (2017). Examining differences between P1 versus P2 students as teaching assistants in a P1 skills-based course. *Currents in Pharmacy Teaching and Learning*, *9*(4), 537–542.
18. Minnes, M., Mayberry, J., Soto, M., & Hargis, J. (2017). Practice makes deeper? Regular reflective writing during engineering internships. *Journal of Transformative Learning*, *4*(2).
19. Graham, J., & Mayberry, J. (2016). The ebb and flow of official calls in water polo. *Journal of Sports Analytics*, *2*(2), 61–71.
20. Pandey, R., Mayberry, J., & Hargis, J. (2016). How does the structure of a college chemistry examination affect pedagogy. *Journal of Science Education*, *17*(2), 53.
21. Cavanaugh, C., Hargis, J., & Mayberry, J. (2016). Participation in the virtual environment of blended college courses: An activity study of student performance. *International Review of Research in Open and Distributed Learning*, *17*(3), 263–275.

22. Sajuthi, A., Carrillo-Zazueta, B., Hu, B., Wang, A., Brodnansky, L., Mayberry, J., & Rivera, A. S. (2015). Sexually dimorphic gene expression in the lateral eyes of *Euphilomedes carcharodonta* (Ostracoda, Pancrustacea). *Evodevo*, *6*(1), 34.
23. Cavanaugh, C., Gajer, E., Mayberry, J., O'Connor, B., & Hargis, J. (2015). Kilimanjaro: A case of meaningful adventure and service learning abroad. *Journal of International Students*, *5*(4), 420–433.
24. Galal, S., Mayberry, J., Chan, E., Hargis, J., & Halilovic, J. (2015). Technology vs. pedagogy: Instructional effectiveness and student perceptions of a student response system. *Currents in Pharmacy Teaching and Learning*, *7*(5), 590–598.
25. Graham, J., & Mayberry, J. (2014). Measures of tactical efficiency in water polo. *Journal of Quantitative Analysis in Sports*, *10*(1), 67-79.
26. Mayberry, J., Hargis, J., Boles, L., Dugas, A., O'Neill, D., Rivera, A., & Meler, M. (2012). Exploring teaching and learning using an iTouch mobile device. *Active Learning in Higher Education*, *13*(3), 203–217.
27. Arterbery, A. S., Fergus, D. J., Fogarty, E. A., Mayberry, J., Deitcher, D. L., Kraus, W. L., & Bass, A. H. (2011). Evolution of ligand specificity in vertebrate corticosteroid receptors. *BMC Evolutionary Biology*, *11*, 14.
28. Durrett, R., Foo, J., Leder, K., Mayberry, J., & Michor, F. (2011). Intratumor heterogeneity in evolutionary models of tumor progression. *Genetics*, *188*(2), 461-477.
29. Durrett, R., & Mayberry, J. (2011). Traveling waves of selective sweeps. *The Annals of Applied Probability*, *21*(2), 699-744.
30. Durrett, R., Foo, J., Leder, K., Mayberry, J., & Michor, F. (2010). Evolutionary dynamics of tumor progression with random fitness values. *Theoretical Population Biology*, *78*(1), 54-66.
31. Durrett, R., & Mayberry, J. (2010). Evolution in predator-prey systems. *Stochastic Processes and Their Applications*, *120*(7), 1364-1392.
32. Mayberry, J., & others. (2009). Gaussian perturbations of circle maps: A spectral approach. *The Annals of Applied Probability*, *19*(3), 1143-1171.

Awards, Grants, and Fellowships

- *Pacific-Stanford PRIMED Program Grant*, National Institute of Dental and Craniofacial Research (NIDCR), National Institutes of Health (NIH), Award No. 1U01DE033276-01. Role: Co-Investigator
- **Eberhardt Teacher/Scholar Award**, University of the Pacific, 2024 — For outstanding achievements in both teaching and scholarship
- **Long Foundation Fellowship**, Thomas J. Long Foundation, 2018–2020 — Support for *Punk, Metal, and the Meaning of Life* course
- **Pacific Arts and Lecture Committee Fellowship**, University of the Pacific, 2018 — Support for *The Revolution Will Be DIY* art exhibit and concert
- **United Methodist Teacher/Scholar Award**, 2017
- **Technology and Innovation Award**, Pacific Sports Analytics Conference, 2017
- **Postdoctoral Fellowship**, Cornell University, 2008–2010 — Partially supported by NSF RTG grant DMS-07-39164
- **Graduate Fellowship**, University of Southern California, 2003
- **NSF Research Experience for Undergraduates (REU)**, Grand Valley State University, 2002

Courses Taught

Pacific: Pacific Seminar (Math and Society; Punk, Metal, and the Meaning of Life), Introduction to Statistics and Probability, Precalculus, Calculus I, Elements of Calculus for Pharmacy, Applied Differential Equations, Numerical Analysis, Introduction to Probability and Mathematical Statistics I & II, Introduction to Linear Algebra, Applied Linear Algebra, Statistical Learning Methods, Random Signals, Sports Analytics for Coaching, Independent Study (Stochastic Processes, Population Genetics)
Cornell: Finite Math for Life and Social Sciences, Real-World Statistical Theory and Applications, Large Deviations
USC (TA): Business Statistics, Calculus I & III, Engineering Math I & II, Intro to Linear Algebra and Differential Equations, Probability Theory, Mathematical Statistics, Real Analysis

Conference Proceedings and Presentations

- Tamsil, K., Parbtani, S., Mayberry, J., & Iyengar, J. (2025, April). *Mapping out orthopaedic care inequality by assessing surgeon distribution in six Northern California counties.* 69th Annual LeRoy C. Abbott Society Scientific Program and 56th Annual Verne T. Inman Lectureship, San Francisco, CA.
- Iyengar, J., Nakka, A., & Mayberry, J. (2023, August). *Examining the effects of NSAID treatment in orthopedics.* Western Orthopaedic Association Annual Meeting, Coeur d'Alene, ID.
- Wulff, A., Nakka, A., Mayberry, J., & Iyengar, J. (2022, July). *The myth of patient participation in shared decision making.* Annual Meeting of the Western Orthopaedic Association, Maui, HI.
- Verlin, N., Gullikson, J., Mayberry, J. K., & Cliburn, D. (2019, September). PoloTrac: A water polo tracking and advanced statistics application. In *Proceedings of the 7th International Conference on Sport Sciences Research and Technology Support (icSPORTS 2019).* Vienna, Austria.
- Williams, C. A., VanNess, J. M., Rossi, J., Mayberry, J., & Jensen, C. D. (2019, June). Lower limb kinematic assessment to predict water polo performance: 3455 Board# 143. *Medicine and Science in Sports and Exercise*, *51*(6S), 949.
- Lydon, W. P., VanNess, J. M., Mayberry, J., Rossi, J., & Jensen, C. D. (2018, May). Sparta testing and vertical jump co-predict fastball speed in collegiate pitchers: 1867 Board 128. *Medicine and Science in Sports and Exercise*, *50*(5S), 445.
- Mitchell, V. R., Lydon, W. P., VanNess, J. M., Mayberry, J., Rossi, J., & Jensen, C. D. (2018, May). Hit or miss: Kinematic predictors of in-game performance in collegiate pitching. *Medicine and Science in Sports and Exercise*, *50*(5S), 664.
- Mayberry, J. (2017, January). Evaluating athlete wellness. Joint Mathematical Meetings, Special Session on Math and Sport, Atlanta, GA.
- Mayberry, J. (2016, January). How does losing team bias affect a water polo game? Joint Mathematical Meetings, Special Session on Math and Sport, Seattle, WA.
- Galal, S., Tran, T., Choi, C., Wang, A., & Mayberry, J. (2014, July). *To peer or near-peer? Examining differences between P1 vs. P2 students as teaching assistants in a P1 skills-based laboratory.* American Association of Colleges of Pharmacy Annual Meeting, Grapevine, TX.
- Avila-Mora, E., Fenn, E., & Mayberry, J. (2013, April). *The effect of math-related autobiographical memory activation on math attitudes and performance.* WPA Convention, Reno, NV.
- Galal, S., Chan, E., Mayberry, J., Hargis, J., & Maker, J. (2011, July). *Instructional effectiveness and student perceptions of a student response system in a PharmD practicum course.* American Association of Colleges of Pharmacy Annual Meeting, San Antonio, TX.

- Priestley, A., Wood, J., & Mayberry, J. (2011, May). *Dental student prediction of pediatric anxiety.* California Society of Pediatric Dentistry/Western Society of Pediatric Dentistry Annual Meeting, San Francisco, CA.
- Raina, A. (2016, April). *A different kind of modeling in the pool.* Avinash Raina High School Math Competition, University of the Pacific.
- Mayberry, J. (2016, October). *Riding the analytics wave to water polo success.* Data Science Hot Topics Seminar, University of the Pacific, San Francisco Campus.
- Mayberry, J. (2015, July). *A different kind of modeling in the pool.* Secondary Integration of Math Modeling and Simulation (SIMMS) Workshop, San Joaquin District Office.
- Mayberry, J. (2015, April). *Riding the analytics wave to water polo success.* Sport Technology Seminar, University of the Pacific.
- Mayberry, J. (2015, October). *Riding the analytics wave to water polo success.* Homecoming Talk, University of the Pacific.
- Mayberry, J. (2015, January). *Flipped Learning and Camtasia.* Secondary Integration of Math Modeling and Simulation (SIMMS) Workshop, San Joaquin District Office.
- Mayberry, J. (2014, October). *Riding the analytics wave to water polo success.* Data Science Hot Topics Seminar, University of the Pacific, San Francisco Campus.
- Mayberry, J. (2012, April). *What are the chances? Paradoxes in probability.* Pacific High School Math Competition.
- Mayberry, J. (2011, July). *Heterogeneity in evolutionary models for tumor progression.* Mini-symposium on Evolutionary Dynamics of Cancer, ICIAM meeting, Vancouver, Canada.
- Mayberry, J. (2011, May). *Evolution in predator-prey systems.* Math Colloquium, Oregon State University.
- Mayberry, J. (2010, May). *Traveling waves of selective sweeps.* Session on Stochastic Models in Population Genetics, Annual Meeting of the Statistical Society of Canada, Quebec City, Canada.
- Mayberry, J. (2010, January). *Traveling waves of selective sweeps.* Applied Math Colloquium, Illinois Institute of Technology.
- Mayberry, J. (2009, July). *Evolution in predator-prey systems.* Special Session on Stochastic Spatial Models in Ecology and Epidemiology, Conference on Stochastic Processes and Applications, Berlin, Germany.
- Mayberry, J. (2009, April). *A spectral approach to Stochastic Integrate-and-Fire models.* 3rd Annual Cayuga Triangle Meeting, Syracuse University.
- Mayberry, J. (2008, March). *Evolution in predator-prey systems.* Probability Seminar, Toronto University.
- Mayberry, J. (2007, November). *Gaussian perturbations of circle maps.* Northeast Probability Seminar, Courant Institute, NY.
- Mayberry, J. (2008, October). *Evolution in predator-prey Systems.* Probability Seminar, Cornell University.
- Mayberry, J. (2008, February). *Stochastic Integrate-and-Fire models.* Joint Probability and Mathematical Biology Seminar, University of Utah.
- Mayberry, J. (2007, November). *Random perturbations of circle maps.* Dynamical Systems Seminar, University of Southern California.

Service and Advising

- **Book Reviews:**
  - Bruce, P. (2013). *Stats: Data and Analytics (SDA)*, Wiley.
- **Referee:**
  - *Annals of Applied Probability*
  - *Biology Letters*
  - *Evidence Based Medicine*
  - *SIAM Journal on Applied Dynamical Systems*
  - *Theoretical Population Biology*
- **Student Advising:**
  - Advisor for pure and applied math majors and minors, Fall 2010 - Present
  - Advisor for data science majors and minors, Fall 2024 - Present
  - New student advisor for exploratory majors, multiple summers (2011-Present)
  - Pacific Punk and Metal Club, 2019 - Present
  - Math Club Advisor, Fall 2011 - Present
  - Cornell Undergraduate Math Modeling Team Advising Committee, Fall 2009
- **Departmental Service:**
  - Actuary Science Director Search Committee, Member, Fall 2017 - Spring 2018
  - Assistant Professor Search Committee, Member, Fall 2016 - Spring 2017
  - Assistant Professor Search Committee, Chair, Fall 2015 - Spring 2016
  - Applied Math Assessment Committee, Member, Fall 2012 - Fall 2019
  - Visiting Assistant Professor Search Committee, Member, Spring 2015
  - Teaching Postdoc Search Committee, Member, Fall 2012 - Spring 2013
  - Speaker Series Organizer, Fall 2011 - Spring 2012
  - Calculus Committee, Member, Fall 2011 - Spring 2013
  - Northern California Undergraduate Mathematics Conference Planning Committee, Member, Spring 2011
  - Applied Math Electives Committee, Member, Fall 2010
- **University/College Service:**
  - Data Science Major Advisory Board, Member, 2024 - Present
  - Academic Affairs Undergraduate Curriculum Committee, Member, 2024 - Present
  - Academic Affairs Undergraduate Curriculum Committee, Co-chair, 2025
  - Institutional Budget Committee, Member, 2024-2025
  - Professional Relations Committee, Chair, 2024 - 2025
  - Professional Relations Committee, Member, 2023 - 2025
  - Academic Council, Chair, 2023 - 2024
  - Academic Council, Executive Board, 2022 - 2025
  - Academic Council, Member, Spring 2021 - 2025
  - Data Science BS Creation Committee, Member, 2022 - 2023
  - Courses and Standards Committee, Member, Summer 2020 - 2024
  - Career Resource Center Advisory Committee, Member, Fall 2016 - Fall 2020

- Experiential Learning Discussion Committee, Member, Fall 2018
- STEM Retention Discussion Committee, Member, Fall 2017
- LMS Vendor Vetting Group, Member, Spring 2015
- Assistant Chaplain Hiring Committee, Chair, Fall 2014
- Student Media Board, Member, Fall 2013 - 2015; 2019 - 2021
- Data Analytics Committee, Member, Fall 2013
- Classroom Building Recycling Co-captain, Fall 2012 - Present

- **Community Service:**
  - Analyzed engagement and outcome data for the Emerge Youth Program in partnership with Concrete Development Inc. (Fall 2024)
  - Conducted statistical analysis of "Stop and Search" data from the Stockton Police Department for Faith in the Valley (Spring 2022)
  - Led activity and discussion on data analysis using Google Spreadsheets for visiting secondary school teachers (Summer 2016)
  - Collaborated on the Secondary Integration of Math Modeling and Simulation Program with the San Joaquin Office of Education (Summer 2014–Summer 2016)
  - Co-organized the *Avinash Raina* High School Math Competition (2012–2019; 2023–Present)

- **Undergraduate Research and Supervision:**
  - Joey Gullickon, Master of Science in Health Science and Exercise Science, Thesis Committee (Predicting shot quality in water polo), Member, Fall 2018 - Spring 2019
  - Bonnie Ryan, Master of Science in Biology, Thesis Committee (Mechanisms and prevalence of permethrin resistance in mosquitoes), Member, Fall 2019 - Spring 2020
  - Brian Oye, Master of Science in Biology, Thesis Committee (The effects of light and temperature on tropical butterfly stratification), Member, 2019 - 2020
  - Billy Mortola, Master of Science in Biology, Thesis Committee (The effect of genotype and enzyme levels on mosquito resistance), Member, 2021 - 2023
  - Leen Yousef, Master of Science in Biology, Thesis Committee (Comparing the methods of testing insecticide resistance in Culex tarsalis), Member, 2024 - Present
  - Mentor for three Pacific Summer Undergraduate Research Fellowships (Austin Tuttle, 2012; Tim Shumate, 2014; James Price, 2015)
  - Mentor for dozens of student research projects in upper-division statistical learning and applied statistics courses, including interdisciplinary collaborations with faculty or staff in Athletics, Chemistry, Dentistry, Pharmacy, Psychology, and Information Technology. One these led to a co-authored publication (Dylan Bernardi and Lucy Davis, 2023)
  - Supervised hundreds of course-based research projects in introductory statistics courses in which students collected original survey data and tested hypotheses about relationships between variables

Technical Skills

- R (dplyr, tidyr, caret, glmnet, rpart, randomForest, plotly, ggplot2, lme4, survival, leaps, forecast, shiny, ggplot2)
- Python (NumPy, pandas, Matplotlib, Seaborn, scikit-learn, basic experience with TensorFlow)
- LaTeX
- MATLAB

Professional Certificates

- Society of Actuaries Exam SRM (Score: 8), 2020 – Exam focused on probability, statistics, and risk modeling.
- Society of Actuaries Exam P (Score: 8), 2018 – Exam focused on probability theory and its applications in actuarial science.