

# John Mayberry

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CONTACT INFORMATION      Department of Mathematics      *Work:* 209.946.3166  
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RESEARCH INTERESTS      probability, statistics, sports analytics

EDUCATION      **University of Southern California**, Los Angeles, CA  
PhD, Applied Mathematics, May 2008  
• Dissertation Topic: 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  
• Concentration in Probability and Statistics

ACADEMIC JOB EXPERIENCE      **University of the Pacific**, Stockton, CA  
*Associate Professor of Mathematics*      **September 2015 - Present**  
• Teaching load of 2-3 four-unit courses per semester.  
• Collaborative research in water polo analytics, athletic injury risk and prevention, mathematical biology, and active learning in higher education  
• Academic and new student advising  
• Service on committees at the departmental, college, and university level

**University of the Pacific**, Stockton, CA  
*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 the supervision of Dr. Rick Durrett  
• Teaching load of one course per semester

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

PROFESSIONAL  
CONSULTING  
EXPERIENCE

**Sparta Science**, Menlo Park, CA

*Statistical Consultant*

**Spring 2016 - Fall 2020**

- Contact: Dr. Phil Wagner
- Built dashboards and predictive models for exploring the impact of exercise plans on countermovement jump scans.
- Explored the reliability and validity of force plate balance assessments.
- Examined connections between force plate assessments and athletic performance/injury risk in a wide range of sports including baseball, basketball, football, soccer, rugby, and volleyball.
- Extensive use of R including the tidyverse collection, caret, markdown, and shiny-dashboard packages.

**Water Polo Analytics Group**, Stockton, CA

*Statistical Consultant*

**Summer 2012 - Present**

- Contact: James Graham
- Design and study the discriminatory value of new statistics for measuring tactical performance in water polo.
- Analyze game data for Team USA and Pacific water polo.
- Build models for predicting game outcome and shot quality.
- Disseminate results to the water polo and academic community.

COURSES TAUGHT

**Pacific:** Pacific Seminar (Math and Society; Punk, Metal, and the Meaning of Life), Introduction to Statistics and Probability, Precalculus, Calculus I, Applied Differential Equations, Numerical Analysis, Introduction to Probability and Mathematical Statistics I and II, Introduction to Linear Algebra, Applied Linear Algebra, Statistical Learning Methods, Random Signals, Sports Analytics for Coaching, Independent Study (Stochastic Processes, Probability Models in Population Genetics, Spatial Models)

**Cornell:** Finite Mathematics for Life and Social Sciences, Statistical Theory and Applications in the Real World, Probability Theory and Stochastic Processes: Topics in the Theory of Large Deviations

**USC (Teaching Assistant):** Probability and Statistics for Business, Calculus I and III, Mathematics for Engineering and Science I and II, Introduction to Linear Algebra and Differential Equations, Introduction to Probability Theory, Mathematical Statistics, Principles of Mathematical Analysis, Probability Theory

PUBLICATIONS

- Bernardi, D., Davis, L. L., Graham, J., and Mayberry, J. K. (2022). Change the rules, change the game? Offensive tactics in elite men's water polo from London to Tokyo. *International Journal of Performance Analysis in Sport*, 1-17.
- Gullickson, J., Gale, L. R., Mayberry, J. K., and Killick, L. (2022). Estimating Production Functions of Sports Teams: Application to Men's NCAA Water Polo. *Journal of Sports Analytics*. (Revise and Resubmit)
- Mayberry, J., Nattestad, M., and Tuttle, A. (2021). The Structure of an Outbreak on a College Campus. *Mathematics Magazine*, 94(2), 83-98.
- Mayberry, J., Mullen, S., and 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.

- Gullickson, J., Mayberry, J. K., Gale, L., and 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.
- Graham, J., and Mayberry, J. (2020). The Cost of Losing Team Bias in Water Polo. In *The Economics of Aquatic Sports* (pp. 25–37). Springer. Journal Publications
- Hill, R. I., Rush, C., and Mayberry, J. K. (2018). Larval food limitation in a *Speyeria* butterfly (Nymphalidae): how many butterflies can be supported? *Insects*, 9(4).
- Minnes, M., Mayberry, J., Soto, M., and Hargis, J. (2018). Practice makes deeper? Regular reflective writing during engineering internships. *Journal of Transformative Learning*, 4(2).
- Galal, S., Vyas, D., Mayberry, J., Rogan, E., Patel, S., and Ruda, S. (2018). Use of Standardized Patient Simulations to Assess Impact of Motivational Interviewing Training on Social–Emotional Development. *Pharmacy*, 6(3), 65.
- Mayberry, J. K., Patterson, B., and Wagner, P. (2018). Improving vertical jump profiles through prescribed movement plans. *The Journal of Strength and Conditioning Research*, 32(6), 1619–1626.
- Galal, S. M., Mayberry, J. K., Wang, A., and 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.
- Pandey, R., Mayberry, J., and Hargis, J. (2016) How does the structure of a college chemistry examination affect pedagogy *Journal of Science education* Volume 17, Number 2, 53-57.
- Cavanaugh, C., Hargis, J., and Mayberry, J. (2016). Participation in the Virtual Environment of Blended College Courses: An Activity Study of Student Performance. *The International Review of Research in Open and Distributed Learning*, 17(3).
- Graham, J., and Mayberry, J. (2016). The ebb and flow of official calls in water polo. *Journal of Sports Analytics*, 2(2), 61–71.
- Cavanaugh, C., Gajer, E., Mayberry, J., O'Connor, B., and Hargis, J. (2015). Kilimanjaro: A case of meaningful adventure and service learning abroad. *Journal of International Students*, 5(4), 420–433.
- Sajuthi, A., Carrillo-Zazueta, B., Hu, B., Wang, A., Brodnansky, L., Mayberry, J., and Rivera, A. S. (2015). Sexually dimorphic gene expression in the lateral eyes of *Euphilomedes carcharodonta* (Ostracoda, Pancrustacea). *EvoDevo*, 6(1), 34.
- Hargis, J., Mayberry, J., and Yee, K. (2015) MOOC Observations Using a Modified F2F Quality Teaching Rubric. *GLOKALde*. 1(3), 27-47.
- Galal, S. M., Mayberry, J. K., Chan, E., Hargis, J., and 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.
- Graham, J., and Mayberry, J. (2014). Measures of tactical efficiency in water polo. *Journal of Quantitative Analysis in Sports*, 10(1), 67–79.
- Mayberry, J., Hargis, J., Boles, L., Dugas, A., O'Neill, D., Rivera, A., and Meler, M. (2012). Exploring teaching and learning using an iTouch mobile device. *Active Learning in Higher Education*, 13(3), 203–217.
- Durrett, R., Mayberry, J., and others. (2011). Traveling waves of selective sweeps. *The Annals of Applied Probability*, 21(2), 699–744.
- Arterbery, A. S., Fergus, D. J., Fogarty, E. A., Mayberry, J., Deitcher, D. L., Kraus, W. L., and Bass, A. H. (2011). Evolution of ligand specificity in vertebrate corticosteroid receptors. *BMC Evolutionary Biology*, 11(1), 14.

- Durrett, R., Foo, J., Leder, K., Mayberry, J., and Michor, F. (2011). Intratumor heterogeneity in evolutionary models of tumor progression. *Genetics*, genetics–110.
- Durrett, R., Foo, J., Leder, K., Mayberry, J., and Michor, F. (2010). Evolutionary dynamics of tumor progression with random fitness values. *Theoretical Population Biology*, 78(1), 54–66.
- Durrett, R., and Mayberry, J. (2010). Evolution in predator–prey systems. *Stochastic Processes and Their Applications*, 120(7), 1364–1392.
- Mayberry, J., and others. (2009). Gaussian perturbations of circle maps: a spectral approach. *The Annals of Applied Probability*, 19(3), 1143–1171.
- Braun, D., Mayberry, J., Malagon, A., and Schlicker, S. (2005). A singular introduction to the Hausdorff metric geometry. *Pi Mu Epsilon Journal*, 12(3), 129–138.

CONFERENCE  
PROCEEDINGS AND  
PRESENTATIONS

- Wulff, A., Nakka, A., Mayberry, J., and Iyengar, J. (2022) *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., and Cliburn, D. (2019). 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., and Jensen, C. D. (2019). Lower Limb Kinematic Assessment to Predict Water Polo Performance: 3455 Board# 143 June 1 9: 30 AM-11: 00 AM. *Medicine and Science in Sports and Exercise*, 51(6S), 949.
- Lydon, W. P., Vanness, J. M., Mayberry, J., Rossi, J., and Jensen, C. D. (2018). Sparta Testing and Vertical Jump Co-predict Fastball Speed in Collegiate Pitchers: 1867 Board 128 May 31 3. *Medicine and Science in Sports and Exercise*, 50(5S), 445.
- Mitchell, V. R., Lydon, W. P., Vanness, J. M., Mayberry, J., Rossi, J., and Jensen, C. D. (2018). 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) Evaluating Athlete Wellness. Joint Mathematical Meetings, Special Session on Math and Sport. Atlanta, GA.
- Mayberry, J. (2016) 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. and Mayberry, J. (2014) *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., and Mayberry, J. (2013) *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., and Maker, J. (2011) *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., and Mayberry, J. (2011) *Dental Student Prediction of Pediatric Anxiety*. California Society of Pediatric Dentistry/Western Society of Pediatric Dentistry Annual Meeting, San Francisco, CA.

OTHER  
PRESENTATIONS

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

HONORS AND  
AWARDS

- 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, Pacific Arts and Lectures Committee, 2018. Support for the “The Revolution will be DIY” art exhibit and concert.
- United Methodist Teacher/Scholar Award, 2017.
- Technology and Innovation Award, Pacific Sports Analytics Conference, 2017.

PROFESSIONAL  
CERTIFICATES

- Society of Actuaries Exam SRM (Score: 8), 2020
- Society of Actuaries Exam P (Score: 8), 2018

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
- New student advisor for exploratory majors, multiple summers between 2011-2021
- Pacific Punk and Metal Club, 2019-present
- Math Club Advisor, fall 2011-present
- New Student Advisor, 2011-2013.
- 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:**

- Academic Council, Member, spring 2021 - present
- Courses and Standards Committee, Member, summer 2020 - present
- 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:**

- Performed data analysis on Stockton Police Department “Stop and Search” data for the nonprofit organization Faith in the Valley, spring 2022.
- Ran activity and discussion on Data Analysis with Google Spreadsheets for a group of secondary school teachers visiting Pacific, summer 2016.
- Partner in the Secondary Integration of Math Modeling and Simulation Program hosted by the San Joaquin Office of Education, summer 2014 - summer 2016.
- *Avinash Raina* High School Math Competition, Co-organizer, 2012-2019.

**Undergraduate Research and Supervision:**

- Joey Gullickon Master’s Thesis Committee (Predicting shot quality in water polo), Member, fall 2018 - spring 2019
- Bonnie Ryan Master’s Thesis Committee (Mechanisms and prevalence of permethrin resistance in mosquitos), Member, fall 2019 - present
- Brian Oye Master’s Thesis Committee (The effects of light and temperature on tropical butterfly stratification), Member, fall 2019 - spring 2020
- Billy Mortola Masters’ Thesis Committee (The effect of genotype and enzyme levels on mosquito resistance), Member, spring 2021 - present
- Mentor for three Pacific Summer Undergraduate Research Fellowships (Austin Tuttle, 2012; Tim Shumate, 2014; James Price, 2015)

PROFESSIONAL  
DEVELOPMENT

- Deepening your Advising Workshop Parts 1 and 2, Online, University of the Pacific, Center for Teaching and Learning, summer 2021 - fall 2021
- Course Design Workshop, Online, University of the Pacific, Center for Teaching and Learning, summer 2020
- Teaching Essentials Workshop, Online, University of the Pacific, Center for Teaching and Learning, summer 2020
- STEM Faculty Learning Community, University of the Pacific, spring 2020 - fall 2020
- Course Redesign Workshop, Stockton, University of the Pacific, Center for Teaching and Learning, summer 2019
- Course Redesign Workshop, Stockton, University of the Pacific, Center for Teaching and Learning, summer 2018