JAMES QUINLAN

EDUCATION

Ph.D., Computational Science, Univ. of Southern Mississippi

Ph.D., Mathematics Education, Ohio State University

M.S., Mathematics, Youngstown State University

B.S., Mathematics, Ohio State University

PROFESSIONAL APPOINTMENTS

Chair, Department of Computer Science
University of Southern Maine, Portland, Maine
2024 – Now

Assistant Professor, Department of Computer Science
University of Southern Maine, Portland, Maine
2023 – Now

Associate Professor, Department of Mathematical Sciences
University of New England, Biddeford, Maine
2016 – 2023

Assistant Professor, Department of Mathematical Sciences
University of New England, Biddeford, Maine
2010 – 2016

Visiting Assistant Professor, Department of Mathematical Sciences
University of New England, Biddeford, Maine
2009 – 2010

Post-Doc Researcher, School of Teaching and Learning
Ohio State University, Columbus, Ohio
2008 – 2009

PUBLICATIONS

Books

Lambers, J. V., Mooney, A. S., Montiforte, V. A., & Quinlan, J. (2025). *Explorations in Numerical Analysis and Machine Learning with Julia.* World Scientific.

Quinlan, J. & Kolibal, J. (2026, in progress). *The Combinatorics of Fibonacci Determinants.*

Software

T. Omtizigt and J. Quinlan, *Universal Numbers Library.* github.com/jamesquinlan/universal

L. Hunhold and J. Quinlan, *MuFoLAB - Multi-Format Linear Algebra Benchmarks*, version v1.0.0, Dec. 2024. doi: 10.5281/zenodo.14540573.

Refereed Journals

Quinlan, J. and Hunhold, L. (2026, accepted). Error Damping and Transfer Fidelity in Multigrids with Emerging Number Formats. In: Michalewicz, M., Gustafson, J., De Silva, H. (eds) Next Generation Arithmetic. CoNGA 2025. *Lecture Notes in Computer Science.* Springer.

Quinlan, J. and Edwards, T. (2025). Classroom Applications of Question Formulation to Support Problem-Solving in Computer Science. *Journal of Computational Science Education, 16*(2).

Hunhold, L., Quinlan, J., & Wesner, S. (2025, November). Numerical Performance of the Implicitly Restarted Arnoldi Method in OFP8, Bfloat16, Posit, and Takum Arithmetics. In *Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis, SC '25,* (pp. 681–694). Association for Computing Machinery, New York, NY, USA. https://doi.org/10.1145/3712285.3759837

Hunhold, L. and Quinlan, J. (2025). Evaluation of Bfloat16, Posit, and Takum Arithmetics in Sparse Linear Solvers. In *IEEE 32nd Symposium on Computer Arithmetic (ARITH)* (pp. 61-68). IEEE.

Quinlan, J. and Omtzigt, E.T.L. (2024). Iterative Refinement with Mixed-Precision Posit Arithmetic. In: Michalewicz, M., Gustafson, J., De Silva, H. (eds) Next Generation Arithmetic. CoNGA 2024. *Lecture Notes in Computer Science*, vol 14666. Springer.

Quinlan, J., & Omtzigt, E. T. L. (2024). Iterative Refinement with Low-Precision Posits. *arXiv* doi: http://arxiv.org/abs/2408.13400

Quinlan, J and Edwards, M. T., (2024) On the Even Distribution of Odd Primes: An On-Ramp to Mathematical Research. *The Mathematics Enthusiast.* Article 17, 21(1 & 2), 327 - 334.

Quinlan, J. (2023). Efficacy and Attitudes Towards Online Homework Systems in First-Semester Calculus. *Ohio Journal of School Mathematics*, 95(1), 26–31.

Omtzigt, E.T.L. and Quinlan, J. (2023). Universal Numbers Library: Multi-format Variable Precision Arithmetic Library. *Journal of Open Source Software, 8(83)*, 5072, https://doi.org/10.21105/joss.05072

Omtzigt, E.T.L. and Quinlan, J. (2022). Universal: Reliable, Reproducible, and Energy-Efficient Numerics. In: Gustafson, J., Dimitrov, V. (eds) Next Generation Arithmetic. CoNGA 2022. *Lecture Notes in Computer Science, 13253.* Springer.

Verkamp, H.J., Hammerschlag, N., Quinlan, J., Langan, J.A., and Sulikowski, J.A. (2021). Reproductive hormone profiles of the blacktip shark (Carcharhinus limbatus) in southern Florida. *Marine and Freshwater Research.*

Edwards, T., & Quinlan, J. (2021). Layering: Showing and hiding objects. *North American GeoGebra Journal, 9*(1), 8-10.

Curran, M., Holt, C., Arciero, M., Quinlan, J., Cox, D., & Craig, A. (2020). Proxy Finnegan Scores for Eat, Sleep, Console in a Cohort of Opioid-Exposed Neonates. *Hospital Pediatrics. 10*(12), 1053–1058.

Quinlan, J. & Kolibal, J. (2016). Trigonometric Integration without trigonometric functions. *Teaching Mathematics and Its Applications, 35*, (4).

Quinlan, J. (2016). Sage: Mathematics in the Cloud. Proceedings of the Twenty-eighth Annual International Conference on Technology in Collegiate Mathematics. ICTCM, Atlanta, GA.

Quinlan, J., & Tennenhouse, C. (2016). Perceived Utility of Typesetting Homework in Post-Calculus Mathematics Courses. *PRIMUS, 26*(1), 53-66.

Quinlan, J. (2016). Mathematicians' perspectives on the utility of software. *The International Journal for Technology in Mathematics Education, 23*,(3), 103-110.

Edwards, T., Quinlan, J., & Strayer, J. (2016). Flip and Add: Explorations in Place Value. *Teaching Children Mathematics.* NCTM, Reston VA.

Quinlan, J. (2016). *Using the tail of a sequence to explore its limit* in Proceedings of the Fourth Annual Southern Connecticut GeoGebra Conference. Southern Connecticut State University, New Haven, CT.

Quinlan, J. (2016). Sage: Mathematics in the Cloud. Proceedings of the Twenty-eighth Annual International Conference on Technology in Collegiate Mathematics. ICTCM, Atlanta, GA.

Quinlan, J. (2015). *An informal approach to least squares* in Proceedings of the Third Annual Southern Connecticut GeoGebra Conference. Southern Connecticut State University, New Haven, CT.

Edwards, M. T., & Quinlan, J. (2015). Virtual Miniature Golf. *Mathematics Teacher, 109*(2), 160-160.

Koyunkaya, M. Y., Kastberg, S., Quinlan, J., Edwards, M. T., & Keiser, J. (2015). Dynamic Right Triangles. *Mathematics Teacher, 109*(4), 320-320.

Edwards, M. T., Quinlan, J., & Day, R. (2015). Repeated square roots. *Mathematics Teacher, 109*(3), 240.

Edwards, T., Quinlan, J., et al. (2014). Fostering Deductive Thinking with Angle Chasing. *Mathematics Teacher.* NCTM, Reston VA.

Quinlan, J. (2013). GeoGebra as a frontend to generating graphics for LaTeX. *North American GeoGebra Journal,* 2(1), 37 – 42.

PRESENTATIONS

Quinlan, J. (2026). *Leveraging Large Language Models for Course Design and Instructional Materials.* In Proceedings of the Joint Mathematics Meetings. Washington, DC: American Mathematical Society.

Hunhold, L. and Quinlan, J. (2025, November). Numerical Performance of the Implicitly Restarted Arnoldi Method in OFP8, Bfloat16, Posit, and Takum Arithmetics. In *SC25: International Conference for High Performance Computing, Networking, Storage and Analysis.*

Quinlan, J. and Hunhold, L. (2025, May). Evaluation of Linear Solvers on Next Generation Arithmetic. *MAA Northeastern Spring Meeting*, Portland, ME.

Hunhold, L. and Quinlan, J. (2025, May). Evaluation of Bfloat16, Posit, and Takum Arithmetics in Sparse Linear Solvers. In *IEEE 32nd Symposium on Computer Arithmetic (ARITH)* (pp. 61-68). IEEE.

Quinlan, J., & Omtzigt, E. T. L. (2024, Feburary). Low Precision Iterative Refinement. Conference on Next Generation Arithmetic (CoNGA'24). National Supercomputing Centre, Singapore.

Quinlan, J. (2024, April). Engaging Students in and out of the classroom. Department of Mathematical Sciences, Bentley University. Invited Talk.

Quinlan, J. (2023, November). After the Bell Rings: Engaging Students Outside the Classroom. Mathematics Association of America (MAA) Northeastern Section, Invited Talk for Distinguished University Teaching Award. Boston College, MA.

Chamberlain, D., & Quinlan, J. (2023, August). Technology Use in Undergraduate Mathematics Classrooms. Mathematics Association of America (MAA), Contributed Paper Session MathFest 2023. Tampa, FL.

Quinlan, J. & Omtzigt, E. T. L., (2023, June). *Universal Numbers Software Library.* Mathematical Association of America Northeastern Section Meeting. Fitchburg State University. Fitchburg, Massachusetts.

Quinlan, J. (2023, March). *Data Mining Methods for Improving Health Outcome.* MaineR Users Group. Northeastern University Roux Institute, Portland, Maine March 30, 2023.

Omtzigt, E. T. L., & Quinlan, J. (2022, March). *Universal: Reliable, Reproducible, and Energy-Efficient Numerics.* Conference on Next Generation Arithmetic (CoNGA). Singapore, China. March 1–3, 2022.

Holt, T. Margaret Curran Michael Arciero, James Quinlan. (2018). *Predictive Value of Finnegan Neonatal Abstinence Scores (FNAS) in infants exposed to narcotics in utero.* North American Primary Care Research Group Annual Meeting Chicago, Illinois November 9-13, 2018

Quinlan, J. (2019, Aug). *Factors and Methods in STEM Student Retention.* Mathematical Association of America (MAA MathFest), Cincinnati, OH.

Quinlan, J. & Deveau, A.M. (2018, Aug). *NSF S-STEM report: what we learned, issues, successes, and recommendations.* Mathematical Association of America (MAA MathFest), Denver, CO.

Quinlan, J. & Deveau, A.M. (2018, July). *Outcomes of an NSF S-STEM Grant: SUCCESS Scholars, Research Opportunities, and Curriculum Evolution.* Poster presentation, The Council of Undergraduate Research (CUR Biennial Conference), Arlington, VA.

Quinlan, J. (2018, June). *NSF S-STEM report: what we learned, issues, successes, and recommendations.* Mathematical Association of America – Spring Meeting of the Northeast Section, New Haven, CT.

Quinlan, J. & Deveau, A.M. (2018, June). *Outcomes of an NSF S-STEM Grant at UNE: SUCCESS Scholars, Research Opportunities, and Curriculum Evolution.* Poster presentation, The Maine Center for Research in STEM Education (RiSE) Center (2018 RiSE Teaching Symposium), Orono, ME.

Quinlan, J. (2017, July). *Developing an academic data science program.* Data Science: Big Data, Big Questions Themed Contributed Paper Sessions. MAA MathFest, Chicago, IL.

Kolibal, J. & Quinlan, J. (2016, July). Solving Differential Equations Using Chebyshev Inner Products. The *Society of Industrial and Applied Mathematics Annual Meeting.* SIAM, Boston, MA.

Quinlan, J. (2016, June). *Securing NSF Grants with Significant Impacts: Advice for Junior Faculty.* Mathematical Association of America – Spring Meeting of the Northeast Section (Section NeXT Speaker), Biddeford, ME.

Quinlan, J. (2016, August). *Using SageMathCloud Worksheets to facilitate computational thinking and collaboration in Calculus.* MAA Math Fest, Columbus, Ohio.

Quinlan, J. (2016, August). *SageMathCloud: An introduction to computational collaboration.* Open Mathematics Conference, Columbus, OH.

Quinlan, J. & Tennenhouse, C. (2016, June). *SageMathCloud.* MAA Northeast Section Meeting. University of New England, Biddeford, ME.

Quinlan, J. (2016, March). Sage: Mathematics in the Cloud. The *Twenty-eighth Annual*

International Conference on Technology in Collegiate Mathematics. ICTCM, Atlanta, GA.

Quinlan, J. (2015, June). *Modeling Machines and Prototyping with GeoGebra.* North American GeoGebra Conference, Miami University, Oxford, OH.

Quinlan, J. (2015, April). *Period, order, and rank of a generalized Fibonacci sequence Modulo n.* University of New Haven, New Haven, CT.

Col, N.F., & Quinlan, J. (2013, September). *Next–Generation Interactive Decision Aids: Breaking Implementation Barriers.* World Congress 3rd Annual Leadership Summit on Shared Decision Making: Adopting a Patient–centered System to Improve Outcomes and Decrease Costs. Boston, MA.

Quinlan, J. & Edwards, T., (2013, March). Utilizing Web Technologies to Supplement Coursework Including Embedding GeoGebra and Hacking Google Web Forms. The *Twenty-fifth Annual International Conference on Technology in Collegiate Mathematics.* ICTCM, Boston, MA.

Edwards, T., & Quinlan, J. (2013, March). Applying the WIN strategy to convert textbook problems into rich, inquiry-based activities using technology. Creating Engaging Tasks from Ordinary Exercises using GeoGebra and the What-if-Not Approach. The *Twenty-fifth Annual International Conference on Technology in Collegiate Mathematics.* ICTCM, Boston, MA.

Col, N.F., & Quinlan, J. (2012, October). *New Methods for Integrating Patient Preferences with Clinical Evidence.* Society for Medical Decision Making, Phoenix, AZ. October 17–19.

Quinlan, J. (2009, August). *Developing graphical user interface for interactive applications in MATLAB using GUIDE.* MAA Math Fest, Portland, OR.

Quinlan, J. (2012, June). *Matrix Reductions, Elementary Matrices, and Solving Systems of Equations.* Midwest Regional GeoGebra Conference, Miami University, Oxford, OH.

GRANTS & PROJECTS
Funded

Principle Investigator (PI). HPC 101. Funded by the Northeastern Section of the Mathematical Association of America. ($750).

Principle Investigator (PI). UMS Transforms Multi-Campus Game Design and Development Project: Computer Graphics. Funded by the UMS Transforms from the Harold Alfond Foundation. ($9,000).

Principle Investigator (PI). *S-STEM: Maine Algorithm for Success in Computing through Initiatives and Innovations* (M-ASCII). National Science Foundation (NSF). Submitted 03/11/2024 ($1,947,488).

Innovative Teaching Grant (2023). Funded by the Center for Collaboration & Development. ($500).

Principle Investigator (PI). *Human Infrastructure Development for Mixed-precision Deep Learning* (2023). Funded by the Maine Economic Improvement Fund (MEIF). ($9,500).

Principle Investigator (PI). *Maine Mathematics and Science Scholars for School and University Collaboration Centered on Educating STEM Students (SUCCESS) Program.* Funded by the National Science Foundation (NSF) DUE 1259896. ($620,788).

Key Personnel / Consultant. *Incorporating Patient Preferences into Decisions about Chronic Pain Management.* Funded by Pfizer Independent Grants for Learning & Change ($748,500).

Co-Principle Investigator (co-PI). *NSF SUCCESS Support Grant.* Funded by the Bangor Savings. ($3,000).

Co-Principle Investigator (co-PI). *Decision Support Transformed: Integrating Patient Preferences with Clinical Evidence.* Funded by the Office of Patient and Population Oriented Research University of New England (PPOR) ($6,678).

Principle Investigator (PI). *The Nature of Software Utilization, Part II.* Funded by UNE Vice President for Research Mini-Grant ($1850).

Pending

Principle Investigator (PI). *Augmented Reality AI-Driven Tree Anatomy Recognition for Arboretum Species Identification and Data Management.* Tree Research and Education Endowment (TREE) Fund from John Z. Duling Grant Program ($19,674).

Co-Principle Investigator (co-PI). *Maine Access-to-Justice (A2J) Tech Lab – Ethical & Explainable AI for Administrative-Law Workflows.* Maine Technology Asset Fund (MTAF). ($235,000).

Submitted - Unfunded Grants

Principle Investigator (PI). *S-STEM: Developing an Inter-institional partnership between 2-year colleges for CS academic pipeline* (USM, 2024). National Science Foundation (NSF). ($1,942,470).

Co-Principle Investigator (co-PI). *Sharing Health Evidence Linking Patients and Providers about Pain: Pain-HELPP.* Funded by the Patient-Centered Outcomes Research Institute (PCORI) ($1,866,608).

Co-Principle Investigator (co-PI). *Under-represented Maine STEM scholars grant.* Coke-Cola ($250,000).

Co-Principle Investigator (co-PI). *Integrating patient preferences with evidence to improve decision making for prostate cancer treatment.* Patient-Centered Outcomes Research Institute (PCORI) ($1,768,432).

Co-Principle Investigator (co-PI). *Connecting US to Strengthen K-5 Mathematics Content*

and Pedagogy: A University/School Partnership. State of Maine Department of Education ($108,000).

SERVICE AND LEADERSHIP

Peer Reviewer - ACM SIGCSE TS 2024

Founder and Director of the *GeoGebra Institute of Maine*

Member of the Mathematical Association of America Committee on Technologies in Mathematics Education

Webmaster for the Northeast Section of the Mathematical Association of America

Chair - Mathematical Association of America (MAA) Northeast Sectional Meeting (Spring 2016)

PROFESSIONAL AFFILIATIONS

Association for Computing Machinery (ACM)

Mathematical Association of America (MAA)

HONORS AND AWARDS

Distinguished University Teaching Award, Mathematical Association of America Northeast Section, 2023

University Leadership Award: Club Advisor of the Year. UNE Math Club 2010

Nominee, Deborah & Franklin Tepper Haimo Award for Distinguished University Teaching

Recent Courses Taught

- Algorithms in Programming (COS 161)
- Discrete Mathematics II (COS 280)
- Numerical Analysis (COS 374/574)
- Programming Languages: Principles and Paradigms (COS 360)
- Design and Analysis of Algorithms (COS 485/582)
- Mathematics of Machine Learning (COS 470)
- Advanced Database Concepts, Cloud Computing, & Big Data
- Introduction to Database Design and Implementation
- Data Structures and Algorithms
- Applied Linear Algebra
- Programming I w/Python
- Programming II w/Python (Machine Learning & Natural Language Processing)
- Tech Stack (Shell-scripting, github, AWS)
- Data Science - Exploring Data with R