

# Tyler Skorczewski

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CONTACT INFORMATION	Department of Mathematics, Statistics, & Computer Science University of Wisconsin Stout Office: Jarvis Hall Science Wing 311 410 10th Ave E Menomonie, WI 54751	<i>Office Phone:</i> (715) 232- 5392 <i>Dept. Fax:</i> () - <i>E-mail:</i> skorczewskit@uwstout.edu
CITIZENSHIP	United States	
SCHOLARLY INTERESTS	My scholarly interests revolve around developing mathematics that can be used to understand problems arising in biological and industrial settings and incorporating insights gleaned from this work into an effective program of undergraduate applied mathematics education and research.	
EDUCATION	<b>University of California, Davis</b> , Davis, California, USA  Ph.D., Applied Mathematics, September 2010 Thesis Topic: <i>A computational fluid dynamics study of suction feeding fish using Chimera overset grids</i> Adviser: Professor Angela Cheer <b>University of Wisconsin Oshkosh</b> , Oshkosh, WI  B.S., Mathematics and Physics, May 2004 Thesis Topic: <i>Characterization of surface roughness through fractal dimension</i> Magna cum Laude	
ACADEMIC APPOINTMENTS	<b>Associate Professor</b> Department of Mathematics, Statistics, & Computer Science, University of Wisconsin Stout	<b>2021</b>
	<b>Assistant Professor</b> Department of Mathematics, Statistics, & Computer Science, University of Wisconsin Stout	<b>2017 to 2021</b>
	<b>Assistant Professor</b> Department of Mathematics & Statistics, Cornell College	<b>2014 to 2017</b>
	<b>Research Assistant Professor</b> Department of Mathematics, University of Utah	<b>2010 to 2014</b>
TEACHING EXPERIENCE	<b>University of Wisconsin Stout</b> Department of Mathematics, Statistics & Computer Science  <i>Faculty</i>	<b>2017 to present</b>  Courses: Math 123 Finite and Financial Math; Math 154 Calculus II for Engineers; Math 157 Calculus and Analytic Geometry II; Math 250 Differential Equations and Linear Algebra; Math 90 Intermediate Algebra (online); Math 275 Linear Algebra; Math 150 Calculus with Precalculus I; MSCS 496 Preparation for Industrial Careers in Mathematics; Math 153 Calculus I for Engineers; Math 158 Multivariable

Calculus; MSCS 446 Numerical Analysis; MSCS 791 Field Project in Industrial Mathematics; Math 156 Calculus and Analytic Geometry I; Stat 130 Elementary Statistics; Math 255 Differential Equations; MSCS 447 Numerical Analysis II, Math 196 Mathematical Modeling in the Environment; ME 352 Numerical Methods in Engineering; MSCS 351 Mathematical Modeling

### **Cornell College**

Department of Mathematics & Statistics

*Faculty*

**2014 to 2017**

Courses: MAT 221 Linear Algebra; MAT 119/120 Single Variable Calculus w precalculus; MAT 236 Differential Equations; MAT 317 Mathematical Modeling; MAT 122 Multivariable Calculus; MAT 361 Advanced Topics: Scientific Computation; MAT 121 Single Variable Calculus; STA 201 Statistical Methods; MAT 256 Mathematical Models in Biology; MAT 357 Preparations for Industrial Careers (PIC) Math; MAT 358 Partial Differential Equations

Implemented a redesigned Mathematics major curriculum including an innovative Culture Points program

Implemented a new Applied Mathematics minor

### **University of Utah**

Department of Mathematics

*Faculty*

**2010 to 2014**

Courses: Math 1320 Engineering Calculus II; Math 2250 Differential Equations and Linear Algebra; Math 1220 Calculus II

Involved in the development and implementation of new Engineering Math sequence/curriculum

### **University of California, Davis**

Department of Evolution and Ecology

*Teaching Assistant/Fellow*

**2009 to 2010**

Collaborative Learning at the Interface of Mathematics and Biology (CLIMB) Program

A one year research-training program in mathematical biology for UC Davis students in mathematical sciences or biology.

I assisted in the mentoring of several scholarship undergraduate students in learning the concepts behind mathematical modeling and analysis in different biological fields and helped them to formulate their own research project. Aided them in their pursuit of their research project: modeling the effects of kin recognition and supercolony formation in Argentine ants.

Department of Mathematics

*Associate Instructor*

**2009**

Course: MAT 21D Vector Analysis

*Teaching Assistant*

**2005 to 2009**

Courses: MAT 17A/17B/17C Calculus for Biology and Medicine; MAT 128A/B/C Undergraduate Numerical Analysis; MAT 228A/228B Graduate Numerical Solutions for Partial Differential Equations

Led discussion sections, held office hours, and graded papers and exams.

**University of Wisconsin Oshkosh**

Department of Physics

*Teaching Assistant*

**2003 to 2004**

Held office hours in support of all undergraduate physics classes

**INDUSTRY  
POSITIONS**

**Research & Engineering**

**2003 to 2004**

Kimberly-Clark Corporation  
Neenah, WI

Performed research in areas of sensor physics, surface physics, and fluid dynamics in porous media under the direction of senior research staff in the Analytical and Measurement Technologies and Mathematical Modeling departments with the goal of developing innovative consumer products.

**Software Engineer**

**2004 to 2005**

Epic Systems Corporation  
Madison, WI

Developed electronic medical record software focusing on scheduling and radiology departments.

**UG RESEARCH  
ADVISING**

**Ben DeViney**

**2013**

Ben worked on an REU during the Spring of 2013 concerning the fluid dynamics of suction feeding on multiple prey items. One journal article has been submit.

**Jake Lehman, Jordan Wolfe, & Brian Cristion**

**2014**

Jake, Jordan, and Brian used a markov chain approach to measure competitive balance in sports leagues in a way that allows comparisons across sports. This groups work was presented at the 2015 MAA Mathfest and the 2016 Midwest Sports Analytics Conference.

**Josh Lee**

**2015**

Josh explored the relationship between jaw kinematics of suction feeding fish and the resulting fluid flow patterns using a computational method called the immersed boundary method. This was part of the 2015 Cornell Institute for Summer Research.

**Sam Cieszynski**

**2016**

Sam created a model forest fires using cellular automata and analyzed his results using fractal geometry and statistical mechanics concepts as part of the 2016 Cornell Institute for Summer Research.

**Drew Klocke**

**2016**

Drew analyzed the relationship between the size of NCAA division I basketball conferences and the differences found among various intraconference rating and ranking schemes. Drew presented this work at the 2016 Midwest Sports Analytics Conference.

**Kasper Kittredge**

**2017**

Kas investigated learning models in youth archery including such varied approaches as descriptive/inferential statistics, differential equations, discrete dynamical systems and time series analysis. This work was presented at the Joint Math Meetings January 2018 in San Diego.

**Brandon Andersen**

**2018**

Brandon worked with me to develop a dynamic energy budget theory of turtle shell growth. This work was presented at the 2018 UW Stout STEM Festival and we published a journal article "A Dynamic Energy Budget Model of Ornate Box Turtle Shell Growth" in Spora: A Journal of Biomathematics.

- James Evans** **2019**  
 James used time-series analysis to examine political elections and devise a quantitative definition of a wave election. He presented this work at MAA Mathfest in Cincinnati 2019 and the 2019 McNair Scholars conference. He also published his work in the peer-reviewed UW Stout Journal of Student Research.
- Paul Schultz** **2020**  
 Paul worked with me to understand mathematical models of casting in fly fishing and simulate roll casts. Paul presented at the 2021 MAA Wisconsin section meeting.
- Jessica Lundberg** **2021**  
 Jessica performed k-cross validation of the different turtle shell growth models. Jessica presented at the 2021 MAA Wisconsin section meeting.
- Audrey Williams & Anna Hansen** **2022**  
 Audrey and Anna developed ODE models of kidney bean growth in cooperation with industry Chippewa Valley Bean. The duo presented their work at the NSF-funded LAKES REU community outreach event in August 2022 and at the 2023 National Council of Undergraduate Research Conference (NCUR).
- Noah Royce** **2022-23**  
 Noah investigated some of the theoretical validity of ODE models of kidney bean growth and extended existing models to incorporate temperature effects. Noah will present to state legislators at the 2023 Research in the Rotunda event in Madison, WI and at the 2023 National Council of Undergraduate Research Conference (NCUR).
- JOURNAL ARTICLES
- Skorczewski, T., Cheer, A., Cheung, S., Wainwright, P.: Use of computational fluid dynamics to study forces on prey by aquatic suction feeders. *Journal of the Royal Society Interface* (2009).
- Skorczewski, T., Cheer, A., Wainwright, P.: The benefits of planar circular mouths on suction feeding performance. *Journal of the Royal Society Interface* (2012).
- Skorczewski, T., Crowl, L., Fogelson, A.L.: Platelet motion near a vessel wall or thrombus surface in 2D whole blood simulations. *Biophysical Journal* (2013).
- Skorczewski, T., Griffith, B., Fogelson, A.L.: Multi-bond models of platelet adhesion and cohesion. *Biological Fluid Dynamics: Modeling, Computations, and Applications*. AMS Contemporary Mathematics Series (2014).
- Van Wassenbergh, S., Day, S.W., Hernandez, L.P., Higham, T.E., Skorczewski, T.: Suction power output and the inertial cost of accelerating the neurocranium to generate suction in fish. *Journal of Theoretical Biology*. (2015).
- Walton, B.L., Lehmann, M., Skorczewski, T., Beckman, J.D., Holle, L.A., Cribb, J.A., Mooberry, M.J., Wufsus, A.R., Cooley, B.C., Homeister, J.W., Falvo, M.R., Fogelson, A.L., Neeves, K.B., Wolberg, A.S. Elevated hematocrit promotes arterial thrombosis. *Blood* (2017).
- Bernstein, N.P., Todd, R., Baloch, M.Y., McCollum, A., Skorczewski, T., Mickael, K.A., Eastham, J.E.M. Morphometric Models of Growth in Ornate Box Turtles (*Terrapene ornata ornata*) as Related to Growth Rings. *Chelonian Conservation and Biology* (2018).
- Skorczewski, T. Modeling Learning in Youth Archery. *Mathematical Gazette* (2020).
- Skorczewski, T., Andersen, B. A Dynamic Energy Budget Model of Ornate Box Turtle Shell Growth. *Spora: A Journal of Biomathematics* (2021).
- Skorczewski, T., Nicholes, J. Writing to Engage in Multivariate Calculus: Students' Perceptions of Math, Writing, and the Curriculum. *Across the Disciplines* (in review).

CONFERENCE PROCEEDINGS      Skorczewski, T., Richard, G., Proctor, W., Shen, C., Wang, M., Zhang, J., Zhong, P., Smith, R., Massad, J.: Design of rf mems switches without pull-in instability. In: Proceedings of SPIE, Smart Structures and Materials. San Diego, CA (2010).

TECHNICAL REPORTS      Skorczewski, T., Richard, G., Proctor, W., Shen, C., Wang, M., Zhang, J., Zhong, P., Smith, R., Massad, J.: Design of rf mems switches without pull-in instability. IMSM Workshop, North Carolina State University. (2009).

   Hendriks, F., Rubin, K., Cargill, D., Fehribach, J., Lin, T-S., Please, C., Raymond, C., Schwendeman, D., Skorczewski, T., Tilley, B., Witelski, T., Wrobel J., Wang, J., Zhang, S.: Homogenization of the equations governing the flow between a slider bearing and a rough spinning disk. Mathematical Problems in Industry, University of Delaware. (2009).

   Subbarayappa, D.A., Johnson, D., Skorczewski, T., Hibdon, J., Lin, T-S., Cargill, D., Cummings, L. Bistable nematic liquid crystal devices. GSMMC, Rensselaer Polytechnic Institute. (2009).

GRANTS & FUNDED AWARDS      SIAM Travel Award to present at ICIAM Conference in Tokyo (2023)

   UW Stout Chancellor’s Fund for Excellence to present at ICIAM Conference in Tokyo (2023)

   Wisconsin Fresh Water Collaborative grant “Predicting Dry Bean Yield Dependent Upon Water Input and Soil Type” (2022)

   Wisconsin Fresh Water Collaborative grant “Building water projects into an environmental math course” (2022)

   UW Stout NTLC SOTL funding (2022)

   NSF/MAA PIC (Preparation for Industrial Careers) (2018)

   UW Stout First Year Program funding (2018)

   UW Stout Start-up funds (2017)

   Associated Colleges of the Midwest Seminars in Advanced Interdisciplinary Learning (ACM SAIL) (2017)

   Leadership team for ACM FaCE grant “Engaging the Community of Mathematicians” (\$17,600) (2017)

   Cornell College Institute for Summer Research (2017)

   NSF/MAA PIC (Preparation for Industrial Careers) (2016)

   Cornell College Institute for Summer Research (2016)

   NSF Travel award to present at Computational Biofluids in Physiology Conference (2015)

   Cornell College Institute for Summer Research (2015)

   Cornell College course development funds for Scientific Computing (2015)

   MAA Project NExT (2014-2015)

   University of Utah Marriott Library Open Access Publishing Fund (2013)

   University of Utah NSF VIGRE REU support for Ben DeViney (2013)

   Travel award NIMBioS Workshop on blood clotting (2013)

   Member of NIMBioS Working Group on suction feeding mechanics (2012-2013)

University of Utah Center for High Performance Computing allocation (2012-2013,2013-2014)

University of Utah Center for High Performance Computing quick allocation (2012)

University of California Davis minigrant for SIAM Student Research Conference (2008,2009)

Society of Industrial and Applied Mathematics student group award (2007,2008)

REFEREE  
SERVICE

Journal of Theoretical Biology

Integrative and Comparative Biology

Journal of Computational Methods in Sciences and Engineering

UNIVERSITY/  
COLLEGE  
SERVICE

**Comprehensive Academic Plan Committee**

UW Stout 2022-

**Employee Retention Committee**

UW Stout 2022-

**Strategic Planning Committee**

UW Stout 2022-

**Program Review Committee**

UW Stout 2022-

**Educational Activities Committee**

UW Stout 2018-2021

Chair 2019-2021

**Faculty Senate Executive Committee**

UW Stout 2019-2021

**McNair Scholars program mentor**

UW Stout 2019

Mentor for diverse undergraduate students seeking graduate school.

**Colloquium Committee**

UW Stout 2017-2018,2022-2023

Organized talks for the MSCS department

**Rise Up program mentor**

Cornell College 2016-2017

Mentor for first-generation college students from diverse backgrounds.

**Academic Affairs Committee**

Cornell College 2015-2017

**STEM Fair coordinator**

Cedar Rapids Public Library/Kirkwood Regional Center 2015-2017

Organized students and faculty to represent Cornell College at the Cedar Rapids Public Library STEM Fairs in 2015 and 2016.

**Problem of the Block Contest Organizer**

Cornell College. 2014-2017

Organized and administered the Problem of the Block contest in the Department of Mathematics & Statistics at Cornell College.

### **Math Club Advisor**

Cornell College. 2014-present  
Organized and advised the Math Club at Cornell College.

### **L<sup>A</sup>T<sub>E</sub>X Workshop**

Cornell College. 2014  
Led a workshop to introduce students to L<sup>A</sup>T<sub>E</sub>X, a mathematical typesetting language.

### **Calculus Carnival**

University of Utah, 2012,2013  
This math department event is held every semester and uses games such as Math Jeopardy and Calculus Pictionary to teach calculus and precalculus concepts.

### **Maple and Matlab Introductory Sessions**

University of Utah, 2010,2012  
Organized and taught workshops introducing undergraduate students to Maple and Matlab software.

### **SIAM Club Executive Chairman**

University of California, Davis, 2007–2009  
Chaired the five member executive committee for the Society of Industrial and Applied Mathematics (SIAM) club at UC Davis which promotes applied mathematics throughout the UC Davis campus and provides a forum for students interested in applied mathematics. Organized the first and second annual Davis SIAM Student Research Conferences which highlight the cutting edge applied mathematics research being performed by students at UC Davis and included several keynote addresses. Successfully orchestrated SIAM funding grant and NSF VIGRE grant proposals to fund projects.

### **OTHER SERVICE**

#### **Judge**

SIAM M<sup>3</sup> Contest (2017)  
JMM Undergraduate Poster Competition (2015)  
Salt Lake Valley Regional Science and Engineering Fair (2011-2014)  
Eastern Iowa Science and Engineering Fair (2016)

#### **Mathematics Volunteer**

Wasatch Elementary School, Salt Lake City, UT (2010-2012)

### **SELECTED TALKS AND PRESENTATIONS**

*Crop per drop: using ODE models to find relationships between irrigation practices and kidney bean yield* Joint Mathematics Meetings, San Francisco, CA, January 6, 2024.

*ODE models relating irrigation to kidney bean yield* International Congress on Industrial and Applied Mathematics, Tokyo, Japan, August 23, 2023.

*Deer hunting as a best choice problem: finding math in unexpected places* UW Stout MSCS Department Colloquium, November 16, 2022.

*Using writing to engage students in a multivariable calculus course*, MAA Wisconsin Section Meeting, Virtual, April 1, 2022.

*A biologist asked a mathematician a question . . . and now NASA can better design submarines*, Festival of Scientific Computing, UW Stout, October 11, 2019.

*Modeling ornate box turtle shell growth*, MAA Mathfest, Cincinnati, OH, August 2, 2019.

*Modeling Learning in Youth Archery*, UW Stout MSCS Department Colloquium, October 19, 2018.

*A dynamic energy budget model of ornate box turtle shell growth*, MAA Mathfest, Denver, CO, August 3, 2018.

*Sports Analytics in Youth Archery*, MAA Wisconsin Section Meeting, Eau Claire, WI, April 6, 2018.

*Exploring how students learn in youth archery*, Joint Math Meetings, San Diego, January 11, 2018.

*Mathematical models in blood clotting*, UW Oshkosh Math Department Colloquium, November 10, 2017; Cornell College Colloquium April 4, 2018; UW Stout MSCS Department Colloquium April 20, 2018.

*Mathematical models of learning in youth archery*, Coe College Colloquium Series, January 24, 2017.

*Modeling learning in youth archery*, Joint Math Meetings, Atlanta, January 6, 2017.

*Growth Rate of Ornate Box Turtles in East-Central Iowa*, IAAS, 2016.

*A New Way to Measure Competitive Balance Across Sports Leagues*, MAA Mathfest, Washington DC, August 6, 2015.

*Multibond models of platelet adhesion*, Computational Biofluids in Physiology, University of Utah, Salt Lake City, May 14-15, 2015.

*Toward an integrative model of suction feeding using the immersed boundary method*, Mathematical Biology Seminar, University of Iowa, May 4, 2015.

*The math and science of suction feeding*, Cornell College, February 25, 2015.

*Toward an integrative model of suction feeding using the immersed boundary method*, 2014 Iowa MAA Meeting, Clarke University, October 24, 2014.

*Multibond models of platelet adhesion*, Joint Math Meetings, Baltimore, MD, January 10, 2014.

*Investigating suction feeding using the immersed boundary method*, NIMBioS, Knoxville, TN, May 21, 2013.

*Investigating blood clotting using the immersed boundary method*, University of Wisconsin LaCrosse, February 6, 2013.

*Design of RF MEMS switches without pull-in instability*, Davis SIAM Student Research Conference, Davis, CA, May 8, 2010.

*Design of RF MEMS switches without pull-in instability*, SPIE Smart Structures, San Diego, CA, March 10, 2010.

*Using computational fluid dynamics to study fish suction feeding*, Merck Pharmaceuticals, West Point, PA, February 25, 2010.

*Using computational fluid dynamics to study fish suction feeding and the design of RF MEMS switches*, Sandia National Labs, February 9, 2010.

*Homogenization of the Equations Governing the Flow Between a Slider and a Rough Spinning Disk*, MPI 2009, University of Delaware, June 19, 2009.

*Bistable liquid crystal display design*, GSMMC, Rensselaer Polytechnic Institute, June 12, 2009.

*Unsteady computational fluid dynamics of fish suction feeding on stationary prey*, Society of Integrative and Comparative Biology Annual Meeting, San Antonio, January 6, 2008.

*Characterization of surface roughness through fractal dimension*, Physics Seminar, University of Wisconsin Oshkosh, April 21, 2004.



*Relating fractal dimension of surface roughness to manufacturing processes*, Kimberly-Clark, Neenah, WI, January 8, 2004.

*Validation of absorbency finite element analysis in 3 dimensions*, Kimberly-Clark, Neenah, WI, August 12, 2003.

*Calibration and uses of flexible arrays of capacitance based pressure sensors*, Kimberly-Clark, Neenah, WI, May 23, 2003.