# Tyler Skorczewski


**Contact Information**

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**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**

**University of California, Davis**, Davis, California, USA

Ph.D., Applied Mathematics, September 2010

Thesis Topic: *A computational fluid dynamics study of suction feeding fish using Chimera overset grids*
Adviser: Professor Angela Cheer

**University of Wisconsin Oshkosh**, Oshkosh, WI

B.S., Mathematics and Physics, May 2004

Thesis Topic: *Characterization of surface roughness through fractal dimension*
Magna cum Laude

**Academic Appointments**

**Assistant Professor** **2017**
Department of Mathematics, Statistics, & Computer Science,
University of Wisconsin Stout

**Assistant Professor** **2014 to 2017**
Department of Mathematics & Statistics,
Cornell College

**Research Assistant Professor** **2010 to 2014**
Department of Mathematics,
University of Utah

**Teaching Experience**

**University of Wisconsin Stout**
Department of Mathematics, Statistics & Computer Science

*Faculty* **2017 to present**

Courses: Math 123 Finite and Financial Math; Math 154 Calculus II

**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

Organized courses, lessons, activities, exams and oversaw all administrative responsibilities
Implemented a resigned Math major curriculum including an innovative Culture Points program
Implemented a new Applied Math minor

**University of Utah**
Department of Mathematics

*Instructor* **2010 to 2014**

Courses: Math 1320 Engineering Calculus II; Math 2250 Differential Equations and Linear Algebra (× 2); Math 1220 Calculus II
Organized courses, lectures, exams and oversaw all administrative responsibilities including teaching assistants
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* **Summer Session II 2009**

MAT 21D: Vector Analysis
Organized course, gave lectures and exams, held office hours and oversaw all administrative responsibilities

*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

**Software Engineer** **2004 to 2005**

Epic Systems Corporation
Madison, WI

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

## Industry Positions

**Research/Scientist Intern** **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.

## UG Research Advising

**Ben DeViney** **2013**

Ben worked on an REU during the Spring of 2013 concering the fluid dynamics of suction feeding on multiple prey items. This work has produced one journal article thus far.

**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.

**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/inferntial statistics, differential equations, discrete dynamical systems and time series analysis. This work was presented at the Joint Math Meetings January 2018 in San Diego.

## 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).

DeViney, B., Skorczewski, T.: Suction feeding on multiple prey. J Roy Soc Interface (submitted).

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 (submitted - in revision)

## 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

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 Mariott 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

## University/ College Service

**Colloquium Committee**
UW Stout 2017-2018
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-present

**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-present
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.

**LaTeX Workshop**
Cornell College. 2014
Led a workshop tointroduce students to LaTeX, 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 $M^3$ 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)

## Awards and Honors

**Robert F. Witte Project NExT Fellow**

Mathematical Association of America (MAA) (2014-2015)

**Exceptional Service Award**

Society of Industrial and Applied Mathematics (SIAM) (2009)

**Harvey McKensie Math Award**

Department of Mathematics, UW Oshkosh (2004)

**Knop Physics Scholar**

Ripon College, Ripon, WI (2000-2001)

**Hornigold Science Award**

Lincoln High School, Wisconsin Rapids, WI (2000)

## Selected Talks and Presentations

*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.

*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*, Univeristy 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 capacititance based pressure sensors*, Kimberly-Clark, Neenah, WI, May 23, 2003.