Mike Soltys, Ph.D, E.I.T.

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Engineering provides a pathway for students to develop design-thinking skills that enable them to succeed in a wide range of careers and gives the tools necessary for them to solve the grand challenges that face our world. I believe I can have a tremendous impact on our society by leading our college in providing the highest quality designed-based engineering education.

Education

Dec 2013 | **University of Colorado**, Boulder
Ph.D. in Civil Engineering, Fluid Dynamics — GPA: 3.91
Thesis: "Experimental Investigations on the Role of Structure in Turbulent Mixing of Initially Isolated Scalars" — Advisor: Prof. John Crimaldi
| Dissertation Excellence Award

Dec 2006 | **Clemson University**
Bachelors in Civil Engineering — GPA: 3.95
Emphasis: Applied Fluid Mechanics — *summa cum laude*

Positions

Current / Aug 2020 | Senior Instructor at University of Colorado, Boulder
Engineering Plus
Designed and taught hands-on, active learning curriculum in classes ranging from 9 to 96 students. Courses taught included First-Year Projects, Engineering for the Community, Statics, Thermodynamics, and Engineering Explorations thru Physics. Acknowledged as a top teaching performer in college for over two years.

July 2020 / Aug 2014 | Instructor at University of Colorado, Boulder
Engineering Plus
| FCQ summary

Current / June 2014 | Co-Principal Investigator
TeachEngineering.org — *University of Colorado*
TeachEngineering provides free hands-on engineering curriculum for K12 educators. I helped lead new initiatives that have grown TE by 37% YoY, as well as receive over $4 million in grants over my time as Co-PI
| NSF #144495

Jul 2014 – Jan 2014 | Professional Research Assistant
TeachEngineering Digital Library — *University of Colorado*
Developed curriculum and aligned existing curriculum to Common Core State Standards. Augmented existing curriculum when possible to meet learning objectives in CCSS.

Dec 2013 – Jun 2011 | NSF Graduate Teaching Fellow
University of Colorado, Boulder
Developed and taught hands-on engineering curricula for 9^{th}-12^{th} grade students. Performed engineering and science outreach activities targeting under-represented groups.

Dec 2013 – Aug 2007 | Research Graduate Student and Lab Manager
Environmental Fluid Mechanics Laboratory — *University of Colorado*
Designed a new experimental technique for studying interactions between multiple scalars in turbulent aqueous flows using laser-induced fluorescence. Manufactured experimental apparatuses including laser optics and machine vision systems. Developed data analysis and image processing algorithms using MATLAB and R.

Dec 2012 – Aug 2012 | Lecturer at University of Colorado, Boulder
Civil Engineering
Taught hydraulic engineering for a class of 96 students, focusing on design applications of fluid dynamics related to water resources engineering.

Sept 2006 – May 2006 | Undergraduate Research Assistant
Clemson University Wind Load Test Facility — *Clemson University*
Constructed scale models and used them to gather structural loading data in a wind tunnel. Visualized flow using smoke machines. Acquired structural loading data through destructive testing in the field.

Aug 2005 – Jan 2004 | Engineer Diver
Collins Engineers, Inc. — *Charleston, SC*
Performed more than 125 underwater inspections using SCUBA diving techniques. Wrote structural inspection reports, including AutoCAD drawings.

Honors & Awards

2018 College of Engineering and Applied Science Top 20 Teaching Performers
2017 College of Engineering and Applied Science Top 20 Teaching Performers
2015 Winner: QuickLeft Where Are Your Wearables Hackathon
2014 Top 1% of data analysts on data science site kaggle.com
2013 Department of Civil, Environmental, and Architectural Engineering Dissertation Excellence Award

Grants & Fellowships

Aug. 2019	TeachEngineering: Democratizing Engineering Education for PK-12 Teachers J. Sullivan (PI), M. Soltys (PI), M. Zarske (Co-PI) *NSF award #1941701* *$3,200,000*
Mar. 2018	TeachEngineering Digital Library YouTube Video Production M. Soltys (PI) *EEF* *$3,000*
Oct. 2017	Raspberry Pi: Low Cost Computing for e+ Design Courses and ITLL Checkout M. Soltys (PI) *EEF* *$2,000*
Mar. 2016	Additional Laptops for Active Learning in Any Classroom M. Soltys (PI) *EEF* *$2,860*
Sept. 2015	TeachEngineering: Expanding & Sustaining Curriculum Access for K-12 Teachers J. Sullivan (PI), M. Soltys (Co-PI), M. Zarske (Co-PI) *NSF award #1544495* *$900,556*
Oct. 2014	Laboratory Equipment, Sensors and Measurement Tools to Enhance Hands-On and Design-Based Courses in the General Engineering Plus Degree Program. M. Soltys (PI), D. Reamon (PI) *EEF* *$3,000*
Dec. 2011 Aug. 2007	Departmental Graduate Student Fellowship M. Soltys *Civil, Environmental, and Architectural Engineering*

Publications

Google Scholar

[1] M. Zarske and **M. Soltys**. Engagement in Practice: Practicing Empathy in Engineering for the Community Course. In *ASEE Annual Conference and Exposition, Montreal*, 2020.

[2] S. Hug and **M. Soltys**. Engineering Outreach: Ambassador Girls Empowering Girls in the Field. In *ASEE Annual Conference and Exposition, Montreal*, 2020.

[3] R. Reitsma, J. Sullivan, and **M. Soltys**. TK-12 Engineering and the Next Generation Science Standards: a Network Visualization and Analysis. In *ASEE Annual Conference and Exposition, Montreal*, 2020.

[4] **Soltys, M. A.** and J. P. Crimaldi. Joint probabilities and mixing of isolated scalars emitted from parallel jets. *J. Fluid Mech*, 769:130–153, 2015.

[5] C. Samson, J. Sullivan, **M. Soltys**, and R. Reitsma. The Relevance of K-12 Engineering Curricula to NGSS: An Analysis of TeachEngineeringNGSS Alignments. In *ASEE Annual Conference and Exposition, Seattle, Washington*, 2015.

[6] **Soltys, M. A.** and J. P. Crimaldi. Special Issue Cover Image: The role of structured stirring and mixing on gamete dispersal and aggregation in broadcast spawning. *Journal of Experimental Biology*, 215(6):Cover, 2012.

[7] **Soltys, M. A.** and J. P. Crimaldi. Scalar interactions between parallel jets measured using a two-channel PLIF technique. *Experiments in Fluids*, 50(6):1625–1632, 2011.

Presentations & Workshops

[1] **Mike A. Soltys**, Dua Chalker, and Jackie Sullivan. Transforming the role of engineering in science education: A demonstration, conversation and action plan. In *NSF EEC Washington, DC*, 2019.

[2] **Mike A. Soltys** and Mindy Zarske. Using teachengineering to bring design thinking and ngss engineering standards into your classroom. In *ASEE PCEE Tampa*, 2019.

[3] **Mike A. Soltys** and Janet Tsai. Incorporating active learning into first year engineering project courses. In *ACTIVE Faculty Development and Leadership Intensive*, 2018.

[4] Farrokh Shoaei, **Mike A. Soltys**, Aaron True, and John Crimaldi. The Effect Of Obstacle Wakes On Reaction Enhancement Between Two Initially Distant Scalars. In *APS Division of Fluid Dynamics Gallery of Fluid Motion*, 2014.

[5] **Mike A. Soltys** and John P. Crimaldi. Turbulent generation of scalar covariance between two initially distant scalars: Implications for enhanced mixing and reaction. Annual Meeting of the APS Division of Fluid Dynamics, Pittsburgh, PA, November 25, 2013.

[6] **Mike A. Soltys**. The effect of structured stirring and mixing on scalar covariance of initially distant scalars. Dynamical and Chaotic Systems Seminar, Boulder, CO, September 5, 2013.

[7] **Mike A. Soltys**. Interactions between isolated scalars in turbulent flows. Boulder Fluid Dynamics Seminar, Boulder, CO, June 25, 2013.

[8] **Mike A. Soltys**. Joint probabilities of two scalars emitted from parallel jets using planar laser induced fluorescence. University of Colorado Water Resources Seminar, Boulder, CO, December 12, 2012.

[9] **Mike A. Soltys** and John P. Crimaldi. Interactions between turbulent mixing and coral reproduction. TOS/ASLO/AGU 2012 Ocean Sciences Meeting. Salt Lake City, UT, February, 2012.

[10] **Mike A. Soltys**. Turbulence, lasers, and coral sex: What turbulence can teach us about broadcast spawning (and visa versa). Fluids Connections. Boulder, CO, October 10th, 2010.

[11] **Mike A. Soltys**. Laser induced fluorescence. Fluids Connections. Boulder, CO, October 27, 2009.

[12] John P. Crimaldi and **Mike A. Soltys**. A two-color planar laser induced fluorescence technique for two-scalar mixing and reaction experiments. Turbulence, Heat and Mass Transfer 6, Rome, IT, September 14, 2009.

[13] **Mike A. Soltys**. Environmental fluid mechanics. University of Colorado Water Resources Seminar, Boulder, CO, November 12, 2008.

Service & Leadership

Current – 2018 | **NAE EngineerGirl Steering Committee**

Current – 2016 | **LA Program Department Liaison**

2019 | **Financial Futures Statics and Thermo Committee**

2017 | **CEAS Curriculum Committee**

2017 – 2014 | **New Faculty Orientation**
Participated in instructor portion of new faculty orientation for CEAS.

2016 | **PHYS 1140 Transformation Committee**

Aug 2018 – Aug 2015 | **All Souls Church of Boulder**
Served on church elder board. Planned and managed the budget, performed staff reviews, served on search committees for key personnel, and coordinated volunteer construction projects serving needy members of the community.

Outreach Activities

Apr 2019 **Admitted Student Day** Manned booth advertising engineering plus to admitted students

Jul 2018 **BOLD CAMPOS camp** Taught week-long design project for 50 rising 12th grade students

Jul 2017 **Goldshirt Physics/Math Summer Bridge** Designed and taught two-week physics and math component of Goldshirt Summer Bridge program.

Jul 2017 **BOLD CAMPOS camp** Taught week-long design project for 50 rising 12th grade students

Nov 2016	**Girls Explore Engineering Day** Presented Flash-talk to Girls interested in Engineering.
Jul 2016	**BOLD CAMPOS camp** Taught week-long design project for 50 rising 12th grade students.
Jul 2016	**I Have A Dream Design Camp** Organized and lead one-month design camp for 60 rising 9th grade students,
Apr 2016	**Admitted Students Day Open House** Participated in Admitted Students day Presentation
Feb 2016	**Boettcher Finalist Day** Presented recruitment materials to Boettcher Scholarship Finalists
Aug 2015	**Academic Expectations Session** Served on faculty panel addressing new CU students and parents.
Aug 2015	**Sparkfun Microntrollers for Education** Collaborated with Sparkfun Education in hands-on workshop on integrating microcontrollers into K12 classrooms.
Jun 2015	**EngiNEAR me** Designed and led one week hands-on design project for 40 high school seniors.
Apr 2015	**DSST Visit Day** led a hands-on activity and gave a presentation to recruit students to CU engineering.
Feb 2015	**Boettcher Finalist Day** Presented recruitment materials to Boettcher Finalists
Feb 2015	**Gold Shirt Panel** Participated in GoldShirt Faculty Panel answering questions for incoming GoldShirt Students.
Nov 2014	**Talented Scholars Day** led a hands-on activity and gave a presentation to recruit students to CU engineering.
May 2014	**Gates Expo Judge** Served as a judge for the Graland's Gates Invention and Innovation Competition.
Mar 2014	**DSST Visit Day** led a hands-on activity and gave a presentation to recruit students to CU engineering.
Feb 2014	**DSST-Green Valley Ranch/CU-Boulder STEM Visit** led a hands-on activity and gave a presentation to recruit students to CU engineering.
July 2013	**Goldshirt and Aspire summer bridge** Helped plan and implement new design project: SARA walkers for Goldshirt and Aspire summer bridge

Undergraduate Students Mentored

TeachEngineering Video Project

- Alissa Mastronardi (2017-2019)
- Nahum Tariku (2017-2019)
- Fernanda Villalobos (2018-2019)
- Colin Soguero (2019)
- Conner Mcleod (2019)
- Sarah Macdonald (2019)
- Erin Ruby (2019)
- Amelia Wigton (2019)

- Jack Marty (2019)
- Joshua Sun (2019)
- Patrick Gibbs (2017-2018)
- Annabel Lee (2017-2018)
- Alex Carrasco (2018)
- Cadence Speelman (2018)
- Grant Lewis Stewart (2018)
- Millicent Gabriel (2017)
- John Roach (2017)

Independent Studies

- Krish Desai (2017)

You'RE@CU mentoring program

- Allie Banks (2011)

Personal Interests & Skills

Physical Computing (Arduino, RaspberryPI, C++, ATMEL microcontrollers, Circuits)
Product Development and Prototyping (Solidworks, OnShape, 3D Printing, Manufacturing)
Data Analysis (R, MATLAB, Python, LaTeX)
Web Development (HTML, Javascript, CSS)
Backcountry Skiing
Mountain and Road Cycling
Trail Running

Professional Organizations

American Society of Engineering Education
American Physical Society
American Society of Civil Engineers
Tau Beta Pi

Courses Developed

FCQ summary

- **GEEN 2851: Statics for Engineers**
- **GEEN 1010: Engineering Explorations Thru Physics**
- **GEEN 3852: Thermodynamics**

Other Courses Taught

FCQ summary

- **GEEN 1400: First-Year Projects**

- **GEEN 2400: Engineering Design For the Community**
- **CVEN 3323: Hydraulic Engineering**
- **MCEN 2023: Statics**

Term Course	Spr '20 GEEN1400	Spr '20 GEEN2400	Fal '20 GEEN1010	Fal '20 GEEN1400	Fal '20 GEEN3852
Responses / Enrolled	19 / 32	18 / 28	33 / 35	16 /27	41 / 42
Interact with other students in a respectful way.	4.95	5	4.73	4.75	4.73
Reflect on what I was learning.	4.53	4.78	4.03	4.44	4.29
Connect my learning to "real world" issues or life experiences.	4.79	4.83	4.3	4.56	4.56
Work and learn collaboratively with my classmates.	4.89	5	4.42	4.81	4.71
Contribute my ideas and thoughts.	4.79	4.83	4.94	4.44	4.15
Evaluate arguments, evidence, assumptions, and conclusions about key issues (be a critical thinker).	4.58	4.89	4.13	4.56	4.07
Connect, synthesize, and/or transform ideas into a new form (be a creative thinker).	4.74	4.83	4.19	4.81	4.02
Consider diverse perspectives (gender, political, ethnic, racial, etc.) during class or in assignments.	4.5	4.83	3.26	4.47	2.94
Median of Course Related Questions	**4.77**	**4.83**	**4.25**	**4.56**	**4.22**
Demonstrated respect for diverse students and diverse points of view.	5	4.94	4.75	4.81	4.71
Challenged me to develop my own knowledge, comprehension, and conceptual understanding.	4.63	4.72	4.45	4.56	4.41
Gave projects, tests, or assignments that required original or creative thinking.	4.63	4.94	4.34	4.5	4.37
Provided opportunities for students to ask questions and initiate discussion.	4.79	4.94	4.73	4.81	4.61
Provided feedback on my work that helped me improve my performance.	4.74	4.83	3.73	4.75	4.24
Explained the grading criteria for assignments.	4.37	4.39	3.88	4.31	4.2
Was available to answer questions or provide assistance when needed.	4.95	4.94	4.58	4.88	4.63
Effectively used available technology to enhance learning.	4.63	4.94	4.79	4.63	4.63
Median of Instructor Related Questions	**4.69**	**4.94**	**4.52**	**4.69**	**4.51**

University of Colorado FCQ Summary

Term	Course	Returned / Enrolled	Course Overall	Instructor Overall	Hours/week (Incl Class)	Prior Interest	Instructor Effectiveness	Availability	Intellectual Challenge	How Much Learned	Instructor Respect
Fal 19	GEEN 1010	39 / 41	4.1	4.6		3.4	4.1	5.0	4.7	4.1	5.6
Fal 19	GEEN 2851	38 / 38	5.1	5.6		3.6	5.6	5.7	4.8	5.1	5.9
Fal 19	GEEN 3852	26 / 28	5.1	5.5		3.9	5.5	5.7	4.8	5.3	6.0
Spr 19	GEEN 1400	20 / 27	5.3	5.8		4.	5.6	5.8	4.5	5.1	5.8
Spr 19	GEEN 2400	23 / 25	5.6	5.9		4.9	5.9	5.8	4.9	5.4	5.9
Fal 18	GEEN 1010	30 / 41	4.7	5.4	7-9	4.0	5.1	5.2	5.2	4.7	5.7
Fal 18	GEEN 1400	17 / 30	5.8	5.8	7-9	5.2	5.7	5.6	4.7	5.3	5.8
Fal 18	GEEN 2851	34 / 41	4.9	5.4	7-9	3.3	5.4	5.6	4.9	5.0	6.0
Sum 18	GEEN 2851	11 / 15	5.1	5.5	13-15	4.0	5.3	5.6	4.5	5.2	6.0
Spr 18	GEEN 1400	18 / 26	5.7	5.9	7-9	5.0	5.8	5.8	4.7	5.6	5.9
Spr 18	GEEN 2400	23 / 30	5.1	5.8	10-12	4.8	5.7	5.5	4.3	4.8	6.0
Spr 18	GEEN 2851	27 / 32	5.3	5.9	7-9	4.2	5.8	5.8	4.7	5.3	6.0
Fal 17	GEEN 1010	41 / 41	4.3	5.0	10-12	4.4	4.8	5.4	4.9	4.7	5.6
Fal 17	GEEN 1400	27 / 30	5.2	5.4	7-9	4.8	5.2	5.1	4.5	4.7	5.9
Sum 17	GEEN 2851	21 / 23	5.8	6.0	10-12	4.2	5.9	5.9	4.9	5.5	6.0
Spr 17	GEEN 1400	26 / 32	5.6	6.0	7-9	4.6	5.9	5.8	4.9	5.5	6.0
Spr 17	GEEN 1400	22 / 33	5.5	5.9	7-9	4.5	5.8	5.7	4.4	5.2	6.0
Spr 17	GEEN 2851	28 / 41	5.0	5.7	7-9	4.3	5.5	5.4	4.9	5.1	6.0
Fal 16	COEN 1400	27 / 31	4.6	5.2	10-12	4.9	4.8	4.6	4.4	4.5	5.7
Fal 16	GEEN 1010	36 / 48	5.0	5.7	10-12	4.1	5.0	5.6	5.3	5.1	5.9
Sum 16	GEEN 2851	21 / 22	5.1	5.8	13-15	4.6	5.6	5.6	4.7	5.5	6.0
Spr 16	GEEN 1400	29 / 31	4.8	5.1	10-12	4.5	4.9	5.1	4.4	5.0	5.7
Spr 16	GEEN 1400	30 / 33	5.4	5.8	10-12	4.3	5.8	5.7	4.9	5.4	6.0
Spr 16	GEEN 2851	19 / 23	5.1	5.4	7-9	4.1	4.9	5.6	4.9	4.9	5.8
Fal 15	GEEN 1010	28 / 33	5.3	5.6	10-12	4.4	5.4	5.4	5.1	5.1	5.6
Fal 15	GEEN 1400	27 / 30	5.1	5.6	10-12	4.7	5.3	5.4	5.3	5.1	5.9
Sum 15	GEEN 2851	8 / 9	5.1	5.9	7-9	4.0	5.5	5.8	4.3	4.9	6.0
Spr 15	GEEN 1400	22 / 23	4.6	5.5	10-12	4.5	5.4	5.4	4.9	4.8	5.9
Spr 15	MCEN 2023	60 / 70	4.8	5.4	7-9	3.8	5.3	5.5	4.8	4.9	6.0
Fal 14	GEEN 1400	29 / 31	5.4	5.6	10-12	4.5	5.6	5.5	4.9	5.4	5.9
Fal 14	GEEN 1400	25 / 29	5.0	5.7	7-9	4.8	5.5	5.4	4.7	4.9	5.9
Fal 14	GEEN 2851	23 / 38	4.9	5.3	7-9	4.0	5.1	5.8	5.0	5.1	6.0
Spr 14	GEEN 1400	25 / 27	5.4	5.8	7-9	4.8	5.6	5.7	4.6	5.2	6.0
Fal 12	CVEN 3323	52 / 96	4.9	4.6	7-9	4.3	4.6	5.6	4.5	5.0	5.9