

## **AnnMarie Polsenberg Thomas, Ph.D.**

Professor of Engineering  
Professor of Entrepreneurship  
Director, Playful Learning Lab  
Co-Founder, UST Center for Engineering Education

University of St. Thomas  
Mail: Mail Code OSS 101  
St. Paul, MN 55105

apthomas@stthomas.edu  
<http://www.annmarie-thomas.com>  
(651) 263-9979

### **Education**

#### **Professional Certificate in Sustainable Design (12/2012)**

Minneapolis College of Art and Design, Minneapolis, MN

#### **Ph.D., Mechanical Engineering (8/2006)**

California Institute of Technology, Pasadena, CA

Thesis: *Explorations into Synthetic Jet Propulsion for Underwater Vehicles*

Advisors: Dr. Joel Burdick and Dr. John Dabiri

#### **M.S., Mechanical Engineering (6/2002)**

California Institute of Technology, Pasadena, CA

#### **S.B., Ocean Engineering with a minor in Music (6/2001)**

Massachusetts Institute of Technology (MIT), Cambridge, MA

Senior Project: *An Assessment of the PBD-MTFLOW Coupling: 3 Case Studies*

#### **Design Thinking Executive Education Bootcamp (7/2015)**

Stanford University, Palo Alto, CA.

### **Professional Experience**

University of St. Thomas, Saint Paul, MN

**Professor, Engineering (2018-Present)**

**Professor, Business (2018-Present)**

**Associate Professor, Business (9/2015- Present)**

**Associate Professor, Engineering (9/2012 – Present)**

**Assistant Professor, Engineering (9/2006 – 8/2012)**

**Co-Founder/Co-Director of the University of St. Thomas Center for Engineering Education (1/2009 – Present)**

**Director, Playful Learning Lab (2013- Present)**

Courses Taught:

- EGED530 ETLS 530/ENGR130 Fundamentals of Engineering for Educators (*F10, Sp11, F11, F14*)
- EGED531 Engineering Design (for PK-12 Educators) (*Su12, Sp14, Sp15, Sp16, Su16, Sp17, Sp18*)
- ENGR171 Engineering Graphics and Design

(F06, Sp07, F07, F08, Sp09, F09, Sp10, Sp11, F11, Sp12, F13, Sp 14, F14, S15, F16, F17, Sp18)

- ENGR288 Product Design: Toys (J10)
- ENGR320 Machine Design and Synthesis (F06, F07, F08, Sp09, F09, Sp10, Sp11)
- ENGR480/481 Senior Design (F06, Sp07, F07, Sp08, F13, Sp14)
- ENTR490 Environmental Sustainability and Innovation (Sp16, Sp17, Sp18)
- ENTR490 Technology Prototyping (F17)
- ENGR488 Dynamics with Circus Lab (J09)
- IDSC480 Brain-Machine Interfaces (co-taught) (F07, S09)
- IDSC480 Product Design for an Aging Population (co-taught) (F08)

**Disney Learning Consultant (2016-present)**

**Disney Imagicademy advisory panel (2014-2016)**

**Maker Education Initiative, Sebastopol, CA**  
**Executive Director/Founding Director (5/2012-4/2013)**

**Applied Minds, Inc., Glendale, CA**  
**Intern (7/2007)**  
*supervisor: Dr. Danny Hillis*

**California Institute of Technology, Pasadena, CA**  
**Teaching Assistant (1/2006 - 6/2006)**

**Art Center College of Design, Pasadena, CA**  
**Faculty (9/2004 - 6/2006)**

**Monterey Bay Aquarium Research Institute (MBARI), Moss Landing, CA**  
**Intern (6/2000 – 8/2000)**

**California Institute of Technology, Pasadena, CA**  
**Research Assistant (8/2001 - 8/2006)**

**Massachusetts Institute of Technology, Cambridge, MA**  
**Research Assistant (11/1997 - 6/2001)**  
**Teaching Assistant (9/1998 - 5/2001)**

### **Books (author)**

4. (2018). *A Wrinkle in Time Book of Fun, Facts, and Science*. Farrar Straus and Giroux.  
**AM Thomas is listed as the consultant, on the title page.**

3. **AM. Thomas**, K. Fontichiaro, S. Thomas. (2017) *Building Squishy Circuits (Makers as Innovators Junior)*. Cherry Lake Publishing.

2. **AM. Thomas**. (2014). *Making Makers: Kids, Tools, and the Future of Innovation*. Maker Media.

1. K. Fontichiaro, **AM. Thomas**. (2014) *Squishy Circuits*. Cherry Lake Publishing.

## **Book Chapters**

**2. AM. Thomas.** (2013). Preface. In Buechley, L., Peppler, K., and Eisenberg, M. (eds), *Textile Messages: Dispatches from the World of E-Textiles and Education*.

**1. AM. Thomas.** (2013). Squishy Circuits. In Honey, M. & Kanter, D. (eds), *Design, Make, Play: Growing the Next Generation of STEM Innovators*, pp. 119-137.

## **Peer-Reviewed Conference Proceedings**

*Undergraduate students are underlined.*

**26. E. Meuer, E. Kern, M. Andrews, A. Tenhoff, K. Andrews, P. Huschka, E. Ryan, L. Tozour, and **AM. Thomas.** (2017) Painting Pitches. Proceedings of the ASEE Annual Conference. Columbus, OH.**

**25. D. Besser, A. Haugh, **AM. Thomas**, and J. Laleman.** (2017) The Effect of Gender Groupings at an Engineering Summer Camp on Increasing Engineering Knowledge and Confidence. Proceedings of the ASEE Annual Conference. Columbus, OH.

**24. B. Kasper, A. Haugh, N. Kasper, B. Gunderson, **AM. Thomas**, and D. Besser.** (2016) Design, Implementation, and Assessment of an After-School Engineering Program for Deaf Students. Proceedings of the ASEE Annual Conference. New Orleans, LA.

**23. A. Haugh, O. Lang, **AM. Thomas**, D. Monson, and D. Besser.** (2016) Assessing the Effectiveness of an Engineering Summer Day Camp. Proceedings of the ASEE Annual Conference. New Orleans, LA.

**22. E. Koller, L. Van Beek, D. Besser, S. Selcen Guzey, and **AM. Thomas.**** (2015) Implementing and Evaluating An E-Textile Curriculum in an Engineering Summer Program for Girls. Proceedings of the ASEE Annual Conference. Seattle, WA.

**21. A. Zierden, B. Boyd, and **AM. Thomas.**** (2014) Science and Engineering Practices in Food Science and Chemistry. Proceedings of the ASEE North Midwest Regional Conference. Iowa City, IA.

**20. A. Lague, and **AM. Thomas.**** (2014) Stories to Inspire Very Young Engineers. Proceedings of the ASEE North Midwest Regional Conference. Iowa City, IA.

**19. B. Kasper, E. Koller, B. Gunderson, and **AM. Thomas.**** (2014) Creative Circuits with Deaf Students. Proceedings of the ASEE North Midwest Regional Conference. Iowa City, IA.

**18. M. Schmidtbauer, S. Johnson, J. Jalkio, and **AM. Thomas.**** (2012) Squishy Circuits as

a Tangible Interface. Proceedings of *Extended Abstracts of the ACM Conference on Computer Human Interactions*. New York, NY.

**17. A.M. Thomas**, J.B. Hansen, S.H. Cohn, and B.P. Jensen. (2011) Development and Assessment of an Engineering Course for In-Service and Pre-Service K-12 Teachers. *Proceedings of the ASEE National Conference*. Vancouver, BC.

**16. S. Johnson** and **A.M. Thomas**. (2011) Exchange: Using Squishy Circuit Technology in the Classroom. *Proceedings of the ASEE National Conference*. Vancouver, BC.

**15. A.M. Thomas** and J.B. Hansen. (2011) Certificate/Concentration in Engineering for P-12 Educators. *Proceedings of the ASEE National Conference*. Vancouver, BC.

**14. A.M. Thomas**, K. Berrier, and A. Guggenbuehl. (2011) Daring Young Engineers on the Flying Trapeze: Using Circus Arts to Teach Dynamics. *Proceedings of the ASEE National Conference*. Vancouver, BC.

**13. W. Besser** and **A.M. Thomas**. (2011) A Comparison of Design Education Across Two Fields: Lessons from Industrial Design and Mechanical Engineering. *Proceedings of the ASEE National Conference*. Vancouver, BC.

**12. W. Besser** and **A.M. Thomas**. (2011) Roles in the Design Process: A Survey of Engineering and Industrial Design Educators. *Proceedings of the ASEE National Conference*. Vancouver, BC.

**11. J.B. Hansen**, **A.M. Thomas**, and J. Wall. (2010) Teacher Competency in Engineering Education: A Professional Development Approach. *Proceedings of the P-12 Engineering and Design Education Research Summit*. Seaside, OR.

**10. B. Turek-Krengel**, S. Woelber, E. Johnson, and **A.M. Thomas**. (2010) Poster: Windmills in Trigonometry Class. *Proceedings of the ASEE National Conference*. Louisville, KY.

**9. J. Nesbitt** and **A.M. Thomas**. (2010) Bridging the Digital Divide One Tweet at a Time: Twitter- Enabled Devices for Family Communication. *Extended Abstracts of the ACM Conference on Computer Human Interactions*. Atlanta, GA.

**8. S. Johnson** and **A.M. Thomas**. (2010) Squishy Circuits: A Tangible Medium for Electronics Education. *Extended Abstracts of the ACM Conference on Computer Human Interactions*. Atlanta, GA.

**7. A.M. Thomas** and J.R. Prichard. (2008) Brain-Machine Interfaces: A Team-Taught Seminar Bridging Disciplines and Fostering Discussions. *Proceedings of the 2008 Frontiers in Education Conference*. Saratoga Springs, NY.

**6. A.M. Thomas** and J.R. Prichard. (2007) Design for an Aging Population: A Multi-

Disciplinary Design Retreat. *Proceedings of the ASEE 2007 North Midwest Sectional Conference*. Houghton, MI.

**5. A.M. Polsenberg Thomas** and M. Breitenberg. (2007) Engineering for Non-Engineers: Learning from Nature's Designs. *Proceedings of the American Society of Engineering Education Annual Conference*. Honolulu, HI.

**4. J. Abraham and A.M. Thomas**. (2007) Numerical Simulation of Induced Co-Flow and Laminar-to-Turbulent Transition Associated with Synthetic Jets. *Proceedings of Flucome 2007*. Tallahassee, FL.

**3. A.M. Polsenberg Thomas**, J. Burdick, and K. Mohseni. (2005) "An Experimental Study of Voice-Coil Driven Synthetic Jet Propulsion for Underwater Vehicles." *Proceedings of OCEANS 2005*. Washington, D.C.

*\*Please note that experimental force measurements in this paper are inconsistent with later experiments.*

**2. A.M. Polsenberg Thomas**, J. Dabiri, K. Mohseni, and J. Burdick. (2005) "An Experimental Investigation and Modeling of Voice-Coil Driven Synthetic Jet Propulsors for Underwater Vehicles." *Proceedings of the International Symposium on Unmanned Untethered Submersible Technology (UUST)*. Durham, NH.

*\*Please note that experimental force measurements in this paper are inconsistent with later experiments.*

**1. A.M. Polsenberg Thomas**, M. Milano, M. Grazier G'Sell, K. Fischer, and J. Burdick. (2005) "Synthetic Jet Propulsion for Small Underwater Vehicles." *Proceedings of the*

*\*Please note that experimental force measurements in this paper are inconsistent with later experiments.*

### **Conference Posters (without accompanying papers)**

*Undergraduate students and high school students are underlined.*

**2. A.T. Gatto**, M.A. Chalkley, and **A.M. Thomas**. (2009) As Parents Age: A Qualitative Examination of Communication in Healthy Families. Poster presented at the 21st Annual Meeting of the Association for Psychological Science. San Francisco, CA.

**1. A. Gatto**, S. Adkins, B. Falk, B. Dauwalter, **A.M. Thomas**, and M.A. Chalkley. (2008) An Investigation into the Usage and Design of Walkers. Presented at the 2008 Minnesota Gerontological Society Conference. Brooklyn Center, MN.

### **Peer-Reviewed Journal Publications**

**2. A.M. Thomas** and J. Abraham. (2010) Numerical Simulation of Circular Synthetic Jets with Asymmetric Forcing Profile. *Open Mechanical Engineering Journal*, 4, 1-7.

**1. J. Abraham and A.M. Thomas**. (2009) Induced Co-flow and Laminar-to-Turbulent Transition with Synthetic Jets. *Computers & Fluids*, 38, 1011-1017.

## Other Publications

*(Polsenberg is my maiden name)*

11. **AM. Thomas.** (2017) You Don't Need to Be Superwoman to Succeed in STEM. Chronicle of Higher Education, January 27, 2017.

10. **AM. Thomas.** (2016) Playing with Food. *Make*, 52.

9. **AM. Thomas.** (2014) What do I Make? *IEEE Computer* 47, 12.

8. **AM. Thomas.** (2014) [Why space tourism still deserves a chance](#) WIRED.com Opinion.

7. **AM.Thomas.** (2012) Engaging Students in the STEM Classroom Through Making. *Edutopia*. <http://www.edutopia.org/blog/stem-engagement-maker-movement-annmarie-thomas> .

6. **AM. Thomas.** (2013) Not Failure. *MAKE*: 31, pp. 17.

5. **AM. Thomas.** (2012) Real Tools for Kids. *MAKE*: 29. pp. 27.

4. S. Johnson and **A.M. Thomas.** (2010) 1+2+3: Sculpting Circuits. *MAKE*,22, pp. 78-79.

3. **A.M. Thomas** and J.B. Hansen. (2009) Engineering Literacy: Building Familiarity with Engineering in K-12 Schools. *Manufacturing Success*, Summer 2009 edition.

2. **A.M. Polsenberg**, J.E. Kerwin, and T.E. Taylor. (2000) A Manual for the Coupling of PBD-14 and DTNSAX: A Coupled Lifting-Surface Design/Analysis Program for Marine Propulsors. Technical report, MIT Department of Ocean Engineering. Cambridge, MN.

1. N. Hahn, **A.M. Polsenberg**, D.H. Renick, T.E. Taylor, and J.E. Kerwin. (2000) PBD-14.3: A Coupled Lifting-Surface Design/Analysis Program for Marine Propulsors. Technical Report, MIT Department of Ocean Engineering. Cambridge, MN.

## Honors and Awards

ASEE Northwest Regional Section Outstanding Young Educator (2010)

Design Distinction Award from ID Magazine (2009)

National Academy of Engineering/CASEE New Faculty Fellow Award (2008)

PEO National Scholar Award (2005)

National Defense Science and Engineering Graduate Fellowship (2001-2004)

Society for Naval Architects and Marine Engineers Undergraduate Honor Paper Prize (2001)

Society for Naval Architects and Marine Engineers Undergraduate Scholarship (2001)

## **Grants and Sponsorships**

Available upon request

## **Workshops and Presentations (partial listing)**

“Panel: The Materials of Making,” Scotts Valley, CA (2018)

“Playful Engineering: Making Engineering Fun,” Linkengineering Online Web Conference (2018)

“Building a Culture of Creativity and Collaboration to Spark Innovation,” Association of Collegiate Conference and Events Directors International annual conference, Minneapolis, MN (2018)

“Play in a Musical Sandbox- workshop,” TED Conference, Vancouver, Canada (2018)

“Creative Circuitry,” Humboldt County STEAM Conference, Eureka, CA (2018)

“Playing with STEAM,” opening Keynote, Humboldt County STEAM Conference, Eureka, CA (2018)

“Seeing Sound,” invited presentation at Hackers 2018, Santa Cruz, CA (2017)

“Making a Maker,” Windward Design + Maker Class Colloquium keynote, Los Angeles, CA (2017)

“Making Makers,” Design Make Classroom Colloquium, Los Angeles, LA (2017)

“Code+Chords: Teen Tech,” ASEE K-12 Workshop, Columbus, OH (2017)

“Circus Science” ASEE K-12 Workshop, Columbus, OH (2017)

“Squishy Circuits” ASEE K-12 Workshop, Columbus, OH (2017)

“Making Makers,” National Maker Faire, Washington, DC (2016)

“Playing to Learn,” Presentation to all St. Paul School District Science Teachers, St. Paul, MN (2016)

Keynote for the FIRST Women in Science and Technology Conference, Manchester, NH

(2016)

“Making Makers,” Talks @ Google, Mountain View, CA (2015)

“Making Makers,” Bay Area Maker Faire, San Mateo, CA (2015)

“Squishy Circuits,” BushCON, St. Paul, MN (2015)

“Squishy Circuits Workshop,” Northeast Kansas Library System’s Innovation Day, Topeka, KS (2015)

“Makerspaces workshop,” Northeast Kansas Library System’s Innovation Day, Topeka, KS (2015)

“Play and The Maker Movement,” keynote for Northeast Kansas Library System’s Innovation Day, Topeka, K (2015)

“Designing Bridges Between Disciplines: Lessons Learned from Unusual Collaborations,” Northwestern Siegel Design Institute, Evanston, IL (2015)

“The Maker Movement and Libraries,” Elbow Lake Library, Elbow Lake, MN (2015)

“Persistence,” ORDcamp, Chicago, IL (2015)

Keynote for the FIRST Women in Science and Technology Conference, Manchester, NH (2014)

“Playing to Learn: A Maker’s Perspective,” American Library Association LITA keynote, Albuquerque, NM (2014)

“Makers as Children, Children as Makers,” Disney, Burbank, CA (2014)

“The Maker Movement and STEAM,” Dramatic Results, Long Beach, CA (2014)

“Daydreams to Reality,” Stanford University, Palo Alto, CA (2014)

“The Maker Movement, Art, Science, and Squishy Circuits,” Art Center College of Design, Pasadena, CA (2013)

“The Maker Movement and Squishy Circuits,” Armory Center for the Arts Board Meeting, Pasadena, CA (2013)

“Maker and the Education Community” panel, presented by Atmel Corporation, New York City, NY (2013)

“Makers as Children, Children as Makers,” World Maker Fair, Queens, NY (2014)



“Workshop: Maker Training,” Girl Scouts of the USA, Edith Macy Conference Center, Briarcliff Manor, NY (2013)

“Broadening Participation in the Maker Community,” with K. Peppler, M. Resnick, and E. Eidman-Aadahl, Digital Media and Learning Conference, Chicago, IL (2013)

“The Maker Movement,” EdVenture Childrens’ Museum, Columbia, SC (2013)

“Workshops: Squishy Circuits and LED Pop-Up Cards,” EdVenture Childrens’ Museum, Columbia, SC (2013)

“Workshop: New Approaches to Engagement and Participation – Session 1: Maker Spaces in Museums and Libraries,” with M. Semmel, N. Beegan, L. Brahms, D. Kanter, D. Wells, and J. Watson, IMLS WebWise Conference, Baltimore, MD (2013)

Google Science Faire Google+ Hangout (2013)  
<<http://www.youtube.com/watch?v=GQy5ttVsWZQ>>

“The Maker Movement and Afterschool: Partners in Learning,” with V. Wegner, and L. Gillam, Nationwide Network of Statewide Afterschool Networks National Network Meeting, Washington, DC (2013)

“The Maker Movement,” Institute for Museum and Library Studies, Washington, DC (2013)

“Making Makers,” Innovation Starts Here event at the Works Museum, Bloomington, MN (2012).

“The Future of Higher Education,” panel moderator, Hackers conference, Santa Cruz, CA (2012).

“K-12 Education,” panelist, Hackers conference, Santa Cruz, CA (2012).

“Every Child a Maker,” MIT Media Lab, Cambridge, MA (2012)

“Every Child a Maker,” Tufts University, Medford, MA (2012)

Introductory Remarks, Making Meaning, New York Hall of Science, Queens, NY (2012).

“Every Child a Maker,” World Maker Faire, New York, NY (2012)  
[http://www.youtube.com/watch?v=L\\_xZpOacJK4](http://www.youtube.com/watch?v=L_xZpOacJK4)

“ReMaking Education,” with B. Corcoran, C. Shea, K. Cator, and P. Heckamn, San Mateo, CA (September 10, 2012).

“Squishy Circuits Workshop,” Making MAKESHOP workshop, Pittsburgh, PA (2012)

“The Maker Education Initiative,” Making MAKESHOP workshop, Pittsburgh, PA (2012)

“Making Tomorrow’s Makers,” with Dale Dougherty, 21<sup>st</sup> Century Community Learning Centers Summer Institute, New Orleans, LA (2012)

“Squishy Circuits,” Google+ MAKE summer camp (2012)  
<<http://www.youtube.com/watch?v=x6VHYpxeRnc&list=PLC2C889FD6ED158EA&index=33>>

“Serious Play Dough: Inspiring Young Circuit Designers,” Big Ideas Fest, Half Moon Bay, CA (2011) <<http://www.bigideasfest.org/content/serious-play-dough-inspiring-young-circuit-designers>>

“How are Makers Made?,” TEDxTC, Saint Paul, MN (2011)  
<<http://www.youtube.com/watch?v=vo5R8x6tyGg>>

“Making Tomorrow’s Makers,” World Maker Faire, New York, NY (2011)  
<[http://fora.tv/2011/09/18/AnnMarie\\_Polsenberg\\_Thomas\\_Making\\_Tomorrows\\_Makers](http://fora.tv/2011/09/18/AnnMarie_Polsenberg_Thomas_Making_Tomorrows_Makers)>

“Advanced Squishy Circuits,” MISF STEM Seminar Day, Saint Paul, MN (2011)

“Squishy Circuits,” Colloquium on P-12 STEM Education Research, Saint Paul, MN (2011)

“Playfully Engineering Education,” Monterey Bay Aquarium Research Institute, Monterey, CA (2011)

“Squishy Circuits,” TED-U, Long Beach, CA (2011)

“Squishy Circuits and Engineering for Educators,” MISF STEM day, Saint Paul, MN (2010)

“Why Making Matters,” TED-U, Long Beach, CA (2010)

“The Role of Engineering/Making in PK-12 Education,” FOO Camp, Sebastopol, CA (2009)

“The Importance of Fun In Engineering,” TED Conference, Long Beach, CA (2009)

“Engineering Design,” Farnsworth/Cleveland Aerospace School, Saint Paul, MN (2008)

“Brain Machine Interfaces: A Team-Taught Seminar Bridging Disciplines and Fostering Discussions,” FIE Conference, Saratoga Springs, NY (2008)

“The Engineering Design Process,” Johnson High School, Saint Paul, MN (2008)

“Creativity,” Science Museum of Minnesota, Minneapolis, MN (2008)

“The Engineering Design Process,” workshop for P-12 teachers and administrators, Saint Paul, MN (2007)

“Inspired by Nature: Underwater Robotics,” University of Minnesota Bio-Inspired Systems Class, Minneapolis, MN (2006)

“Propulsion Inspired by Jellyfish,” International Symposium for Biologically Inspired Design and Engineering, Atlanta, GA (2006)

“Creative Collaborations: Partnerships at the intersection of art, design and science” (panelist), Pasadena, CA (2005)

“Gobo Gobo: Thoughts on ‘Form of Forest, Color of Forest,’ and ‘La Mer,’” Pasadena Symphony, Pasadena, CA (2004)

“Following Nature’s Example,” Art Center College of Design Structure and Sensory Systems Class, Pasadena, CA (2004)

“Five Lessons Ocean Engineering Has Taught Me,” Marine Advanced Technology Education Center National ROV Contest, UC Santa Barbara, Santa Barbara, CA (2004)

“Robots at Work and Play,” Tech Museum of Innovation, San Jose, CA (2004)

**Art Exhibitions Participated In**

“Here by Design 3,” University of Minnesota, Minneapolis, MN (10/2007-1/2008)

“AxS: At the Intersection of Art & Science,” Armory Ctr. for the Arts, Pasadena, CA (6/2006-9/2005)

“ear(th),” Williamson Gallery, Pasadena, CA (9/2004-12/2004)

**University Service (partial listing)**

Dean of Education search committee (2017-18)

Core Curriculum Committee (2014-Present)

President’s Strategic Planning Committee (2014)

Faculty Search Committee (Engineering 2014,2013, 2010, 2008, Physics 2007)

Educational Planning and Policies Committee + Graduate Curriculum Committee  
(9/2009 – 5/2012)

2010 Winchell Conference Planning Committee (9/2009 - Present)

Aquinas Scholars Advisory Board (9/2008 - Present)

Student Life Committee (9/2006 - 10/2009)

Undergraduate Collaborative Research Committee (9/2006 - 6/2008)

Dean Search Committee (Engineering 2007)

Staff Search Committee (Engineering Lab Manager 2007, chair 2008)