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## Shawna Thomas

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### Education

- Ph.D. in Computer Science**, Texas A&M University, College Station, TX 1/02 – 5/10  
Advisor: Nancy M. Amato.  
Research Focus: Robotic motion planning algorithms and their application to biology problems such as protein folding and RNA folding.
- B.S. in Computer Engineering**, Texas A&M University, College Station, TX 8/98 – 12/01  
3.97/4.00 GPA. Summa Cum Laude. University Undergraduate Research Fellow with Senior Honors Thesis.

### Professional Experience

#### Instructional Associate Professor

*Department of Computer Science and Engineering, Texas A&M University* 8/24 – Present  
Teaching various courses in Computer Science within the Department of Computer Science and Engineering. Developing course material, giving lectures, and assessing student learning through various types of assignments. Courses include CSCE 120: Program Design and Concepts (Regular, Honors) CSCE 331: Foundations of Software Engineering (Regular, Honors), and CSCE 482: Senior Capstone Design (Regular).

#### Instructional Assistant Professor

*Department of Computer Science and Engineering, Texas A&M University* 8/19 – 8/24  
Teaching various courses in Computer Science within the Department of Computer Science and Engineering. Developing course material, giving lectures, and assessing student learning through various types of assignments. Courses include CSCE 315: Programming Studio (Regular, Stacked Honors, and Study Abroad), CSCE 411: Design and Analysis of Algorithms (Regular and Study Abroad), CSCE 482: Senior Capstone Design (Regular and Stacked Honors), and CSCE 491: Research (Honors).

#### Undergraduate Advisor

*Department of Computer Science and Engineering, Texas A&M University* 8/21 – Present  
Providing faculty leadership of the undergraduate advising team, creating new advising processes and revising existing ones to operate at scale given the increasing numbers of undergraduate students in department programs, and serving as a liaison between the advising office and the department's undergraduate curriculum committee. Advising undergraduate students concerning their academic plans and progress through the degree programs offered by the Department of Computer Science and Engineering.

#### ACUE Credential in Effective College Instruction

*Association of College and University Educators (ACUE)* 9/20 – 4/21  
Working across five comprehensive units of study, educators collaborate with peers, receive expert facilitation, and develop practices necessary to design an effective course, to establish a productive learning environment, to use active learning strategies, to promote higher order thinking, and to assess in ways that inform and promote deeper levels of learning. These courses prepare educators in all of the core competencies defined in ACUE's Effective Practice Framework and lead to a Certificate in Effective College Instruction awarded in collaboration with the American Council on Education.

#### TEES Assistant Research Scientist

*Parasol Lab, Department of Computer Science and Engineering, Texas A&M University* 6/13 – 8/20  
Supervised research in robotic motion planning and applications to computational biology. In particular, developed techniques for sampling-based motion planning including specialized methods for constrained robots and algorithms for modeling protein transitions and ligand binding. Mentored students in their research, guided submissions for publication, developed research proposals, and organized group meetings.

#### Consultant

*Digital Oral Care, 3M Company* 6/15 – 12/20  
Algorithm design and development to support 3M™ Clarity™ Aligners. Co-inventor for related patents (under review).

**Lecturer**

*Department of Computer Science and Engineering, Texas A&M University*

1/19 – 5/19

Taught CSCE 411: Design and Analysis of Algorithms, an undergraduate course in Computer Science.

**Postdoctoral Research Associate**

*Parasol Lab, Department of Computer Science and Engineering, Texas A&M University*

6/10 – 5/13

Studied the folding and motion of molecules using motion planning techniques from robotics. In particular, developed new techniques for modeling protein transitions between two or more known target states. Supervised changes to the research group's common C++ code base.

**Research Assistant**

*Parasol Lab, Department of Computer Science and Engineering, Texas A&M University*

1/02 – 5/10

Studied folding, motions, and kinetics of proteins and RNA using motion planning techniques from robotics. Refined existing techniques and developed a parallel implementation to facilitate the study of larger, more complex molecules. Expanded the types of experimental data to validate our simulations with by developing new analysis tools. Extended the implementation of two probabilistic roadmap algorithms (motion planning techniques) for journal submissions.

**Teaching Assistant**

*Department of Computer Science, Texas A&M University*

6/07 – 8/07

Assisted Dr. Teresa Leyk in CPSC 211: Data Structures, an undergraduate course in the Department of Computer Science. Duties included administering 1 hour lab sessions twice a week, providing assistance during office hours to students, and grading labs and homework assignments.

**Graduate Teaching Academy**

*Texas A&M University*

8/06 – 5/07

Participated in professional teaching development at Texas A&M University. The program included attending weekly seminars, developing a teaching statement, and classroom observation under the supervision of a faculty mentor.

**Teaching Practice**

**Teaching Interests:** active learning, promoting a community of scholars, inclusive teaching

Teaching Exemptions:

- Fall 2022 – Spring 2026: Three course teaching reduction over year for Undergraduate Advisor administrative appointment
  - Spring 2025: Additional course teaching reduction for Aspiring Leadership Fellow appointment
- Fall 2020 – Spring 2022: Two course teaching reduction over year for Undergraduate Advisor administrative appointment
- Fall 2019 – Spring 2020: Three course teaching reduction over year for APT startup

**CSCE 120: Program Design and Concepts**

*Department of Computer Science and Engineering, Texas A&M University*

3 Lecture Hours, 1 Lab Hour.

**Role and Impact:** CSCE 120 is a foundational C++ programming course serving over 1,500 students annually from diverse disciplines across the university and all undergraduate classification levels. The course extends prior programming knowledge through computational problem-solving, functional and object-oriented programming, dynamic memory management, and error handling strategies. Innovations include weekly “Fun Field Fridays” connecting computing to students’ varied career interests and proactive engagement strategies. Student course evaluations consistently report the course is approachable, engaging, and effective in building programming proficiency and confidence.

- Spring 2026: *Offered as Stacked Honors Course*  
 In-Person Lectures and Labs  
 98 Students, 1 Lecture Section (3 Lab Sections), 3 TAs  
 Intentional Changes:
- Developed weekly showcasing of university resources to support belonging and well-being.
  - Designed targeted table discussions to increase interactivity in weekly discussions on real-world applications of computing to other domains.
  - Updated honors activities to deepen learning and increase student engagement.
- Fall 2025: In-Person Lectures and Labs  
 70 Students, 1 Lecture Section (4 Lab Sections), 4 TAs  
 Intentional Changes:
- Developed weekly discussions on real-world applications of computing to a variety of domains including finance, psychology, neuroscience, physics, applied mathematics, and visualization to support student belonging. In course evaluations, students noted this positively impacted their view of computing's role in their future.
  - Designed interactive code tracing activities for practice of more advanced concepts such as dynamic memory allocation and management to better prepare students for exams. Students responded with highly positive feedback in course evaluations.
- Fall 2024: *Offered as a Stand-Alone Honors Course*  
 In-Person Lectures and Labs  
 29 Students, 1 Lecture Section (1 Lab Section), 1 TA  
 Intentional Changes:
- Developed a new honors activity to engage students with software development professionals and connect students with future careers. Students found the structured interview approach comfortable and meaningful.

**CSCE 331: Foundations of Software Engineering\*** (Special Designation: Writing-Intensive Course)

*Department of Computer Science and Engineering, Texas A&M University*

3 Lecture Hours, 2 Lab Hours.

**Role and Impact:** CSCE 331: Foundations of Software Engineering is a writing-intensive project-based course serving over 700 students annually. It is required for all B.S. Computer Science, B.A. Computer Science, and B.S. Computer Engineering students and typically taken in their third year. The course provides software development fundamentals for large scale software systems through team projects emphasizing the software engineering processes and practical exposure to current technologies. Innovations include authentic projects with field trips to conduct need studies, design thinking to support product ideation, and practice with appropriate AI use for technical writing and software documentation. Student course evaluations report the course effectively prepares them for internships and careers, with many citing it as the key experience that prepared them for professional work despite initial discomfort with authentic project complexity and ambiguity.

- Fall 2025: *Offered as Stacked Honors Course*  
In-Person Lectures and Labs  
60 Students, 1 Lecture Section (1 Regular Lab Section, 1 Honors Lab Section), 2 TAs  
Intentional Changes:
- Developed instruction and assignments in appropriate and ethical use of Large Language Models to support technical writing and software documentation. Resulting student reports were more consistently high quality and software was more thoroughly documented.
  - Created and deployed ABET outcome mapping to individual assessments for all CSCE 331 sections to make assignment purpose more transparent. Students noted in course evaluations that despite having many assignments, they understood their intent and role.
- Fall 2022\*: *Offered as Stacked Honors Course*  
In-Person Lectures and Labs  
89 Students, 1 Lecture Section (3 Regular Lab Sections, 1 Honors Lab Section), 2 TAs  
Intentional Changes:
- Implemented authentic course projects and activities from prior study abroad course (small size) to large course at scale. Student evaluations showed a positive response with increased engagement and appreciation of applicability to future careers.
- Summer 2022\*: *Offered as Study Abroad Program*  
In-Person Lectures and Labs  
17 Students, 1 Lecture Section (1 Regular Lab Section), co-taught with another instructor, no TAs  
Intentional Changes:
- Developed study abroad program including course activities, industry/technical visits, and cultural visits to provide students with a global perspective.
  - Redesigned course projects to be authentically embedded in the culture and location.
  - Integrated use of an online social annotation platform for course content where students can share annotations, comments, and questions about the reading and videos. Students came to class more prepared to discuss and performed better on daily quizzes.
  - Restructured course sessions and learning management system organization to support greater interaction and integration of lectures and labs. Students appreciated the workshop-style approach.
- Spring 2022\*: *Offered as Stacked Honors Course*  
In-Person Lectures and Labs  
79 Students, 1 Lecture Section (4 Regular Lab Sections, 1 Honors Lab Section), 2 TAs  
Intentional Changes:
- Developed additional honors-specific activities for deeper exploration including field trips, guest speakers, and student creation of learning activities. Students commented in reflections that field trips and guest speakers changed their view of computing and accessibility.

- Fall 2021\*: In-Person Lectures and Labs  
161 Students, 2 Lecture Sections (6 Regular Lab Sections), 4 TAs  
Intentional Changes:
- Created learning activities to develop students' empathy and foster inclusive communities, both for their collaborators and their clients/users.
  - Integrated the design thinking process in project assignments to support student creativity and provide exposure to different perspectives. Student final projects were more diverse in application domain and had more intuitive user interfaces.
  - Deployed peer feedback, peer evaluation, and reflection within project teams to support effective collaboration.
  - Curated updated video content for all course topics.
  - Provided daily knowledge recall practice through low-stakes quizzes.
- Spring 2021\*: *Offered as Stacked Honors Course*  
Flipped with Online Synchronous Lectures and Labs (due to COVID-19)  
83 Students, 1 Lecture Section (4 Regular Lab Sections, 1 Honors Lab Section), 2 TAs  
Intentional Changes:
- Developed honors-specific discussion activities for deeper exploration of course topics.
- Fall 2020\*: Flipped with Online Synchronous Lectures and Labs (due to COVID-19)  
180 Students, 2 Lecture Sections (8 Lab Sections), 4 TAs  
Intentional Changes:
- Completely redesigned as a flipped course for online and hybrid instruction with support from the Engineering Studio for Advanced Instruction & Learning (ESAIL) and in collaboration with another faculty member.
  - Created new video content and online engagement activities to be completed before lecture.
  - Redesigned all in-class activities to support group work on hybrid teams (mixture of in-person and remote members) that reinforce course material and enable effective collaboration.
  - Introduced frequent reflection and discussion activities to personalize and deepen learning.

\* Previously offered as CSCE 315: Programming Studio with 3 Lecture Hours, 1 Lab Hour.

**CSCE 482: Senior Capstone Design** (Communication Special Designation Course)

*Department of Computer Science and Engineering, Texas A&M University*

1 Lecture Hour, 3 Lab Hours.

**Role and Impact:** CSCE 482: Senior Capstone Design is a communication-intensive project-based course required for all B.S. Computer Science and B.A. Computer Science students, serving approximately 450 students annually in their culminating semester. This course prepares students for industry through authentic team-based software projects with external mentors and extensive practice and support in technical communication, both written and oral. Systematic interventions have increased student proficiency in ethics as evidenced by higher ABET review scores for this student outcome. Student evaluations consistently report appreciating the exceptional organization, extensive feedback, and real-world learning experience that develops crucial professional skills.

- Spring 2025: In-Person Lectures and Labs  
34 Students, 1 Lecture Section (1 Lab Section), 1 TA  
Intentional Changes:
- Integrated new ethics content and added assessments into a Canvas module used by all CSCE 482 sections to standardize support of ABET student outcomes.
  - Required all projects to have an external mentor to provide domain-specific feedback resulting in higher student product quality.
- Spring 2024: In-Person Lectures and Labs  
69 Students, 2 Lecture Sections (2 Lab Sections), 2 TAs  
Intentional Changes:
- Revised ethics assignments to better support student synthesis and content creation for younger students resulting in higher ABET student outcome scores by external review panel.
  - Integrated formative feedback throughout project development to coach students in collaboration resulting in teams more quickly and consistently engaging in effective collaboration.
- Fall 2023: In-Person Lectures and Labs  
37 Students, 1 Lecture Section (1 Lab Sections), 1 TA  
Intentional Changes:
- Developed project management assignments and assessments resulting in fewer student teams falling behind schedule in product implementation.
- Spring 2023: In-Person Lectures and Labs  
76 Students, 2 Lecture Sections (2 Lab Sections), 2 TAs  
Intentional Changes:
- Integrated communication and writing materials and modules from The University Writing Center to engage students with existing resources.
  - Developed new ethics assignments that allow students to co-design ethics video content for use in future offerings and/or other courses in the curriculum.
- Spring 2022: In-Person Lectures and Labs  
35 Students, 1 Lecture Section (1 Lab Section), 1 TA  
Intentional Changes:
- Embedded the design thinking process throughout course to support student creativity and solicitation of diverse perspectives resulting in more authentic and innovative student products.
  - Created learning activities to develop students' empathy, appreciate other perspectives, and foster collaboration, both for their teammates and their clients/users, resulting in student products that better meet problem needs and provide more intuitive user interfaces.
  - Restructured all major writing assignments to support an iterative approach to technical writing and provided frequent instructor and peer feedback shifting student mindsets to a revision approach resulting in higher quality writing products.
  - Provided additional reflective activities, both individually and within project teams, to support student learning and meta-cognition.

- Spring 2021: Synchronous Online Lectures and Labs (due to COVID-19)  
26 Students, 1 Lecture Section (1 Lab Section), 1 TA  
Intentional Changes:
- Completely redesigned course to give more direct hands-on instruction throughout increasing student engagement, collaboration, and final product quality.
  - Introduced CITI training and IRB applications for deeper student understanding and appreciation of ethical issues in the discipline at large and in their particular project.
  - Gave students authentic opportunities to practice sharing their work with the broader community through participation in Student Research Week and Engineering Project Showcase.
  - Provided daily knowledge recall practice through low-stakes quizzes.
- Spring 2020: *Offered as Stacked Honors Course*  
In-Person Lectures and Labs for First Half, Synchronous Online for Second Half (due to COVID-19)  
30 Students, 1 Lecture Section (1 Lab Section), 1 TA  
Intentional Changes:
- Introduced reflective activities focusing on teamwork, peer review, and self assessment to support student learning and meta-cognition.
  - Provided greater scaffolding of larger assignments beyond technical writing and created detailed rubrics for all course elements to clearly communicate expectations and give support.
  - Pivoted second half of course to be synchronous online due to COVID-19 pandemic including facilitating safe completion of hardware projects.
- Fall 2019: In-Person Lectures and Labs  
20 Students, 1 Lecture Section (1 Lab Section), 1 TA  
Intentional Changes:
- Created activities to build a community of learners including peer feedback during oral presentations.
  - Introduced active learning techniques to support student engagement and discussion.
  - Created detailed rubrics for technical writing reports to improve transparency and assessment consistency.

### **CSCE 411: Design and Analysis of Algorithms**

*Department of Computer Science and Engineering, Texas A&M University*  
3 Lecture Hours.

**Role and Impact:** CSCE 411: Design and Analysis of Algorithms is a required lecture course serving over 550 students annually, covering algorithmic design paradigms, complexity analysis, algorithm correctness, NP-completeness, and undecidability for juniors and seniors in Computer Science, Computer Engineering, and Applied Mathematics programs. Through innovations including live demonstrations connecting abstract theory to everyday concepts, curated supplementary resources, and interactive mini-projects, the course achieves strong student learning outcomes with students praising the clear explanations, supportive environment, and exceptionally smooth transition to online delivery during COVID-19.

- Summer 2023: *Offered as Study Abroad Program*  
 In-Person Lectures  
 25 Students, 1 Lecture Section, no TAs/Graders  
 Intentional Changes:
- Developed first offering study abroad program including course activities, industry/technical visits, and cultural visits to provide students with a global perspective.
  - Introduced additional active learning techniques in all lectures to increase student engagement and learning retention.
- Spring 2020: In-Person Lectures for First Half, Asynchronous Online for Second Half (due to COVID-19)  
 99 Students, 1 Lecture Section, 2 Graders  
 Intentional Changes:
- Developed and conducted unique live demonstrations to help students connect abstract theoretical concepts with everyday ideas; provided a repository of such activities with detailed instructions as an instructional resource for other faculty in the department.
  - Designed new team project experiences for students to connect concepts and share with their peers.
  - Introduced individual reflection opportunities; provided anonymized results of student connections as an instructional resource for other faculty in the department.
  - Curated online resources for each algorithmic concept; provided curation as an instructional resource for other faculty in the department.
  - Redesigned second half of course to be asynchronous online due to COVID-19 pandemic including creation of new video content and online engagement activities.
- Spring 2019: In-Person Lectures  
 57 Students, 1 Lecture Section, 1 TA, 1 Grader  
 Intentional Changes:
- Introduced active learning techniques in all lectures to engage students in course content.

### CSCE 491: Research (Honors)

*Department of Computer Science and Engineering, Texas A&M University*

**Description:** Mentored students through individual research projects on motion planning algorithms, one on collaboration between multiple human/robot arms and one on modeling allosteric interactions in protein-ligand binding. Students are exposed to a new research field, develop ideas for new algorithms, implement a proof of concept, and report their process and findings in an undergraduate research thesis or in a technical report.

- Spring 2022: Synchronous Online  
 1 Student, 1 Section, 0 TAs/Graders
- Fall 2021: Synchronous Online  
 1 Student, 1 Section, 0 TAs/Graders
- Spring 2021: Synchronous Online  
 1 Student, 1 Section, 0 TAs/Graders
- Fall 2020: Synchronous Online  
 2 Students, 2 Section, 0 TAs/Graders

### Honors and Awards

**Academy of Eminent Educators**, *College of Engineering, Texas A&M University* Fall 2025 – Spring 2028  
 One of 9 faculty selected for the inaugural cohort of faculty for scholarly teaching in engineering education.

**Dean's Fellow**, *College of Engineering, Texas A&M University* Fall 2025 – Spring 2026  
 Selected to continue second phase of projects started to support academic advising across the college as an Aspiring Leadership Fellow.

**Aggie Experience Project**, *Texas A&M University* Fall 2025 – Spring 2026  
 One of 38 faculty selected to participate in the Aggie Experience Project, an evidence-based community of practice

pilot to enhance the student learning experience at Texas A&M University.

- Aspiring Leadership Fellow**, *Texas A&M University* Fall 2024 – Spring 2025  
One of 14 faculty selected as an emerging leader with potential to impact Texas A&M University and build a portfolio of leadership experience.
- IDEATE Faculty Fellow**, *Center for Teaching Excellence, Texas A&M University* Spring 2024 – Fall 2024  
Awarded from the Innovation and Design for Exploration and Analysis in Teaching Excellence (IDEATE) community for commitment to conduct excellent Scholarship of Teaching and Learning (SoTL) research.
- Provost Academic Professional Track Faculty Teaching Excellence Award**, *Texas A&M* Fall 2023 – Spring 2024  
One of 10 faculty awarded from the entire Texas A&M University System for significant impact on teaching.
- Instructional Faculty Teaching Award**, *College of Engineering, Texas A&M University* Fall 2022 – Spring 2023  
One of 4 faculty awarded from the College of Engineering for impact on education including research and service.
- IDEATE Faculty Fellow**, *Center for Teaching Excellence, Texas A&M University* Fall 2021 – Spring 2022  
One of 5 faculty awarded from the Innovation and Design for Exploration and Analysis in Teaching Excellence (IDEATE) community for commitment to conduct excellent Scholarship of Teaching and Learning (SoTL) research.
- IEEE Frontiers in Education New Faculty Fellow**, *Institute of Electrical and Electronics Engineers (IEEE)* Fall 2021  
One of 5 junior faculty funded to attend the 2021 IEEE Frontiers in Education conference.
- Scaling Instructional Excellence for Student Success**, *National Association of System Heads/Association of College and University Educators (NASH-ACUE)* Fall 2020 – Spring 2021  
Selected to participate in a 25-week long course in a strategic initiative on quality instruction and student success.
- Virtual Peer Teaching Fellows**, *Institute for Engineering Education and Innovation, Texas A&M University* Fall 2020  
Selected to participate in a pilot program to improve participant teaching and portfolios and develop a new model of peer evaluation.
- Virtual Teaching Assistant Institute Project**, *Center for Teaching Excellence, Texas A&M University* Summer 2020  
Selected to design online curriculum for the university-mandated Teaching Assistant Institute.
- Gateway Online Course Development Award**, *College of Engineering, Texas A&M University* Summer 2020  
Selected to develop an online course for a large gateway course that previously had only been taught in-person.
- Pre-Symposium Event for Teaching-Track Faculty**, *Computing Research Association - Education* March 2020  
Selected to attend an event to promote the professional development of teaching track faculty, held with the Association for Computing Machinery's Special Interest Group on Computer Science Education (SIGSCE) Symposium.
- IBM Ph.D. Fellowship**, *IBM* Fall 2008 – Spring 2009
- IBM Fran Allen Ph.D. Fellowship**, *IBM* Fall 2007 – Spring 2008
- Graduate Assistance in Areas of National Need Fellowship**, *U.S. Department of Education* Fall 2006 – Spring 2007
- Philanthropic Educational Organization Scholar Award**, *P.E.O.* Fall 2005 – Spring 2006
- NSF Graduate Research Fellowship**, *National Science Foundation* Fall 2002 – Spring 2005
- CRA Distributed Mentor Program Award**, *Computing Research Association* Summer 2001
- University Undergraduate Research Fellow**, *Texas A&M University* Fall 2000 – Spring 2001
- Undergraduate Summer Research Grant**, *Texas A&M University* Summer 2000
- Astronaut Scholarship**, *Texas A&M University* Fall 2000 – Spring 2001
- Lechner Scholarship**, *Texas A&M University* Fall 1998 – Fall 2001

## Service and Professional Activities

### Leadership and Committee Service

#### CSCCE School Planning Committee

*College of Engineering, Texas A&M University*

11/24 – 4/25

Explored and made recommendations for the evolving structure of the department into a School. As Undergraduate Faculty Advisor, provided perspective on potential Computer Science + X degree programs and supporting student success.

### **Academic Advising CAS Self Study Committee**

*College of Engineering, Texas A&M University*

6/24 – 2/25

Conducted a Council for the Advancement of Standards in Higher Education (CAS) self assessment of academic advising across the College of Engineering serving 15 departments, nearly 70 advisors, and 18,000 undergraduate students. Led the sub-team assessing Human Resources, Collaboration and Communication, and Ethics, Laws, and Policies and made recommendations to college leadership for continuous improvement.

### **Focusing Engineering Education Research Task Group**

*College of Engineering, Texas A&M University*

9/24 – 10/24

Assessed the current state of engineering education research in the College of Engineering and made recommendations as part of the Dean's strategic plan to focus research efforts and leverage the college's scale to become a primary contributor to the field. Recommended specific actions and identified necessary areas of support to grow the body of faculty participating in scholarly teaching and contributing to engineering education research.

### **APT Task Force**

*College of Engineering, Texas A&M University*

1/24 – 5/24

Assessed the current climate among Academic Professional Track (APT) faculty in the College of Engineering given the dramatic growth in APT faculty numbers, recent institutional efforts to articulate career paths, and concerns with hiring competition and retention rates. Provided recommendations to strengthen career paths and promote agency among APT faculty in the college.

### **UCAA**

*College of Engineering, Texas A&M University*

8/21 – Present

Representing the Department of Computer Science and Engineering in the faculty advisory committee to the Associate Dean for Undergraduate Programs, raising issues and providing feedback on proposed academic program policy changes across the College of Engineering. Functioning as a liaison to department faculty and leadership to communicate polices relating to academic programs.

### **Faculty of Engineering Education Executive Committee**

*Institute for Engineering Education & Innovation, Texas A&M University*

8/21 – Present

Supporting the engineering education faculty community of practice at Texas A&M University by organizing events, bringing in speakers, and promoting awareness of and fundraising for the faculty group. The faculty groups is interdisciplinary in nature, comprising faculty from both the College of Engineering and the College of Education that are passionate about the advancement of the research, innovation, teaching, and community of engineering education and educators.

### **Faculty of Engineering Education Teaching Task Force**

*Institute for Engineering Education & Innovation,  
Texas A&M University*

Chair, 8/20 – 8/21

Member, 11/19 – Present

Promoting evidence-based pedagogical methods among engineering faculty, increasing awareness of existing educational resources for professional development, and facilitating greater participation in these activities.

### **Faculty and Student Advisory Board**

*Center for Teaching Excellence, Texas A&M University*

12/20 – 5/23

Invited faculty representative for the College of Engineering based on known engagement in teaching and learning to advise the Center for Teaching Excellence and advocate for their work in my college and department, serving as a primary information resource about teaching and learning best practices and professional development opportunities.

### **Education Committee**

*IEEE Robotics and Automation Society  
Member Activities Board*

Technical Education Program Co-Chair, 8/21 – 12/21

Member, 10/20 – Present

Supervised the annual review of Technical Education Programs applications for international "Seasonal Schools" sponsored by IEEE-RAS and made funding recommendations. Seasonal Schools are held in person, virtual, or as a hybrid to maximize the number of students who can participate.

### **Department of Computer Science and Engineering Advisory Committee**

*Department of Computer Science and Engineering, Texas A&M University*

8/20 – 5/23, 8/24 – Present

Elected Academic Professional Track faculty representative on the department's Advisory Committee to advise the Department Head on matters relating to the academic mission and functional duties of the department. In 2020, developed the department's initial by-laws.

### **Undergraduate Curriculum and ABET Committee**

*Department of Computer Science and Engineering, Texas A&M University*

8/21 – Present

Ex officio (non-voting) member serving as liaison between the committee and undergraduate advising and providing perspective on the impact of curriculum and ABET assessment decisions on advising procedures, course offerings, and graduation timelines.

### **Computer Engineering Coordinating Committee**

*Department of Computer Science and Engineering and*

8/21 – Present

*Department of Electrical and Computer Engineering, Texas A&M University*

Reviewing proposed changes to the Computer Engineering undergraduate curriculum jointly managed by the Department of Computer Science and Engineering and the Department of Electrical and Computer Engineering and ensuring compliance with ABET requirements.

### **Undergraduate Admissions Committee**

*Department of Computer Science and Engineering*

Chair, 8/24 – 7/25

*Texas A&M University*

Member 8/21 – Present

Reviews hundreds of candidates for admission into degree programs offered the Department of Computer Science and Engineering from multiple input sources each semester: College of Engineering Entry to a Major (all freshman students in the College of Engineering except for National Merit Scholars must apply for a major after their first two or three semesters), Change of Major (internal to the university), Double Degree/Double Major (internal to the university), and Transfer (external to the university). The only input source not handled by the committee is freshman admission directly into degree programs; this only applies to the B.A. in Computing degree, the B.S. in Computer Science degree at the Galveston campus, and National Merit Scholars. As chair, coordinated these efforts and entered decisions.

### **APT Faculty Search Committee**

*Department of Computer Science and Engineering, Texas A&M University*

8/21 – 5/22

Interviewed and made recommendations to the Department Head for hiring Academic Professional Track faculty in both College Station (2 positions) and Galveston (2 positions) and for the Director of the Department of Computer Science and Engineering Galveston campus, a new position to oversee academics at the Galveston campus. All positions were successfully hired.

### **Peer-Faculty Teaching Feedback Committee**

8/19 – 7/22

*Department of Computer Science and Engineering, Texas A&M University*

Promoted faculty engagement in peer feedback activities on teaching. Paired faculty who are interested in either giving or receiving feedback by way of classroom observations. Provided suggested structure to initiate feedback conversations.

## **Mentoring Activities**

### **Academy for Future Faculty Mentor**

*Texas A&M University*

9/20 – 5/21, 3/23 – 5/24

Mentoring graduate students preparing for a teaching career by advising students on development of teaching portfolio materials, facilitating classroom observations, and discussing best teaching practices.

### **TAMUhack Faculty Advisor**

*Department of Computer Science and Engineering, Texas A&M University*

8/20 – 7/22

Advising student organization in hosting one of the largest annual hackathons in Texas.

### **Software Engineering Faculty Client**

*Department of Computer Science and Engineering, Texas A&M University*

1/20 – 5/20, 1/22 – 5/22

Served as client and mentor for undergraduate team projects.

### **Undergraduate Honors Thesis Mentor**

9/13 – 5/14, 9/18 – 5/19, 9/20 – 5/22

Mentored undergraduate students in research projects related to my work on motion planning and protein folding through organizing weekly meetings, selecting relevant work for them to read, and discussing their reading and research. All undergraduates participated in the University Undergraduate Research Fellows program.

### **Undergraduate Distributed Mentor Project (DMP) Mentor**

6/02 – 8/02, 6/03 – 8/03, 6/06 – 8/06,

6/07 – 8/07, 8/14 – 8/14, 6/17 – 8/17

Mentored an undergraduate student in a 10-week research program sponsored by the Committee on the Status of Women in Computing Research (CRA-W) each summer. Their projects (simulating tryptophan fluorescence and incorporating Molecular Dynamics data into our simulations) were related to my thesis work on protein folding.

## Students Mentored

### *Doctoral Students*

Randy Brooks, Interdisciplinary Engineering Ph.D. Committee Member	Spring 2022 – Present
Bethany Wittemeyer, Academy for Future Faculty Mentor	Spring 2023 – Spring 2024
Robert Lightfoot, Interdisciplinary Engineering Ph.D. Committee Member	Fall 2020 – Summer 2024
Diane Uwacu, Research Mentor, Academy for Future Faculty Mentor	Summer 2015 – Spring 2022
Irving Solis, Research Mentor	Spring 2016 – Spring 2019
Troy McMahon, Research Mentor	Fall 2009 – Summer 2016
Chinwe Ekenna, Research Mentor	Fall 2008 – Spring 2016
Cindy (Hsin-Yi) Yeh, Research Mentor	Fall 2008 – Spring 2016
Sam Jacobs, Research Mentor	Fall 2007 – Fall 2013

### *Master's Students*

Carlos Carrillo, College of Performance, Visualization & Fine Arts M.S. Committee Member	Spring 2024 – Present
Yuno Min, Department of Computer Science and Engineering M.S. Committee Member	Fall 2021 – Summer 2022
Andrew Bregger, Research Mentor	Summer 2017 – Fall 2018
Timothy Ebinger, Research Mentor	Fall 2016 – Fall 2018
Saurabh Mishra, Research Mentor	Fall 2015 – Fall 2017
Matthew Bulluck, Research Mentor	Fall 2014 – Fall 2017
Shuvra Nath, Research Mentor	Fall 2010 – Summer 2013
Kasra Manavi, Research Mentor	Fall 2009 – Spring 2012

### *Undergraduate Students*

Thomas Cousins, Undergraduate Thesis Research Mentor	Fall 2021 – Spring 2022
Marc Riccione, Undergraduate Thesis Research Mentor	Fall 2020 – Spring 2021
Scott Steinhauer, CSCE 491 Research Mentor	Fall 2020
Everett Yang, Undergraduate Thesis Research Mentor	Fall 2017 – Spring 2020
James Motes, Research Mentor	Fall 2017 – Spring 2018
William Adams, Research Mentor	Fall 2017 – Spring 2018
Ben Smith, Research Mentor	Fall 2017 – Spring 2018
Ankit Ramchandani, CRA Undergraduate Distributed Mentor Project (DMP) Mentor	Summer 2017
Diane Uwacu, CRA Undergraduate Distributed Mentor Project (DMP) Mentor	Summer 2014
Aaron Lindsey, Undergraduate Thesis Research Mentor	Fall 2012 – Summer 2014
Manasi Vartak, CRA Undergraduate Distributed Mentor Project (DMP) Mentor	Summer 2007
Annette Stowasser, CRA Undergraduate Distributed Mentor Project (DMP) Mentor	Summer 2006
Bonnie Kirkpatrick, CRA Undergraduate Distributed Mentor Project (DMP) Mentor	Summer 2002, Summer 2003

### *High School Students*

Elise Hernandez, Communications Arts High School Mentor (San Antonio, TX)	Fall 2020 – Spring 2021
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## Editorial Activities

**Steering Committee Member**, *Transformational Teaching and Learning Conference (TTLC)*, 2026, 2025, 2024, 2023, 2022, 2021

**Program Committee Member**, *International Conference of the Learning Sciences (ICLS)*, 2025, 2024, 2023, 2022

**Program Committee Member**, *IEEE Frontiers in Education (FIE)*, 2025

**Program Committee Member**, *IEEE Global Engineering Education Conference (EDUCON)*, 2025

**Program Committee Member**, *Computational Structural Bioinformatics Workshop (CSBW)*, 2021, 2018, 2014, 2013

**Associate Editor**, *IEEE Robotics and Automation Letters (RA-L)*, 2020, 2019, 2018

**Program Committee Member**, *IEEE International Conference on Bioinformatics and Biomedicine (BIBM)*, 2020, 2017

**Program Committee Member**, *International Workshop on Algorithmic Foundations of Robotics (WAFR)*, 2020, 2018

**Guest Editor**, *International Journal of Robotics Research, Special Issue (IJRR)*, 2019, 2018, 2017

**Guest Editor**, *Autonomous Robots, Special Issue (AURO)*, 2017

**Review Process Chair**, *International Symposium on Robotics Research (ISRR)*, 2017

**Review Process Co-Chair**, *Robotics: Science, and Systems Conference (RSS)*, 2016

**Web Chair**, *IEEE International Conference on Robotics and Automation (ICRA)*, 2015

**Program Committee Member**, *Wksp. on Motion Planning and Control of Robot Motion (MLPC)*, 2015

**Program Committee Member**, *Wksp. on Robotics Methods for Structural and Dynamic Modeling of Molecular Systems (RMMSW)*, 2014

**Associate Editor**, *IEEE International Conference on Intelligent Robot Systems (IROS)*, 2013

#### **Reviewer for Conferences and Journals:**

AAAI Conference on Artificial Intelligence (AAAI), ACM Conference on Bioinformatics, Computational Biology and Biomedicine (BCB), ASEE Annual Conference, ASEE Gulf-Southwest Conference, Computational Structural Bioinformatics Workshop (CSBW), IEEE Frontiers in Education (FIE), IEEE Global Engineering Education Conference (EDUCON), IEEE International Conference on Bioinformatics and Biomedicine (BIBM), IEEE International Conference on Robotics and Automation (ICRA), IEEE Robotics and Automation Letters (RA-L), IEEE Signal Processing Letters, IEEE Transactions on Automation Science and Engineering (T-ASE), IEEE Transactions on Robotics (TRO), IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), International Conference of the Learning Sciences (ICLS), International Journal of Robotics Research (IJRR), International Workshop on the Algorithmic Foundations of Robotics (WAFR), Journal of Intelligent and Robotic Systems (JINT), Robotics and Autonomous Systems, Robotics: Science and Systems Conference (RSS), Workshop on Machine Learning in Planning and Control of Robot Motion (MLPC), Workshop on Robotics Methods for Structural and Dynamic Modeling of Molecular Systems (RMMSW)

#### **Professional Society Memberships**

Phi Kappa Phi Honors Society	4/25 – Present
National Academic Advising Association (NACADA)	1/25 – 12/25
American Educational Research Association (AREA)	2/24 – 1/25
American Society for Engineering Education (ASEE)	2/20 – Present
Institute of Electrical and Electronics Engineers (IEEE)	3/14 – Present
IEEE Robotics and Automation Society (IEEE-RAS)	3/14 – Present
Association for Computing Machinery (ACM)	8/12 – Present

#### **Publications in Refereed Journals and Conferences**

Mentored graduate students denoted with \* and mentored undergraduate students denoted with \*\*.

- [1] “WIP: Leveraging Large Language Models to Generate Personalized ABET Outcome Summaries in Project-Based Software Engineering Courses.” Shawna Thomas, Robert Lightfoot, submitted to the *IEEE Frontiers in Education Conference (FIE)* 2026, under review.
- [2] “Structured Integration of Artificial Intelligence in Software Engineering Education: From Perception to Practice.” Robert Lightfoot, Shawna Thomas, Brinley Boyett, in *Proc. of the American Society for Engineering Education (ASEE) Annual Conference*, Charlotte, NC, USA, June 2026, to appear.
- [3] “Exploring the Impact of Prerequisites and Elective Choice on Downstream Upper-Level Computer Science Courses.” Shawna Thomas, Robert Lightfoot, in *Proc. of the IATED International Conference of Education, Research, and Innovation (ICERI)*, Seville, Spain, November 2024.

- [4] “Integrating Open Educational Resources in Software Engineering and Computer Science Courses: Implementation and Student Feedback.” Robert Lightfoot, Shawna Thomas, in *Proc. of the IATED International Conference of Education, Research, and Innovation (ICERI)*, Seville, Spain, November 2024.
- [5] “A Student-Led Ethics Deep Dive, Discussion, and Content Generation Ethics Assignment in Computer Science & Engineering Capstone.” Tracy Hammond, Pauline Wade, Shawna Thomas, Hillary Merzdorf, in *Proc. of the American Society for Engineering Education (ASEE) Annual Conference*, Portland, OR, USA, June 2024.
- [6] “Peer Feedback: Exploring What Hurts and What Helps.” Jacob Robbins, Shawna Thomas, Mahjabin Chowdhury, Jonan Phillip Donaldson, in *Proc. of the International Conference of the Learning Sciences (ICLS)*, Montreal, Quebec, Canada, June 2023.
- [7] “Collaborative Project-Based Learning through Design Thinking for Engaged Learning Framework in Multiple Disciplines.” Sean Kao, Jesus Ojeda Pacheco, Justin Thamsorn, Haley Williams, Shawna Thomas, Sushil Paudyal, Jonan Phillip Donaldson, in *Proc. of the American Educational Research Association (AERA) Annual Meeting*, April 2023.
- [8] “Peer Access Supports Community Values: A Social Network Analysis of Computer Science and Engineering Undergraduates.” Rachele Pederson, Megan Patterson, Shawna Thomas, in *Proc. of the American Educational Research Association (AERA) Annual Meeting*, April 2023.
- [9] “Lessons Learned: Faculty Watch Parties are a Powerful Approach to Foster Diversity and Inclusivity Discussions.” Malini Natarajarathinam, Michael Johnson, Lance White, Sara Amani, Samantha Ray, Larry Powell, Tracy Hammond, Shawna Thomas, Robert Lightfoot\*, Rachele Pedersen, J. Michael Moore, in *Proc. of the American Society for Engineering Education (ASEE) Annual Conference*, Minneapolis, MN, USA, August 2022.
- [10] “There and Back Again: Lessons Learned from Facilitated Faculty Discussions on the Move Online and then Back Face to Face.” Shawna Thomas, Tracy Hammond, Kristi Shryock, Randy Brooks\*, Donna Jaison, Lance White, Robert Lightfoot\*, in *Proc. of the American Society for Engineering Education (ASEE) Annual Conference*, Minneapolis, MN, USA, August 2022.
- [11] “Design Thinking as a Structure for Collaborative Project-based Learning in Multiple Disciplines.” Jonan Phillip Donaldson, Kati Stoddard, Summer Odom, Dawn Parker, Sushil Paudyal, Shawna Thomas, Kathrin Dunlap, Tazim Jamal, in *Proc. of the International Conference of the Learning Sciences (ICLS)*, edited by Clark Chinn, Edna Tan, Carol Chan, Yael Kali, Hiroshima, Japan: International Society of the Learning Sciences (ISLS). June 2022.
- [12] “The Power of the Pre-Course Survey for Course Launch, Addressing Concerns, and Developing Community.” Shawna Thomas, Randy Brooks\*, Robert Lightfoot\*, in *Proc. of the ASEE Gulf-Southwest Annual Conference*, March 2022.
- [13] “Convergence in Collaborative Course Design while Remaining Virtual.” Shawna Thomas, Robert Lightfoot\*, in *Proc. of the IEEE Frontiers in Education Conference (FIE)*, Lincoln, NE, USA, October 2021, pp. 1–8.
- [14] “A Virtual Community of Practice for Enhanced Teaching and Convergence to Strengthen Student Learning, Engagement, and Inclusion.” Tracy Hammond, Randy Brooks\*, Shawna Thomas, Charles W. Peak, Pauline Wade, Charles Patrick, Samantha Ray, Paul Taele, in *Proc. of the IEEE Frontiers in Education Conference (FIE)*, Lincoln, NE, USA, October 2021, pp. 1–8.
- [15] “Creating a Supportive Space for Teaching-Focused Faculty to Write About their Teaching.” Tracy Hammond, Shawna Thomas, Charles Patrick, Pauline Wade, Donna Jaison, Janie Moore, Lance White, Randy Brooks\*, Samantha Ray, Karen Rambo-Hernandez, Karan Watson, in *Proc. of the ASEE First-Year Engineering Experience (FYEE) Conference*, Virtual, August 2021.
- [16] “The Disconnect Between Engineering Students’ Desire to Discuss Racial Injustice in the Classroom and Faculty Anxieties.” Tracy Hammond, Samantha Ray, Paul Taele, Shawna Thomas, Karan Watson, Christine Stanley, Seth Polsley, in *Proc. of the American Society for Engineering Education (ASEE) Annual Conference*, Virtual, July 2021.
- [17] “The Development of a Texas A&M University Faculty of Engineering Education.” Tracy Hammond, Karan Watson, Samantha Ray, Robert Lightfoot\*, Drew Casey, and Shawna Thomas, in *Proc. of the ASEE Gulf-Southwest Annual Conference*, March 2021. (3rd Place for Best Faculty/Staff/Professional Paper)

- [18] “Using Guided Motion Planning to Study Binding Site Accessibility.” Diane Uwacu\*, Abigail Ren, Shawna Thomas, Nancy M. Amato, in *Proc. of the ACM Conference on Bioinformatics, Computational Biology and Health Informatics (BCB)*, Virtual, September 2020, Association for Computing Machinery: New York, NY, USA, Article 109, pp. 1–10.
- [19] “Fast Collision Detection for Motion Planning using Shape Primitive Skeletons.” Mukulika Ghosh, Shawna Thomas, Nancy M. Amato, in *Algorithmic Foundations of Robotics XIII (WAFR 2018)*, edited by Marco Morales, Lydia Tapia, G. Sanchez-Ante, Seth Hutchinson, Springer Proceedings in Advanced Robotics, vol 14, Springer, Cham. May, 2020. (acceptance rate: 53%)
- [20] “Multi-Robot Task and Motion Planning With Subtask Dependencies.” James Motes, Read Sandstrom, Hannah Lee, Shawna Thomas, Nancy M. Amato, in *Robotics and Automation Letters (RA-L)*, 5(2): 3338–3345, April 2020. (acceptance rate: 42%)
- [21] “Special Issue on the International Symposium on Robotics Research 2017 (ISRR).” Nancy M. Amato, Greg Hager, Shawna Thomas, Miguel Torres-Torriti in the *International Journal of Robotics Research (IJRR)*, 38(12–13):1327–1328, September 2019.
- [22] “Interaction Templates for Multi-Robot Systems.” James Motes\*\*, Read Sandstrom, Will Adams\*\*, Tobi Ogunyale, Shawna Thomas, Nancy M. Amato, in *Robotics and Automation Letters (RA-L)*, 4(3): 2926–2933, July 2019. (acceptance rate: 45%)
- [23] “Special Issue on Robotics: Science and Systems 2016 (RSS).” Nancy M. Amato, Chinwe Ekenna, Shawna Thomas, Nicolas Roy, in the *International Journal of Robotics Research (IJRR)*, 37(10):1115–1116, November 2018.
- [24] “Special Issue on Robotics: Science and Systems 2016 (RSS).” Nancy M. Amato, Oliver Brock, Marco Morales, Shawna Thomas, in *Autonomous Robots*, 42(7):1299–1300, October 2018.
- [25] “Sampling-Based Motion Planning with Reachable Volumes for High-Degree-of-Freedom Manipulators.” Troy McMahon\*, Shawna Thomas, Nancy M. Amato, in the *International Journal of Robotics Research (IJRR)*, 37(7):779–817, July 2018.
- [26] “A General and Flexible Search Framework for Disassembly Planning.” Timothy Ebinger\*, Sascha Kaden, Shawna Thomas, Robert Andre, Nancy M. Amato, Ulrike Thomas, in *Proc. of the IEEE International Conference on Robotics and Automation (ICRA)*, Brisbane, QLD, Australia, May 2018, pp. 3548–3555. (acceptance rate: 41%)
- [27] “Topological Nearest-Neighbor Filtering for Sampling-Based Planners.” Read Sandstrom, Andrew Bregger\*, Ben Smith\*\*, Shawna Thomas, Nancy M. Amato, in *Proc. of the IEEE International Conference on Robotics and Automation (ICRA)*, Brisbane, QLD, Australia, May 2018, pp. 3053–3060. (acceptance rate: 41%)
- [28] “Manipulation Planning with Directed Reachable Volumes.” Troy McMahon\*, Read Sandstrom, Shawna Thomas, Nancy M. Amato, in *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Vancouver, BC, Canada, September 2017, pp. 4026–4033.
- [29] “Motion Planning using Hierarchical Aggregation of Workspace Obstacles.” Mukulika Ghosh, Shawna Thomas, Marco Morales Aguirre, Samuel Rodriguez, Nancy M. Amato, in *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Daejeon, Korea (South), October 2016, pp. 5716–5721. (acceptance rate: 48%)
- [30] “Adaptive Local Learning in Sampling Based Motion Planning for Protein Folding.” Chinwe Ekenna\*, Shawna Thomas, Nancy M. Amato, in *BMC Systems Biology*, 10(Suppl 2):49–68, August 2016.
- [31] “The Impact of Approximate Methods on Local Learning in Motion Planning.” Diane Uwacu\*, Chinwe Ekenna\*, Shawna Thomas, Nancy M. Amato, in *Proc. of the RSS Workshop on Robot Learning and Planning*, Ann Arbor, MI, USA, June 2016.
- [32] “Adaptive Local Learning in Sampling Based Motion Planning for Protein Folding.” Chinwe Ekenna\*, Shawna Thomas, Nancy M. Amato, in *Proc. of the IEEE International Conference on Bioinformatics and Biomedicine (BIBM)*, Washington, DC, USA, November 2015, pp. 61–68. (acceptance rate: 19%)

- [33] “Improved Roadmap Connection via Local Learning for Sampling Based Planners.” Chinwe Ekenna\*, Diane Uwacu\*, Shawna Thomas, Nancy M. Amato, in *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Hamburg, Germany, October 2015, pp. 3227–3234. (acceptance rate: 46%)
- [34] “Studying Learning Techniques in Different Phases of PRM Construction.” Chinwe Ekenna\*, Diane Uwacu\*, Shawna Thomas, Nancy M. Amato, in *Proc. of the Machine Learning in Planning and Control of Robot Motion Workshop (IROS-MLPC)*, Hamburg, Germany, October 2015.
- [35] “Decoy Database Improvement for Protein Folding.” Hsin-Yi (Cindy) Yeh\*, Aaron Lindsey\*\*, Chih-Peng Wu, Shawna Thomas, Nancy M. Amato, in *Journal of Computational Biology (JCB)*, 22(9):823–836, September 2015.
- [36] “Using Motion Planning to Rank Ligand Binding Affinity.” Hsin-Yi (Cindy) Yeh, Shawna Thomas, Nancy M. Amato, in *Proc. of the ACM Conference on Bioinformatics, Computational Biology and Health Informatics (BCB)*, Atlanta, GA, USA, September 2015, Association for Computing Machinery: New York, NY, USA, pp. 529–530.
- [37] “Reachable Volume RRT.” Troy McMahan\*, Shawna Thomas, Nancy M. Amato, in *Proc. of the IEEE International Conference on Robotics and Automation (ICRA)*, Seattle, WA, USA, May 2015, pp. 2977–2984. (acceptance rate: 41%)
- [38] “Improving Decoy Databases for Protein Folding Algorithms.” Aaron Lindsey\*\*, Hsin-Yi (Cindy) Yeh\*, Chih-Peng Wu, Shawna Thomas, Nancy M. Amato, in *Proc. of the ACM Conference on Bioinformatics, Computational Biology and Health Informatics (BCB)*, Newport Beach, CA, USA, September 2014, Association for Computing Machinery: New York, NY, USA, pp. 717–724.
- [39] “Sampling-Based Motion Planning with Reachable Volumes: Application to Manipulators and Closed Chain Systems.” Troy McMahan\*, Shawna Thomas, Nancy M. Amato, in *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Chicago, IL, USA, September 2014, pp.3705–3712. (acceptance rate: 47%)
- [40] “Adaptive Neighbor Connection Aids Protein Motion Modeling.” Chinwe Ekenna\*, Shawna Thomas, Nancy M. Amato, in *Proc. of the RSS Workshop on Robotics Methods for Structural and Dynamic Modeling of Molecular Systems*, Berkeley, CA, USA, July 2014.
- [41] “Improving Decoy Databases for Protein Folding Algorithms.” Aaron Lindsey\*\*, Hsin-Yi (Cindy) Yeh\*, Chih-Peng Wu, Shawna Thomas, Nancy M. Amato, in *Proc. of the RSS Workshop on Robotics Methods for Structural and Dynamic Modeling of Molecular Systems*, Berkeley, CA, USA, July 2014.
- [42] “MARRT: Medial Axis Biased Rapidly-Exploring Random Trees.” Jory Denny, Evan Greco, Shawna Thomas, Nancy M. Amato, in *Proc. of the IEEE International Conference on Robotics and Automation (ICRA)*, Hong Kong, China, May 2014, pp. 90–97. (acceptance rate: 48%)
- [43] “Sampling-Based Motion Planning with Reachable Volumes: Theoretical Foundations.” Troy McMahan\*, Shawna Thomas, Nancy M. Amato, in *Proc. of the IEEE International Conference on Robotics and Automation (ICRA)*, Hong Kong, China, May 2014, pp. 6514–6521. (acceptance rate: 48%)
- [44] “UMAPRM: Uniformly Sampling the Medial Axis.” Hsin-Yi (Cindy) Yeh\*, Jory Denny, Aaron Lindsey\*\*, Shawna Thomas, Nancy M. Amato, in *Proc. of the IEEE International Conference on Robotics and Automation (ICRA)*, Hong Kong, China, May 2014, pp. 5798–5803. (acceptance rate: 48%)
- [45] “Adaptive Neighbor Connection for PRMs: A Natural Fit for Heterogeneous Environments and Parallelism.” Chinwe Ekenna\*, Sam Ade Jacobs\*, Shawna Thomas, Nancy M. Amato, in *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Tokyo, Japan, November 2013, pp. 1249–1256. (acceptance rate: 43%)
- [46] “Blind RRT: A Probabilistically Complete Distributed RRT.” Cesar Rodriguez, Jory Denny, Sam Jacobs\*, Shawna Thomas, Nancy M. Amato, in *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Tokyo, Japan, November 2013, pp. 1758–1765. (acceptance rate: 43%)
- [47] “Rigidity Analysis for Protein Motion and Folding Core Identification.” Shawna Thomas, Lydia Tapia, Chinwe Ekenna\*, Hsin-Yi (Cindy) Yeh\*, Nancy M. Amato, in *Proc. of the AAAI Workshop on Artificial Intelligence and Robotics Methods for Computational Biology*, Bellevue, Washington, July 2013, pp. 38–43.

- [48] “A Scalable Distributed RRT for Motion Planning.” Sam Ade Jacobs\*, Nicholas Stradford, Cesar Rodriguez, Shawna Thomas, Nancy M. Amato, in *Proc. of the IEEE International Conference on Robotics and Automation (ICRA)*, Karlsruhe, Germany, May 2013, pp. 5088–5095. (acceptance rate: 39%)
- [49] “A Multi-Directional Rapidly Exploring Random Graph (mRRG) for Protein Folding.” Shuvra Nath\*, Shawna Thomas, Chinwe Ekenna\*, Nancy M. Amato, in *Proc. of the ACM Conference on Bioinformatics, Computational Biology and Biomedicine (BCB)*, Orlando, FL, October 2012, Association for Computing Machinery: New York, NY, USA, pp. 44–51. (acceptance rate: 40%)
- [50] “UOBPRM: A Uniformly Distributed Obstacle-Based PRM.” Cindy (Hsin-Yi) Yeh\*, Shawna Thomas, David Epstein, Nancy M. Amato, in *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Vilamoura, Algarve, Portugal, October 2012, pp. 2655–2662. (acceptance rate: 45%)
- [51] “A Scalable Method for Parallelizing Sampling-Based Motion Planning Algorithms.” Sam Ade Jacobs\*, Kasra Manavi\*, Juan Burgos, Jory Denny, Shawna Thomas, Nancy M. Amato, in *Proc. of the IEEE International Conference on Robotics and Automation (ICRA)*, St. Paul, MN, USA, May 2012, pp. 2529–2536. (acceptance rate: 40%)
- [52] “A Motion Planning Approach to Studying Molecular Motions.” Lydia Tapia, Shawna Thomas, Nancy M. Amato, in *Communications in Information and Systems (CIS)*, 10(1): 53–68, 2010.
- [53] “Reachable Distance Space: Efficient Sampling-Based Planning for Spatially Constrained Systems.” Xinyu Tang, Shawna Thomas, Philip Coleman, Nancy M. Amato, in the *International Journal of Robotics Research (IJRR)*, 29(7): 916–934, 2010.
- [54] “Planning with Reachable Distances.” Xinyu Tang, Shawna Thomas, Nancy M. Amato, in *Algorithmic Foundations of Robotics XIII (WAFR 2008)*, edited by Greg Chirikjian, Howie Choset, Marco Morales, Todd Murphy, Springer Tracts in Advanced Robotics, vol 57, Springer, Berlin, Heidelberg, 2009, pp.517–531.
- [55] “An Unsupervised Adaptive Strategy for Constructing Probabilistic Roadmaps.” Lydia Tapia, Shawna Thomas, Bryan Boyd, Nancy M. Amato, in *Proc. of the IEEE International Conference on Robotics and Automation (ICRA)*, Kobe, Japan, May 2009, pp. 4037–4044. (acceptance rate: 43%)
- [56] “Incremental Map Generation (IMG).” Dawen Xie, Marco Morales, Roger Pearce, Shawna Thomas, Jyh-Ming Lien, Nancy M. Amato, in *Algorithmic Foundations of Robotics XII (WAFR 2006)*, edited by S. Akella, Nancy M. Amato, W. Huang, B. Mishra, Springer Tracts in Advanced Robotics, vol 47, Springer, Berlin, Heidelberg, 2008, pp. 53–68. (acceptance rate: 49%)
- [57] “RESAMPL: A Region-Sensitive Adaptive Motion Planner.” Samuel Rodriguez, Shawna Thomas, Roger Pearce, Nancy M. Amato, in *Algorithmic Foundations of Robotics XII (WAFR 2006)*, edited by S. Akella, Nancy M. Amato, W. Huang, B. Mishra, Springer Tracts in Advanced Robotics, vol 47, Springer, Berlin, Heidelberg, 2008, pp. 285–300. (acceptance rate: 49%)
- [58] “Simulating RNA Folding Kinetics on Approximated Energy Landscapes.” Xinyu Tang, Shawna Thomas, Lydia Tapia, David P. Giedroc, Nancy M. Amato, in the *Journal of Molecular Biology (JMB)*, 381(4): 1055–1067, 2008.
- [59] “Kinetics Analysis Methods for Approximate Folding Landscapes.” Lydia Tapia, Xinyu Tang, Shawna Thomas, Nancy M. Amato, in *Bioinformatics*, 23(13): i539–i548, July 2007.
- [60] “Simulating Protein Motions with Rigidity Analysis.” Shawna Thomas, Xinyu Tang, Lydia Tapia, Nancy M. Amato, in *Journal of Computational Biology (JCB)*, 14(6): 839–855, July 2007.
- [61] “Biasing Samplers to Improve Motion Planning Performance.” Shawna Thomas, Marco Morales, Xinyu Tang, Nancy M. Amato, in *Proc. of the IEEE International Conference on Robotics and Automation (ICRA)*, Rome, Italy, April 2007, pp. 1625–1630. (acceptance rate: 44%)
- [62] “Planning with Reachable Distances: Fast Enforcement of Closure Constraints.” Xinyu Tang, Shawna Thomas, Nancy M. Amato, in *Proc. of the IEEE International Conference on Robotics and Automation (ICRA)*, Rome, Italy, April 2007, pp. 2694–2699. (acceptance rate: 44%)
- [63] “Tools for Simulating and Analyzing RNA Folding Kinetics.” Xinyu Tang, Shawna Thomas, Lydia Tapia, Nancy M. Amato, in *Research in Computational Molecular Biology (RECOMB 2007)*, edited by T. Speed, H. Huang, Lecture Notes in Computer Science, vol 4453, Springer, Berlin, Heidelberg, April 2007, pp. 268–282. (acceptance rate: 21%)

- [64] “Simulating Protein Motions with Rigidity Analysis.” Shawna Thomas, Xinyu Tang, Lydia Tapia, Nancy M. Amato, in *Research in Computational Molecular Biology (RECOMB 2006)*, edited by A. Apostolico, C. Guerra, S. Istrail, P. Pevzner, M. Waterman, Lecture Notes in Computer Science, vol 3909, Springer, Berlin, Heidelberg, April 2006, pp. 394–409. (acceptance rate: 18%)
- [65] “Parallel Protein Folding with STAPL.” Shawna Thomas, Gabriel Tanase, Lucia K. Dale, Jose M. Moreira, Lawrence Rauchwerger, Nancy M. Amato, in *Concurrency and Computation: Practice and Experience*, 17(14): 1643–1656, December 2005.
- [66] “Protein Folding by Motion Planning.” Shawna Thomas, Guang Song, Nancy M. Amato, in *Physical Biology*, 2(4):S148–S155, November 2005.
- [67] “Using Motion Planning to Study RNA Folding Kinetics.” Xinyu Tang, Bonnie Kirkpatrick\*\*, Shawna Thomas, Guang Song, Nancy M. Amato, in *Journal of Computational Biology (JCB)*, 12(6): 862–881, August 2005.
- [68] “Parallel Protein Folding with STAPL.” Shawna Thomas, Nancy M. Amato, in *Proc. of the IEEE International Parallel and Distributed Processing Symposium*, Santa Fe, NM, USA, April 2004.
- [69] “Using Motion Planning to Study RNA Folding Kinetics.” Xinyu Tang, Bonnie Kirkpatrick\*\*, Shawna Thomas, Guang Song, Nancy M. Amato, in *Proc. of the International Conference on Research in Computational Molecular Biology (RECOMB)*, San Diego, CA, USA, March 2004, pp. 252–261. (acceptance rate: 17%)
- [70] “A General Framework for PRM Motion Planning.” Guang Song, Shawna Thomas, Nancy M. Amato, in *Proc. of the IEEE International Conference on Robotics and Automation (ICRA)*, Taipei, Taiwan, September 2003, pp. 4445–4450. (acceptance rate: 61%)
- [71] “A General Framework for Sampling on the Medial Axis of the Free Space.” Jyh-Ming Lien, Shawna Thomas, Nancy M. Amato, in *Proc. of the IEEE International Conference on Robotics and Automation (ICRA)*, Taipei, Taiwan, September 2003, pp. 4439–4444. (acceptance rate: 61%)
- [72] “A Path Planning-Based Study of Protein Folding with a Case Study of Hairpin Formation in Protein G and L.” Guang Song, Shawna Thomas, Ken A. Dill, J. Martin Scholtz, Nancy M. Amato, in *Proc. of the Pacific Symposium on Biocomputing (PSB)*, Lihue, HI, USA, January 2003, pp. 240–251.
- [73] “Customizing PRM Roadmaps at Query Time.” Guang Song, Shawna Miller<sup>1</sup>, Nancy M. Amato, in *Proc. of the IEEE International Conference on Robotics and Automation (ICRA)*, Seoul, Korea (South), May 2001, pp. 1500–1505. (acceptance rate: 65%)

## Patents

- [74] Alexandra R. Cunliffe, Guruprasad Somasundaram, Benjamin D. Zimmer, Nitsan Ben-Gal Nguyen, Vera Shuman, Nancy M. Amato, Shawna L. Thomas. Automated process for intermediate orthodontic digital setup reuse due to treatment plan modifications. US-12419723-B2. United States, issued September 2025.
- [75] Alexandra R. Cunliffe, Benjamin D. Zimmer, Guruprasad Somasundaram, Deepti Pachauri, Jonathan D. Gandrud, Arash Sangari, Shawna L. Thomas, Nancy M. Amato. Methods to automatically remove collisions between digital mesh objects and smoothly move mesh objects between spatial arrangements. US-12285309-B2. United States, issued April 2025.
- [76] Nitsan Ben-Gal Nguyen, Benjamin D. Zimmer, Guruprasad Somasundaram, Alexandra R. Cunliffe, Brian J. Stankiewicz, Elisa J. Collins, David T. Maiden Mueller, Steven C. Demlow, Cody J. Olson, Muhammad J. Afridi, Nancy Amato, Shawna L. Thomas, Alexander Gutierrez, Arash Sangari, Jonathan D. Gardner. Method for Automated Generation of Orthodontic Treatment Final Setups. US-20210259808-A1. United States, filed August 2021.

## Teaching-Related Presentations, Panels, Posters, and Other Publications

- [77] “Exploring Learning, Thinking, and Engineering Thought: What it Means to Think.” Shawna Thomas, *Engineering Faculty Discussion Series* presentation, College of Engineering, Texas A&M University, March 2025.

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<sup>1</sup>Former last name.

- [78] “Making Large Feel Small.” Shawna Thomas, *Faculty Engagement: Focus on Education* Presentation, College of Engineering, Texas A&M University, August 2024.
- [79] “Engaging Students in Deeper Ethics Discussions.” Shawna Thomas, Pauline Wade, Tracy Hammond, Hillary Merzdorf, *Transformational Teaching and Learning Conference (TTLC)*, Texas A&M University, May 2024.
- [80] “Exploring Design-based Research and Design Thinking for Computer Science Education.” Jacob Robbins, Shawna Thomas, Mahjabin Chowdhury, *American Educational Research Association (AERA)*, Poster, April 2024.
- [81] “Bringing Authenticity to Group Projects: Example from a Junior-Level Computer Science Course.” Shawna Thomas, Robert Lightfoot\*, *IEEE Frontiers in Education (FIE)*, Poster, October 2023.
- [82] “Collaborative Teaching for Computer Science and Computer Engineering Capstone Courses.” Tracy Hammond, Pauline Wade, Shawna Thomas, *Transformational Teaching and Learning Conference (TTLC)*, Texas A&M University, May 2023.
- [83] “How to Manage Capstone Teams Effectively.” Stavros Kalafatis, Pauline Wade, Shawna Thomas, *Capstone and Undergraduate Research Experiences in Engineering (CUREE)*, Institute for Engineering Education and Innovation, Texas A&M University, May 2023.
- [84] “Pre-Course Survey for Reducing Day One Anxiety and Questions.” Randy Brooks\*, Shawna Thomas, *Texas Conference on Student Success*, College Station, TX, USA, October 2022.
- [85] “The Power of the Pre-Course Survey for Course Launch, Addressing Concerns, and Developing Community.” Randy Brooks\*, Shawna Thomas, *Transformational Teaching and Learning Conference (TTLC)*, Texas A&M University, May 2022.
- [86] “Quick-Fire Rotations for Discussions and Perspective Taking.” Shawna Thomas, Robert Lightfoot\*, *Transformational Teaching and Learning Conference (TTLC)*, Texas A&M University, May 2022.
- [87] “Creating Loud Classrooms: Sharing Ideas with Each Other on How to Foster Student-to-Student Interactions in Class.” Shawna Thomas, Engineering Education Faculty Group Presentation, Institute for Engineering Education and Innovation, Texas A&M University, December 2021.
- [88] “Partners in Crime — Collaborative Course Development.” Shawna Thomas, Robert Lightfoot\*, *Transformational Teaching and Learning Conference (TTLC)*, Texas A&M University, May 2021.
- [89] “The Power of a Writing Community Group.” Tracy Hammond, Randy Brooks\*, Shawna Thomas, Robert Lightfoot\*, *Transformational Teaching and Learning Conference (TTLC)*, Texas A&M University, May 2021.
- [90] “Reimagining Diversity and Inclusion Activities: Raising Awareness through an Accessible Conversation about Key Contributions.” Shawna Thomas, Charles Peak, *Transformational Teaching and Learning Conference (TTLC)*, Texas A&M University, May 2021.
- [91] “Using Course Maps to Reimagine Course Design and Student Engagement.” Shawna Thomas, Robert Lightfoot\*, *Transformational Teaching and Learning Conference (TTLC)*, Texas A&M University, May 2021.
- [92] “A Virtual Community of Practice to Enhance Teaching to Strengthen Student Learning.” Tracy Hammond, Randy Brooks\*, Shawna Thomas, Charles W. Peak, Charles Patrick, Pauline Wade, *Transformational Teaching and Learning Conference (TTLC)*, Texas A&M University, May 2021.
- [93] “How to Systematically Improve Teaching, Start Conducting Engineering Education Research, and Engage in External Service Related to Engineering Education.” Tracy Hammond, Michael Johnson, Jacques Richard, Kristi Shryock, Shawna Thomas, Tanya Wickliff, Engineering Education Faculty Group Panel Discussion, Institute for Engineering Education and Innovation, Texas A&M University, March 2021.
- [94] “Best Practices in Robotics Education: Perspectives from an IEEE RAS Women in Engineering Panel.” Shawna Thomas, *IEEE Robotics and Automation Magazine*, vol 28, issue 1, March 2021, pp. 12–15.
- [95] “Tips and Tricks to Increase Student Engagement.” Invited Speaker at Engineering Studio for Advanced Instruction & Learning (ESAIL) Webinar, Texas A&M University, November 2020, December 2020, January 2021.
- [96] “Best Practices in Robotics Education.” Panel Organizer and Moderator, IEEE Robotics and Automation Society (IEEE-RAS) Women in Robotics Panel Discussion, December 2020.

- [97] “More of Juggling Chainsaws while Riding a Unicycle: Effectively Engaging In-Person and Remote Students.” Invited Speaker at Center for Teaching Excellence Workshop, Texas A&M University, September 2020.
- [98] “Creating and Implementing an Online Course Etiquette Appreciative Agreement: Recommendations and Insights for Updating Course Material and Social Expectations to Aid in the Transition to Online Learning During the COVID-19 Pandemic.” Tracy Hammond, Robert Lightfoot\*, Samantha Ray, Shawna Thomas, Engineering Education Faculty Technical Report, June 2020, <https://hdl.handle.net/1969.1/188237>.
- [99] “Writing Groups 101: Who, What, Why, When, Where, How.” Tracy Hammond, Robert Lightfoot\*, Shawna Thomas, Engineering Education Faculty Group Presentation, Institute for Engineering Education and Innovation, Texas A&M University, May 2020.