Capstone Design
CONFERENCE 2018

JUNE 4-6, 2018 ▶ ROCHESTER, NY

CONFERENCE PROGRAM

www.capstoneconf.org

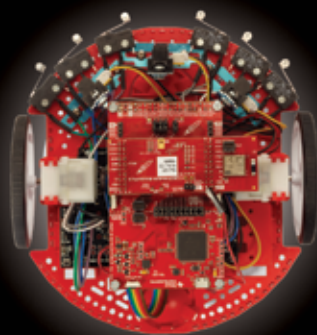# Conference Overview

Monday, June 4, 2018

7:00 – 8:30 a.m.	**Registration/Breakfast**
8:30 – 10:00 a.m.	**Opening Session**
10:30 a.m. – 12:00 p.m.	**Concurrent Panel Session 1**
12:15 – 1:45 p.m.	**Keynote Lunch**
2:00 – 3:30 p.m.	**Concurrent Panel Session 2**
4:00 – 5:30 p.m.	**Poster Session 1**
6:00 – 7:30 p.m.	**Workshop Session 1**
7:30 – 8:30 p.m.	**News and Brews**

Tuesday, June 5, 2018

7:00 – 8:30 a.m.	**Registration/Breakfast**
8:30 a.m. – 12:15 p.m.	**Local Tours**
9:00 – 10:30 a.m.	**Workshop Session 2**
10:45 a.m. – 12:15 p.m.	**Workshop Session 3**
12:30 – 2:00 p.m.	**Birds of a Feather Lunch**
2:15 – 3:45 p.m.	**Concurrent Panel Session 3**
4:00 – 5:30 p.m.	**Poster Session 2**
6:00 – 7:30 p.m.	**Workshop Session 4**
7:30 – 8:30 p.m.	**Dessert Break**
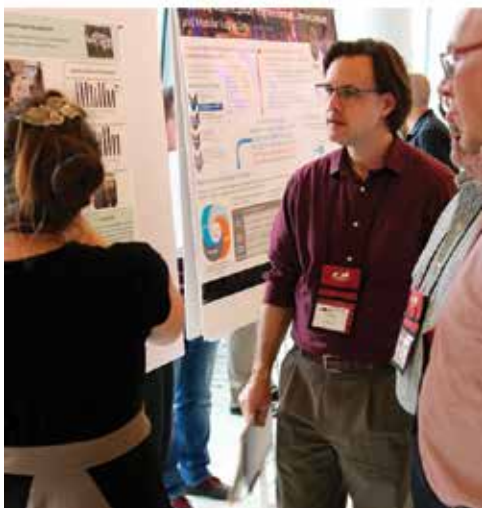
Wednesday, June 6, 2018

6:30 – 7:30 a.m.	**Informal Walk/Run**
8:00 – 9:00 a.m.	**Registration/Breakfast**
9:00 – 10:30 a.m.	**Concurrent Panel Session 4**
11:00 a.m. – 12:30 p.m.	**Concurrent Panel Session 5**
12:45 – 2:00 p.m.	**Closing Lunch**

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Capstone Overview

The goal of the Capstone Design Conference is to provide a forum for the engineering and applied science capstone community to share ideas about implementing and improving design-based capstone courses. Conferences are held biannually in even years.

Through the five previous Capstone Design Conferences, we have established a network of capstone design educators and associated stakeholders committed to supporting one another in implementing various capstone course models, managing teams and projects, engaging stakeholders, incorporating new technology and collaborating to identify and disseminate effective practices in capstone design education. We welcome the 2018 conference attendees into this friendly and talented community.

As an outcome of the 2010, 2012, 2014 and 2016 conferences, we published an extensive set of peer-reviewed articles about capstone pedagogy in special issues of the *International Journal of Engineering Education* (IJEE, vol. 27-6, vol. 30-1, vol. 31-6B, and vol. 33-5). We intend to pursue another special issue of IJEE following the 2018 conference. We invite you to join us in our quest for shared excellence in capstone design instruction.

Welcome
from the Co-Chairs

Greetings! On behalf of the entire Capstone Design Conference Organizing Committee we welcome you to Rochester, NY for the 2018 Capstone Design Conference!

We are thrilled to continue the success of the previous capstone conferences and to continue building a community of educators, students, and industry to discuss, analyze, and improve capstone design education. As with the previous capstone conferences, this conference is intentionally designed to promote discussion and interaction across the capstone community. In other words, welcome to a conference at which you will get a chance to confer! As capstone design educators and consumers, we appreciate the importance of understanding our own challenges, the need to look outside our own organization to find new ways to continuously improve, and the value of experiencing failure – occasionally. At the 2018 Capstone Conference, you will find opportunities to share and learn about all of these!

This conference continues to build on the format and tradition established by previous conferences. In contrast to the traditional podium presentation format, this conference instead features two conference-wide poster sessions (including both posters *about* capstone design and posters *by* capstone design teams) to encourage vibrant and extensive sharing of ideas and experiences. Based on themes that emerged from the selection of 2018 Capstone Conference accepted papers and posters, we have created a series of interactive panel discussion topics related to capstone design. In addition, a range of workshops will provide attendees hands-on opportunities to learn new skills and strategies to improve their own capstone design programs. This year, we are honored to welcome Patricia Moore, an internationally renowned gerontologist and designer, as our keynote speaker. Finally, look for a series of quests designed to help you network with other attendees, learn a little bit about our host institution, the Rochester Institute of Technology, and get the most out of the conference.

The 2018 conference continues the tradition of student involvement, reflecting students' key role in capstone design. Keep an eye out for featured capstone student projects in the poster session as well as invited student participation in many of the panel sessions. This year we are happy to include a special design challenge for our student participants and look forward to their special report-out during the closing session. We are grateful to the contributions of our many conference sponsors, exhibitors, and advertisers who support the conference and help us keep our conference fees as low as possible.

So, again, welcome! Please take the opportunity to immerse yourself in this conference; expand your capstone network, exchange ideas, and empower your involvement with capstone design courses. We thank you for attending the 2018 conference – we welcome feedback on conference effectiveness and encourage you to spread the word. We look forward to collaborating with you now and in the future!

– Robert Hart and Keith Stanfill, co-chairs

Robert

Keith

Organizing
Committee

Robert Hart, Co-chair	**University of Texas-Dallas**
Keith Stanfill, Co-chair	**University of Florida**
Beth DeBartolo, Local Chair	**Rochester Institute of Technology**
Steve Beyerlein, Workshops	**University of Idaho**
Patsy Brackin, Panels	**Rose-Hulman Institute of Technology**
Jay Goldberg, Industry Involvement	**Marquette University**
Amy Hortop, Student Involvement	**University of Michigan**
Susannah Howe, Communications	**Smith College**
Glen Livesay, Special Sessions	**Rose-Hulman Institute of Technology**
Shraddha Sangelkar, Posters	**Penn State-Erie**
Bridget Smyser, Papers	**Northeastern University**

The Organizing Committee gratefully acknowledges the assistance of the volunteers from these and other institutions who helped with various aspects of planning the conference.

Campus photos courtesy of Rochester Institute of Technology

Capstone Conference Close-ups

Agenda

DAY 1 — Monday, June 4, 2018

7:00 a.m. – 8:30 a.m.   **Registration & Breakfast** — SLA-2210-2240

8:30 a.m. – 10:00 a.m.   **Opening Session** — SLA-2210-2240

10:00 a.m. – 10:30 a.m.   **Break**

10:30 a.m. – 12:00 p.m.   **Concurrent Panel Session 1**

Panel 1A: Multidisciplinary Models for Capstone Success — SLA-2140
Facilitator: Richard Berkey, Michigan Technological University
Panelists: Catherine Bowman, Arizona State University; Jay Goldberg, Marquette University;
Bennett Ward, Virginia Commonwealth University

Nationally recognized capstone programs that involve multidisciplinary projects will share best practices in course design, project selection, design team facilitation, and assessment.

Panel 1B: Systems Thinking — SLA-2150
Facilitator: William Fortney, North Carolina State University
Panelists: Marcos Esterman, Rochester Institute of Technology; Tom Gannon, Worcester Polytechnic Institute; James Hacunda, Shire

Systems engineering methods are critical to the successful development of any complex system. Panelists will discuss ways to incorporate systems engineering concepts and tools into any capstone experience.

Panel 1C: Design for Non-profits in Capstone — GOL-1435
Facilitator: Jay McCormack, Rose-Hulman Institute of Technology
Panelists: Don Dekker, University of South Florida; Kevin Kochersberger, Virginia Polytechnic Institute and State University; Dan Phillips, Rochester Institute of Technology

Non-profits need technical help and students are often motivated when helping those with great need. Panelists will discuss issues encountered, rewards from relationships, and ways to establish partnerships.

Panel 1D: Capstone 101 — GOL-1610
Facilitator: Renee Rogge, Rose-Hulman Institute of Technology
Panelists: Susannah Howe, Smith College; Todd Polk, University of Texas-Dallas; Keith Stanfill, University of Florida

This session is targeted toward new capstone faculty. The panel will present best practices in teaching capstone. We also encourage experienced faculty to come and share ideas with the group as well.

12:15 p.m. – 1:45 p.m.

Keynote Luncheon: Dignity By Design: Delivering Lifespan Solutions for Global Equity & Inclusion — SLA-2210-2240

Creating for our comfort, providing for our existence, responding to the daily challenges that impact our lives, is a matter of Design. There has never been a more exciting or vital time for the presence of Design, and the need for "humanism" in design has never been more crucial to our future. By focusing our talents and resources on the needs of each individual as equal, Designers have given birth to a new order: "Inclusivity By Design." This "Design For All" philosophic challenge doesn't simply ask "Why?" but rather, "Why not?". This presentation will examine the potential for this new order by Design and explore the opportunities for our lifespan autonomy.

Speaker: Patricia Moore; President - MooreDesign Associates

Moore is an internationally renowned gerontologist and designer, serving as a leading authority on consumer lifespan behaviors and requirements. From 1979-1982, in an exceptional and daring experiment, Moore traveled throughout the United States and Canada disguised as women more than eighty years of age. With her body altered to simulate the normal sensory changes associated with aging, she was able to respond to people, products; places as an elder. Moore was named by ID Magazine as one of the world's 40 Most Socially Conscious Designers and was selected in 2000, by a consortium of news editors and organizations, as one of The 100 Most Important Women in America. Syracuse University selected Moore for a 2012 Honorary Doctorate for serving as a "guiding force for a more humane and livable world, blazing a path for inclusiveness, as a true leader in the movement of Universal Design." ABC World News featured Moore as one of 50 Americans Defining the New Millennium.

2:00 p.m. – 3:30 p.m.

Concurrent Panel Session 2

Panel 2A: What I Wish I Had Known Before My First Job — SLA-2140
Facilitator: Patsy Brackin, Rose-Hulman Institute of Technology
Panelists: Darius Fadanelli, Altair; James Hacunda, Shire; Erik Larson, Altair;
Pattie Moore, Moore Design Associates

The transition from student to full-time professional can be challenging. Industry representatives will discuss lessons learned in their career with student Capstone Design Conference participants — sharing their view on critical professional development, strategies, and professionalism that is essential for an entry-level engineer during their first two years.

Panel 2B: Safety and Risks in Capstone — SLA-2150
Facilitator: Fred Looft, Worcester Polytechnic Institute
Panelists: Scott Doremus, Worcester Polytechnic Institute; Kevin Kochersberger,
Virginia Polytechnic Institute and State University; Bridget Smyser, Northeastern University

Safety and risks apply to students as they design and execute projects as well as to the designs that are being created. Come join a discussion about safety concerns and methods for addressing these concerns.

Panel 2C: Entrepreneurship in Capstone — GOL-1435
Facilitator: Jay Goldberg, Marquette University
Panelists: Curtis Abel, Worcester Polytechnic Institute; Annie Abell, The Ohio State University;
John Ochs, Lehigh University; Bennett Ward, Virginia Commonwealth University

Capstone provides a natural opportunity for students to engage in entrepreneurial activities. In this panel, a mix of students and professionals will discuss best practices in supporting and encouraging student entrepreneurs.

Panel 2D: International Design Teams — GOL-1610
Facilitator: Dean Knudson, North Dakota State University
Panelists: Bastian Bachmann, Inwerken, Germany; Megan Bouret, Upper Great Plains
Transportation Institute; Jeewani Anupama Ginige, Western Sydney University;
Carsten Kleiner, University of Applied Sciences & Arts Hannover; Barbara Seegebarth,
Technische Universität Braunschweig; Steve Zahos, University of Illinois at Urbana Champaign

All panelists have been involved in international design exchanges and will present their experiences and suggestions.

3:30 p.m. – 4:00 p.m. **Break**

4:00 p.m. – 5:30 p.m. **Poster Session 1** — GLE-4480

Food and beverages will be available while you browse the posters and chat with the authors in the beautiful Gleason Hall Lobby.

5:30 p.m. – 6:00 p.m. **Break**

6:00 p.m. – 7:30 p.m. **Workshop Session 1 (with box dinner)**

Box dinners will be available in SLA-2210.

Workshop 1A: Rapid Prototyping the IoT with Texas Instruments — SLA-2140
Facilitator: Mark Easley, Texas Instruments

Access to high performance electronics, specialized sensing devices, and rapid prototyping tools is important for the success of many student capstone projects. Integrating wireless and cloud tools is also required for many modern applications. This calls for significant systems knowledge from the instructor that can be overwhelming to advise. Learn about how to access these tools for your program through TI and the key use cases of where to recommend the right tools and solutions to students for their electronics. Learn about the limitations of certain common solutions and how to navigate projects that require special support.

Workshop 1B: Modules for Demonstrating the New ABET Criteria while Infusing the Entrepreneurial Mindset — SLA-2150
Facilitators: Patsy Brackin, Rose-Hulman Institute of Technology; John Estell, Ohio Northern University; John Ochs, Lehigh University; Jennifer Young, The Kern Family Foundation

KEEN (KERN Entrepreneurial Engineering Network) has available modules with associated assessment instruments that address several of the new design, project management, and communication requirements in the new ABET Student Outcomes. Workshop participants will review available modules, select appropriate modules, and plan implementation to demonstrate ABET Student Outcomes.

Workshop 1C: Practical Project Management Instruction in Your Capstone — GOL-1435
Facilitator: Samuel Malachowsky, Rochester Institute of Technology

This workshop will provide participants with practical advice and resources for effectively carrying out project management instruction in the limited time available within capstone courses. Participants will discover why each of 5 competencies are important and have the opportunity to experience short example lessons. All attendees will receive sample curricula, lessons, slides, and books.

Workshop 1D: Developing Robust Forms of Reasoning for Engineering Decision-Making — GOL-1610
Facilitators: Emily Dringenberg, The Ohio State University; Annie Abell, The Ohio State University

Engineers make complex decisions, which require different combinations of rational, emotive and intuitive reasoning. This workshop will facilitate discussion on how engineering decision-making is taught in capstone design. Attendees will leave the workshop with new, research-based perspectives on how they can maximize students' development towards robust decision-making.

7:30 p.m. – 8:30 p.m. **News and Brews** — University Gallery

This informal session (with drink!) will provide an opportunity for capstone "newbies" to connect with more seasoned capstone colleagues for casual conversation. Whether you're new to capstone or have been around the capstone block (or you just like microbrews!), you are welcome to join in the discussion.

Capstone Conversation

Describe your most satisfying capstone project experience to another attendee.

DAY 2 — Tuesday, June 5, 2018

7:00 a.m. – 8:30 a.m.   **Registration & Breakfast** — SLA-2210-2240

8:30 a.m.– 12:15 p.m.   **Local Tours and Activities**

See program insert for local information and activities available in the RIT area this week!

9:00 a.m. – 10:30 a.m.   **Workshop Session 2**

Workshop 2A: Collaborative Problem Solving with Beagle Learning — GOL-1435
Facilitators: Turner Bohlen, Beagle Learning; Lindy Elkins Tanton, Beagle Learning; James Tanton, Beagle Learning; Carolyn Goettsch, Beagle Learning

Capstone courses play a critical role in helping students develop a wide range of skills not found in your typical lecture class – critical thinking, effective questions asking, dealing with ambiguity, and iteratively improving one's own understanding. We founded Beagle Learning to cultivate these skills. We use a simple methodology for complex problem solving based on inquiry and student-led learning techniques.

10:45 a.m. – 12:15 p.m.   **Workshop Session 3**

Workshop 3A: Geometric-Based Topological Optimization and Analysis for Capstone Projects — GOL-1435
Facilitators: Erik W. Larson, Altair; Darius Fadanelli, Altair

Inspire's modern user interface, backed by industry verified solver technology, allows for anyone to easily and quickly perform advanced static analysis and topological optimization and create lightweight yet structurally reliable designs. Attendees will see the full capabilities of Inspire and how it can fit into a capstone project, allowing students to create an optimized and structurally sound design. Attendees will be provided with flash drive containing a temporary license, installation of the software and free eBook on Inspire.

12:30 p.m. – 2:00 p.m.   **Birds of a Feather Lunch (box lunch, open seating by topics of interest)**

Please refer to the program insert for a list of topics & locations for each lunch discussion group. A sign-up sheet is located at the registration table! Pick up your box lunch at SLA-2210.

2:15 p.m. – 3:45 p.m.   **Concurrent Panel Session 3**

Panel 3A: Corporate Sponsorships — SLA-2140
Facilitator: Shraddha Sangelkar, Penn State Erie
Panelists: Kris Jaeger, Northeastern University; Vito Moreno, University of Connecticut; David Sly, Iowa State University; Matt Swenson, University of Idaho

How do you work with companies to enhance the experience for students, faculty, and the company, too? Join this panel for an informative session that will address many concerns for corporate sponsored projects.

Panel 3B: Grading or Evaluating Progress in Capstone — SLA-2150
Facilitator: Robert Hart, University of Texas-Dallas
Panelists: Jeewani Anupama Ginige, Western Sydney University; Daria Kotys-Schwartz, University of Colorado Boulder; John Parmigiani, Oregon State University; Gregory Watkins, California State University Chico

Do you evaluate process, product, or some combination of both? Are there other metrics for evaluating student achievement in capstone? Come and share your ideas.

Panel 3C: Professional Skills in Capstone Design — GOL-1435
Facilitator: Marie Paretti, Virginia Polytechnic Institute and State University
Panelists: Denny Davis, Verity Design Learning; Ramana Pidaparti, University of Georgia; Alisha Sarang-Sieminski, Olin College

Major publications and industry leaders have stressed the need for engineers with enhanced professional skills. Join the discussion about ways to meet this need.

Panel 3D: Encouraging Creativity in Capstone — GOL-1610
Facilitator: Patsy Brackin, Rose-Hulman Institute of Technology
Panelists: Megan Conrad, University of Detroit Mercy; Don Dekker, University of South Florida; Russell McMahon, University of Cincinnati; Pattie Moore, Moore Design Associates

How can you encourage engineering students to participate in the creative process? How can you ensure that students generate multiple alternatives? This panel will provide approaches for encouraging creativity in capstone design.

3:45 p.m. – 4:00 p.m.   **Break**

4:00 p.m. – 5:30 p.m.   **Poster Session 2** — GLE-4480

Food and beverages will be available while you browse the posters and chat with the authors in the beautiful Gleason Hall Lobby.

5:30 p.m. – 6:00 p.m.   **Break**

6:00 p.m. – 7:30 p.m.   **Workshop Session 4 (with box dinner)**

Box dinners will be available in SLA-2210.

Workshop 4A: Assessment of Motivation in Capstone Design — SLA-2140
Facilitators: Peter Rogers, The Ohio State University; Denny Davis, Verity Design Learning

Motivation is important but seldom addressed in undergraduate engineering curricula. Tools for assessing and communicating student motivation in capstone project classes can identify effective instructional strategies and stimulate improved motivation-related behaviors. This workshop will enable participants to learn about assessments and feedback mechanisms for student motivation in team projects.

Workshop 4B: Have Cart, Will Stream — SLA-2150
Facilitator: Jim Vallino, Rochester Institute of Technology

Distributed teams, as remote project sponsors or teams at multiple institutions, are part of the capstone experience. This necessitates having resources for synchronous meeting communication and live streaming presentations. This workshop's goal will be to discuss and demonstrate available resources including the "streaming cart" that RIT software engineering uses.

Workshop 4C: Synergizing Product, Process, and Performer Needs in Externally-Sponsored Capstone Projects with Right-Sized Design Methodologies — GOL-1435
Facilitators: Chuck Pezeshki, Washington State University; Steve Beyerlein, University of Idaho

Design methodologies used in industry have proliferated, and offer different student learning experiences. This means capstone faculty need flexibility in selection of design processes used to manage externally-sponsored capstone projects. This workshop utilizes role-playing scenarios to help capstone instructors analyze lean/agile, waterfall, and IDEO methodologies in optimizing student learning and project outcomes.

Workshop 4D: Quick and Easy Idea Generation Techniques — GOL-1610
Facilitators: Darrell Kleinke, University of Detroit Mercy; Megan Conrad, University of Detroit Mercy

Brainstorming isn't enough. Structured techniques for idea generation will enable teams to come up with unique, innovative design options. This workshop will introduce and demonstrate several quick and effective techniques aimed at augmenting idea generation for student led design projects.

7:30 – 8:30 p.m.   **Dessert Break** — University Gallery

Capstone Conversation

What's the best change you ever made to your capstone course?

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DAY 3 — Wednesday, June 6, 2018

6:30 a.m. – 7:30 a.m. **Walk/Run** — Meet in the SLA Lobby

An informal gathering of attendees who are interested in taking a walk or run around the RIT campus.

8:00 a.m. – 9:00 a.m. **Registration & Breakfast** — SLA-2210-2240

9:00 a.m. – 10:30 a.m. **Concurrent Panel Session 4**

Panel 4A: ABET 1-7: How Is Capstone Design Affected? — SLA-2140
Facilitator: Denny Davis, Verity Design Learning
Panelists: Patsy Brackin, Rose-Hulman Institute of Technology; John Estell, Ohio Northern University; Steve Zahos, University of Illinois at Urbana Champaign

The new ABET Student Outcomes, 1-7, have an expanded definition of design. What does this new definition imply for capstone courses? How can a program demonstrate that they are meeting the outcomes? The panel includes experienced team chairs, program evaluators, and program ABET coordinators.

Panel 4B: Nifty Ideas and Surprising Flops — SLA-2150
Facilitator: Susannah Howe, Smith College

This rapid-fire session will feature a collection of "nifty ideas" and "surprising flops" from capstone design. Each presenter will briefly share a nifty/flop, followed by Q&A from the audience. Time permitting, walk-ons from the audience will be welcome – bring an idea to contribute!

Panel 4C: Team Formation — GOL-1435
Facilitator: Shraddha Sangelkar, Penn State Erie
Panelists: Julie Ford, New Mexico Institute of Mining and Technology; Richard Parker, University of Colorado; Matthew Swenson, University of Idaho

There are many approaches to team formation: assign randomly, assign based on skills, assign based on student preference, have students bid for projects, and others. Join the panel to discuss the pros and cons of different approaches.

Panel 4D: Difficult Conversations — GOL-1610
Facilitator: Keith Stanfill, University of Florida
Panelists: Gregory Kremer, Ohio University; Renee Rogge, Rose-Hulman Institute of Technology

One of the challenges of teaching design is the difficult conversations that a design instructor sometimes has to have with teams or team members. Join your capstone colleagues in a dynamic session where we role-play some situations and discuss strategies as a group for helping faculty manage these difficult conversations.

10:30 a.m. – 11:00 a.m. **Break**

11:00 a.m. – 12:30 p.m. **Concurrent Panel Session 5**

Panel 5A: Roles and Responsibilities on Teams in Capstone — SLA-2140
Facilitator: Brian Novoselich, United States Military Academy
Panelists: Denny Davis, Verity Design Learning; Kimberly Demoret, Florida Institute of Technology; Daria Kotys-Schwartz, University of Colorado Boulder; Marco Nunez Penn State Erie, Student

There is general agreement that having team members perform different roles can improve the productivity of a team. Who should determine the roles? Who should assign the roles? What are some approaches that improve productivity? Come and share your ideas.

Panel 5B: What I Wish I Had Known Before I Took Capstone — SLA-2150
Facilitator: Renee Rogge, Rose-Hulman Institute of Technology
Panelists: Invited Students Attending the Conference

Students have varying expectations about their capstone experience. Come and hear reflections from students about what they wish they had known before they started.

Panel 5C: Performing Design Research in Capstone Classes — GOL-1435
Facilitator: Steve Beyerlein, University of Idaho
Panelists: Mohammad Fazelpour, University of Maryland; Shraddha Sangelkar, Penn State Erie University; Joshua Summers, Clemson University

This panel introduces and discusses formal methods for engineering design research that can be applied through capstone design projects.

12:45–2:00 p.m.   **Closing Lunch** — SLA-2210-2240

Capstone Conversation

Don't forget! Contribute your "most important takeaways" sticky notes at the end of each panel session.

WEDNESDAY, JUNE 6

PROFESSIONAL POSTERS — By Day

Poster ID's, M#-# or T#-# indicate the featured day (Mon. or Tues.) and location within the poster area, as well as the paper number.

Poster ID-Paper No.	Title	Authors (*Primary Contact)
M01-46	The Language of Capstone: A Translator	Elizabeth DeBartolo*, John Kaemmerlen, James Vallino, Reginald Rogers, Dan Harel
M02-12	A Communication-Focused Four-Semester Design Requirement	Julie Ford*
M03-31	Quantitative Literacy in Capstone Design	Bridget Smyser*, Andrew Gouldstone
M04-23	The Unintended Consequences of Capstone as a Writing Intensive Course	Sharon LeRoux, John Parmigiani*
M05-40	Coordinating Opportunistic Interdisciplinary Projects Across Single-Discipline Capstone Courses	Catherine Bowman*
M06-45	Enterprise: A Multi-year, Interdisciplinary Learning Experience at Michigan Technological University	Richard Berkey*, Zachary Fredin
M07-28	An Engineering / Entrepreneurship Capstone Collaboration: Providing Real-World Experiential Learning	Bennett Ward*, Susan Coombes
M08-49	Emerging Leadership Content in Capstone Design Curriculum at the University of Georgia	Stephan Durham, Jason Christian, Cheryl Gomillion, James Kastner, Peter Kner, Kyle Johnsen, Sidney Thompson, Tom Lawrence, Brandy Walker, Angel Jackson, Ramana Pidaparti*
M09-50	Sprint+PDCA Approach to Improving Project Management Skills and Mindset in Capstone Design	Gregory Kremer*
M10-52	A Qualitative Investigation of Success and Challenges with Team Roles in Capstone Design	Daria Kotys-Schwartz*, Daniel Knight, Julie Steinbrenner
M11-29	Formation of Interdisciplinary Teams in Engineering Capstone Courses using a Project Fair Format	Matthew Swenson*, Michael Maughan, Daniel Cordon, Edwin Odom, Steve Beyerlein
M12-26	Relating Shared Leadership to Team Effectiveness	Brian Novoselich*, David Knight
M13-14	Conflict in Capstone Design Teams: Sources, Management, and the Role of the Instructor	Ada Hurst*, Mehrnaz Mostafapour
M14-61	Interest-Based Capstone Team Formation	Richard Parker*
T01-57	International, Low-Resource Design Projects: Building Capacity Abroad	Kevin Kochersberger*
T02-30	Mighty Minutes for Professional Learning	Denny Davis*
T03-37	Team Time Cards: a Tool to Increase Accountability and Reduce Social Loafing in Senior Design	Kimberly Demoret*
T04-53	Exploring Humanitarian Engineering Senior Design as a Community of Practice	Christopher Gewirtz*, Ashley Taylor, Robin Ott
T05-60	Making experiences matter - attempts to increase recall and transfer in experiential learning	Gregory Kremer*, Timothy Cyders, Jane Oberhauser, Joseph Juratovac
T06-47	Winning Day One: Setting Up Capstone Students for Success	Alisha Sarang-Sieminski*, Alexandra Coso Strong, Jason Woodard, Samantha Michalka
T07-32	Client Interaction Rubrics: Supporting Student Professionalism on Client-Based Projects	John Estell*, Susannah Howe, B. Kris Jaeger-Helton
T08-36	Running Capstone Like a Business – Focus on the Client	David Sly*
T09-54	Leveraging Industry Sponsorship as a Catalyst for Transformational Change in a Computer Science & Engineering Senior Capstone Design Program	Christopher McMurrough*, Christopher Conly
T10-55	Awarding Failing Grades in a Senior Capstone Design Course	Gregory Watkins*
T11-43	Successful Capstone Design Projects Using Peer Review Assessment	Fernando Rios*, Rocio Alba-Flores
T12-16	Individual Grading in Groups: A Capstone Project Practice	Jeewani Anupama Ginige*
T13-58	Preliminary Results from a Study Investigating the Transition from Capstone Design to Industry	Susannah Howe*, Laura Rosenbauer, Julie Ford, Nicholas Alvarez, Marie Paretti, Christopher Gewirtz, Daria Kotys-Schwartz, Daniel Knight, Cristian Hernandez
T14-56	Post-Graduation Assessment of the Effectiveness of an Industrially Sponsored Senior Design Capstone Course	Vito Moreno*, Bryan Weber, Thomas Barber
T15-59	Integrating Rehabilitation Engineering into the Mechanical Engineering Capstone Design Course at the University of South Florida	Don Dekker*, Stephen Sundarraao, Rajiv Dubey

STUDENT POSTERS — By Day

Student Poster ID's, sM# or sT#, correspond to the featured day (Mon. or Tues.) and location within the poster area.

Poster ID	Title	Student Authors	School
sM1	Handheld, Inexpensive Cocoa Bean Moisture Meter	Bradley Beard, Kevin Acken, Chris Lawrence, Eric Barrow	North Carolina State University
sM2	Fence Board Dog Ear Machine, sponsored by Mendocino Forest Products	Ryan Denton, Erik Lower, Rogelio Madrigal, Federico Palafox, Gavino Segura	California State University Chico
sM3	Hybrid VTOL Drone	Anthony Walker, Marco Nunez	Penn State Erie
sM4	Macular Degeneration Evaluation System	Erika Ackerman, Lexa Brossart, Shelley Meyer, Rory Morrison-Colvin , Ryan Nolcheff	University of Arizona
sM5	Internal Hip Distraction/Offloading Device	Emmanuel Aykara, Amreek Saini, Basil Alias	University of Texas at Dallas
sM6	Relay Bike Share: Bike Smart, Restock Smart	Elizabeth Ball, Suzanne Kastens, Heer Patel, Kaitlin Rizk	Georgia Institute of Technology
sM7	BOSE PERSONAL RADAR	Benjamin Welch, Marjorie Pickard, James Kiessling, Christian D'Ovidio	University of Rhode Island
sM8	The Maestro Project	Ronald Duquette, Emily Kirven	University of Michigan
sM9	Multi-Implement Grooming System	Steve Lehmann	Michigan Technological University
sM10	Design of Sublimation Procedures for OLED Chemicals	Rachel Monfredo	University of Rochester
sT1	Reducing Edema One Foot at a Time	Megan Conrad, Darrell Kleinke, Molly Laird	University of Detroit Mercy
sT2	Design and Development of an On Board Intelligent Device for Public Transportation System	Abdul Rehman	Habib University
sT3	Custom Microwave Tuner for Life Support Applications in Space	William Aldridge, Alec Hydock	Penn State Erie
sT4	Autonomous People Mover	Robert Relyea, Jeffrey Barker, Thomas Harten	Rochester Institute of Technology
sT5	One-Handed Smartphone Case	Shaan Patel, Carlton King	Northeastern University
sT6	Bench-Scale Process Design for CO2 Separation and Transportation for Sustainable Large-Scale Algae Growth	Jason Wu, Emma Hamilton, Evgeniya Yatsenko, Natalia Diaz, Nicole Marmol, Daniel Clayton	University of Florida
sT7	Multidisciplinary Team Assignment Process Improvement	Ann Brautigam, Madeline Galvin, Joseph Yeiter	Rochester Institute of Technology
sT8	Design of Bank Protection for the Williamsburg Mill River Greenway	Laura Rosenbauer	Smith College
sT9	Image Processing from a Camera Type Device	Harish Sunak	University of Rhode Island
sT10	Improving Usability and Clinical Outcomes in Neuraxial Access Procedures	Cassidy Wang, Dev Mandavia, Alec Bills, Marci Medford, Lucas Miller	Georgia Institute of Technology

POSTER LOCATION — 4th Floor, Kate Gleason College of Engineering (GLE)
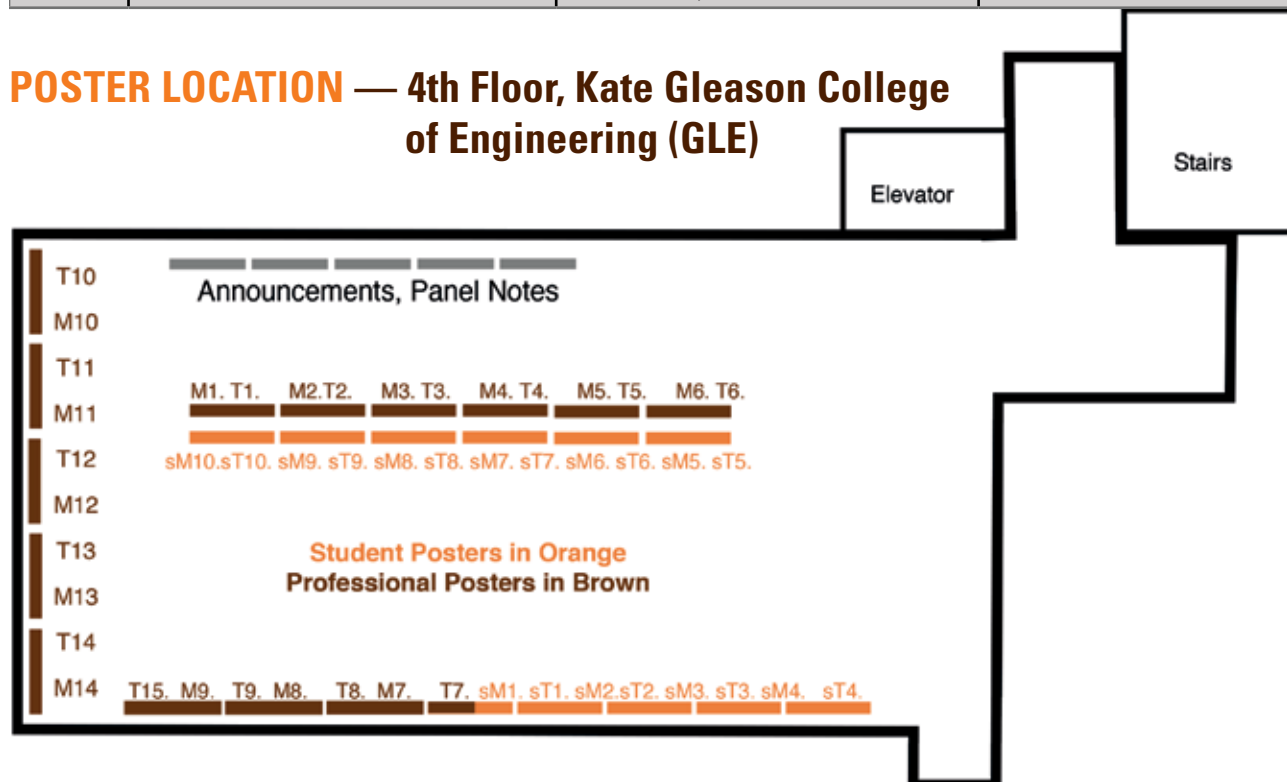
POSTER SESSION

Quests

What is better than having a little fun and being a little silly at a professional conference? The great success of Quests from the 2014 and 2016 Capstone Design Conferences led us to continue to support the spirit of play and give gentle nudges to engage with other participants in fun ways by bringing back Quests for a third round! The quests are designed to encourage participants to fully experience the conference, make social and networking connections that otherwise might not occur, explore some local activities, and generally have fun. Look for the Quest table in the exhibit hall to get more information and claim prizes or be entered into prize raffles based on the quests you've completed. And look for evidence of completed quests on people's name tags to find others engaging in quests.

Exhibitors

Platinum-Level Sponsor:

Texas Instruments

Silver-Level Sponsors:

Altair

ASTM International

Autodesk

KEEN

VentureWell

Other Exhibitors:

Beagle Learning

EduSourced

Mechanical Design (David Ullman)

Populy

Exhibits will be open in the lobby of Slaughter Hall (SLA) throughout the conference: Monday 10am-6pm, Tuesday 8:30am-6pm, and Wednesday 9am-2pm.

Capstone Conversation

What is the craziest thing you've ever heard spoken in a capstone team meeting?

RIT Campus
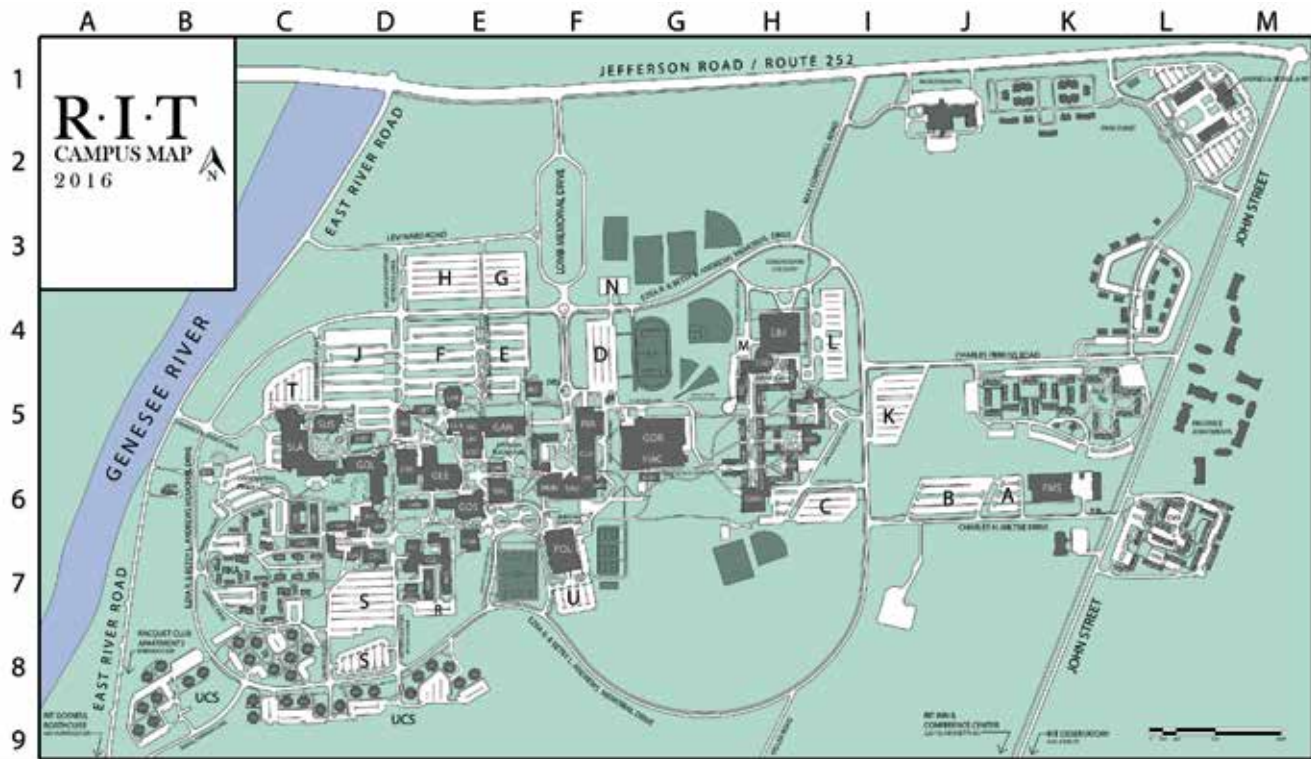
An interactive campus map is available at www.rit.edu/fa/facilities/maps

Conference Buildings

**Panels & Workshops
(SLA & GOL are connected)**

Poster Sessions

**News & Brews,
Dessert**

GLE

GOL

SLA

Vignelli Center for Design Studies
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The Mechanical Design Process
6th Edition
By David G. Ullman

Beagle