



SySTEAM mini-conference

August 14th & 15th, 2025

Virtual/online

Informational packet and conference guide

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Welcome

An open letter to this year's mini-conference participants

Dear mini-conference attendees:

Thank you for registering for the 2025 SySTEAM mini-conference! It is a delight to welcome back so many of our prior mini-conference participants from the inaugural SySTEAM mini-conference in 2023, as well as to welcome in all of our new attendees who are joining us for the first time. Regardless of whether you are an inveterate SySTEAM community member, a curious colleague looking to learn more about the SySTEAM Initiative, or simply someone with a passion for systems education, it is exciting to have you here for this event.

Much like SySTEAM's last mini-conference from two years ago, the 2025 SySTEAM mini-conference is meant to serve as a convocation for systems-minded individuals around the world to gather for a shared exploration of systems competency education and STEM/STEAM learning, in furtherance of SySTEAM's vision for "improving education for all students, everywhere". As such, it is hoped this year's mini-conference (and those that follow) will help foster ties within the global systems education community and galvanize idea exchange among stakeholders who – due to circumstances such as different specialities, professions, or geographic locations – might not typically get the chance to interact and collaborate. This year's mini-conference program, which features a mix of commentary, collaboration, and cutting-edge content, will undoubtedly provide ample fodder for achieving that goal through thought-provoking discussion and friendly debate among attendees.

The last SySTEAM mini-conference in 2023 proved to be a exciting demonstration of the viability of SySTEAM's goals and aspirations towards helping strengthen and energize the systems education community. In what proved to be an amazing showcase of the enthusiasm and expertise that the global systems education community brings to the discussion table, SySTEAM's inaugural mini-conference drew in a diverse, multi-disciplinary audience of over two hundred participants from around the world and across the STEAM career pipeline. Indeed, the exuberant reception to the 2023 mini-conference (and numerous requests in the following months for an encore event) is a major reason that the SySTEAM mini-conference is being held again this year in what will likely continue to be a biennial event series.

This year's event has been put together with an eye towards recapturing the energy of the last mini-conference, while still delivering fresh content reflective of the latest priorities and trends that characterize the world of systems education in 2025. Attendees

can therefore look forward to enjoying a number of well-loved SySTEAM staples that have been brought back by popular demand (themed workshop sessions, community-favorite discussion topics, etc.), as well as newly-debuted mini-conference elements such as technical session context overviews and special guest speakers. The 2025 mini-conference technical sessions similarly feature a blend of familiarity and novelty, with a number of our 2023 mini-conference presenters returning to the (virtual) podium with new content alongside first-time mini-conference speakers whose presentations bring fresh perspectives to familiar discussion areas.

This year's mini-conference also introduces the addition of plenary sessions (where we'll be hearing from guest speakers from external groups/organizations that are interfacing with SySTEAM on ongoing or upcoming endeavors) to serve as a complement to the individual-level collaboration & coordination that attendees get to do during the mini-conference's workshop sessions. Indeed, attendees can look forward to sharing in the excitement of SySTEAM officially announcing the details of its first-ever in-person workshop session (to be held on the 5th anniversary of SySTEAM's debut 2021 workshop) as one of the many highlights in store during this year's plenaries.

In short, it is clear that the content for the 2025 SySTEAM mini-conference promises to make for an exciting and edifying attendee experience. On behalf of the SySTEAM Initiative, I hope you find this year's mini-conference to be as enjoyable as it is enlightening, and I look forward to seeing you on Zoom (and/or online on the SySTEAM Discord community hub) for the mini-conference on August 14th and 15th.

Warm regards,

Caitlyn A. K. Singam

SySTEAM Program Director

Key links & information

Conference access & materials

See the “Participation Information” section of this packet for additional details.

Key documents

- **Mini-conference schedule:** <https://tinyurl.com/2mpyuv6w>
 - Also included on the following pages of this info packet
- **Pre-reading packet:** <https://tinyurl.com/2zm4h2f5>
 - Compendium of posters/papers that are being presented as part of this year’s mini-conference technical program.
- **SySTEAM Code of Ethics:** <https://bit.ly/49mtakH>
 - Addresses SySTEAM’s standards for professional conduct

Zoom links

Registered attendees should have received two separate Zoom emails (one for Day 1 and one for Day 2) with **personalized** login links for the mini-conference. The Zoom links were sent out to all mini-conference registrants on Wednesday, August 13.

If you cannot find the Zoom login information that was emailed to you, and need to re-register for Day 1 and/or Day 2 mini-conference Zoom access, you can do so via the following links:
<https://tinyurl.com/47b72v7b> (Day 1, Thu August 14); <https://tinyurl.com/397xpu28> (Day 2, Fri August 15).

SySTEAM Discord server

- **Sign-up/registration:** <https://bit.ly/3NVLwjV>
- **Access for registered users:** <https://bit.ly/3XxCVqI>

YouTube livestream

- **Day 1:** <https://tinyurl.com/2veucabs>
- **Day 2:** <https://tinyurl.com/38dhrm26>

Contact and additional information

SySTEAM Initiative

SySTEAM is a volunteer-run INCOSE initiative. Participation in SySTEAM is completely free for all interested individuals; INCOSE membership is encouraged but not required in order to be considered a full SySTEAM community member.

- **Primary contact:** Caitlyn Singam, SySTEAM Program Director
 - **Email:** Caitlyn.Singam@incose.net
 - **Via the SySTEAM Discord server:** @csingam or @Moderator
- **Main page:** <https://www.incose.org/systeam>
 - **Join SySTEAM:** <https://www.incose.org/systeam#join>
 - **Community meetings:** <https://bit.ly/3B8Waf7>
 - Bimonthly on Thursdays, 10AM to noon Eastern Time; see SySTEAM webpage for details and scheduling

International Council on Systems Engineering (INCOSE)

Major SySTEAM announcements often appear on the webpages linked below.

- **Main page:** [incose.org](https://www.incose.org)
- **Social media pages:**
 - **Twitter:** [@incose_org](https://twitter.com/incose_org)
 - **Facebook:** <https://www.facebook.com/INCOSE/>
 - **LinkedIn:** <https://www.linkedin.com/company/incose>

Agenda

Day 1: Thursday, August 14th, 2025

All times are listed in Eastern Time. Please be mindful of any time-zone differences when planning your attendance/participation.

2025 SySTEAM mini-conference						
ID	Item description	Speakers (marked in bold)	Type	Start	End	Duration (hrs)
1	Day 1			11:00 AM	5:00 PM	6:00
1.1	Welcome & overview			11:00 AM	11:25 AM	
1.1.1	Opening remarks: welcome, mini-conference overview, & Day 1 logistics	SySTEAM	Admin	11:00 AM	11:25 AM	0:25
1.2	Technical session 1: the importance of systems competencies			11:25 AM	12:30 PM	
1.2.0	Session intro/SySTEAM context	SySTEAM	SySTEAM	11:25 AM	11:30 AM	0:05
1.2.1	Children's after school club on systems thinking and sustainability	Adriana D'Souza	Paper/poster	11:30 AM	12:00 PM	0:30
1.2.2	The value of SySTEAM for interdisciplinary AI pattern creation	Rock Mendenhall & Steven Simske	Paper/poster	12:00 PM	12:30 PM	0:30
1.3	The state of SySTEAM: current & future plans			12:30 PM	1:00 PM	
1.3.1	SySTEAM's past and present work (& upcoming opportunities to get involved)	SySTEAM	SySTEAM	12:30 PM	1:00 PM	0:30
1.4	Plenary session 1			1:00 PM	1:45 PM	
1.4.1	[Guest speaker] Overview of The Guide to the Systems Engineering Body of Knowledge (SEBoK)	Nicole Hutchison (SEBoK Editor-in-Chief)	Guest speaker	1:00 PM	1:45 PM	0:45
	Coffee break (+ optional attendee networking)			1:45 PM	2:00 PM	0:15
1.5	Workshop 1: revitalizing systems competency education for the digital age			2:00 PM	3:05 PM	
1.5.1	Workshop logistics & discussion theme intro	SySTEAM	Admin	2:00 PM	2:10 PM	0:10
1.5.2	Workshop discussion (small groups/breakout rooms)	All attendees	Attendees	2:10 PM	2:55 PM	0:45
1.5.3	Roundtable discussion of findings (entire group)	All attendees	Attendees	2:55 PM	3:05 PM	0:10
	Coffee break (+ optional attendee networking)			3:05 PM	3:20 PM	0:15
1.6	Technical session 2: integrating systems competency development into educational practice			3:20 PM	4:55 PM	
1.6.0	Session intro/SySTEAM context	SySTEAM	SySTEAM	3:20 PM	3:25 PM	0:05
1.6.1	Can employability skills be developed and measured? The Helix Employability Skills Measurement Framework	Tom McDermott & Nicole Hutchison	Paper/poster	3:25 PM	3:55 PM	0:30
1.6.3	Modeling beyond the V: using model-based systems engineering and STEAM goals to unlock creativity in systems engineering education	Christopher Green	Paper/poster	3:55 PM	4:25 PM	0:30
1.6.4	Tools to manage complexity: a case study in teaching model based systems engineering & requirements management to non-systems engineers	Nick Pickering	Paper/poster	4:25 PM	4:55 PM	0:30
1.7	Day 1 closeout			4:55 PM	5:00 PM	
1.7.1	Day 1 summary & preview for Day 2	SySTEAM	Admin	4:55 PM	5:00 PM	0:05
	Adjournment (+ optional attendee networking)			5:00 PM	5:00 PM	

Agenda

Day 2: Friday, August 15th, 2025

All times are listed in Eastern Time. Please be mindful of any time-zone differences when planning your attendance/participation.

2025 SySTEAM mini-conference						
ID	Item description	Speakers (marked in bold)	Type	Start	End	Duration (hrs)
1	Day 2			9:00 AM	1:00 PM	4:00
2.1	Welcome & overview			9:00 AM	9:10 AM	
2.1.1	Opening remarks: Day 1 recap & Day 2 logistics	SySTEAM	Admin	9:00 AM	9:10 AM	0:10
2.2	Technical session 3: cultivating future systems engineers & improving the STEAM pipeline			9:10 AM	10:15 AM	
2.2.0	Session intro/SySTEAM context	SySTEAM	SySTEAM	9:10 AM	9:15 AM	0:05
2.2.1	The SE competency conundrum	David Ward & Victor Bertolazzo	Paper/poster	9:15 AM	9:45 AM	0:30
2.2.2	Letters to Self: cultivating STEAM self-efficacy and engagement through storytelling	Federica Robinson-Bryant, Stueti Gupta, & Alice Squires	Paper/poster	9:45 AM	10:15 AM	0:30
2.3	Workshop 2: interconnecting education & employment in systems engineering			10:15 AM	10:55 AM	
2.3.1	Workshop logistics & discussion theme intro	SySTEAM	Admin	10:15 AM	10:20 AM	0:05
2.3.2	Workshop discussion (small groups/breakout rooms)	All attendees	Attendees	10:20 AM	10:50 AM	0:30
2.3.3	Roundtable discussion of findings (entire group)	All attendees	Attendees	10:50 AM	10:55 AM	0:05
	Coffee break (+ optional attendee networking)			10:55 AM	11:10 AM	0:15
2.4	Plenary session 2			11:10 AM	11:45 AM	
2.4.1	[Guest speaker] Overview of the Cornell Systems Summit (& announcement of an in-person SySTEAM workshop session)	Cliff Whitcomb (Cornell Systems Summit organizer)	Guest speaker	11:10 AM	11:45 AM	0:35
2.5	Technical session 4: systems engineering pedagogy in practice, in classrooms & beyond			11:45 AM	12:50 PM	
2.5.0	Session intro/SySTEAM context	SySTEAM	SySTEAM	11:45 AM	11:50 AM	0:05
2.5.1	Introducing scientists and business professionals to systems engineering and systems thinking	Ali Nasserri	Paper/poster	11:50 AM	12:20 PM	0:30
2.5.2	Safety Third follow-up: updating the project-based approach to systems engineering education	Chris Brown	Paper/poster	12:20 PM	12:50 PM	0:30
2.6	Closing			12:50 PM	1:00 PM	
2.6.1	Closing remarks & next steps	SySTEAM	Admin	12:50 PM	1:00 PM	0:10
	Adjournment			1:00 PM	1:00 PM	

Conference information

Overview

Summary

The INCOSE SySTEAM mini-conference is a free, two-day online event intended to provide individuals from around the globe with the opportunity to convene, discuss, and exchange ideas relating to the intersection between systems STEM/STEAM education and systems competencies through a combination of contributed talks/papers/posters and roundtable discourse sessions.

Objective

The aim of the event is to provide an opportunity for SySTEAM community members and other systems-minded individuals from around the globe to take center stage in sharing, discussing, and showcasing ideas and work relevant to SySTEAM's interests. Attendees are invited to interact and collaborate with their colleagues from around the world in characterizing, contemplating, and challenging the existing and emerging ideas in the realm of systems competency education, in furtherance of SySTEAM's long-term goal of "improving education for all students, everywhere".

Participation information

The SySTEAM mini-conference is a fully virtual event that is open to all members of the public. This year's mini-conference once again has attendees joining us from across the globe to participate in this year's technical sessions, Q&As, and workshop discussions. While the logistical challenge of making real-time and near-real-time participation feasible for audience members joining in from a variety of time zones is not a trivial one, the intent is to ensure that the SySTEAM mini-conference is accessible to as wide an audience as possible. Attendees therefore have multiple options for participating in the mini-conference, all of which are available at no cost to participants.

Join via Zoom

- **Link:** Check your email for two separate Zoom invites – one for Day 1 & one for Day 2. Please note that Day 1 and Day 2 do not use the same Zoom links.

All registered attendees should have received two separate emails with Zoom invites – one containing the Zoom link for Day 1 of the conference (Thursday), and the second for Day 2 (Friday). The best way to participate in the mini-conference is by joining us live via the appropriate Zoom link for each day, during the times listed on the mini-conference program (please see the agenda included in this packet). In addition to being able to watch the mini-conference's technical presentations in real time, participants on Zoom can join in on roundtable

discussions, contribute ideas during workshop discussions, ask questions during question & answer (Q&A) sessions with mini-conference speakers, and network with their fellow attendees during breaks. Mini-conference attendees are not required to have their cameras and microphones on while participating via Zoom, and have the option of using the in-meeting chat feature to send typed messages in lieu of unmuting their microphone feed; however, microphone access is strongly recommended for individuals interested in participating in group discussions during the workshop sessions. Please note that the mini-conference presentations and associated Q&A sessions will be recorded & livestreamed; parts of the conference held in Zoom breakout rooms, including networking sessions (held during breaks) and some workshop discussions (where participants are split up into small groups) may not be recorded due to limitations of the Zoom platform.

Individuals participating via Zoom may wish to also participate in discussion on the SySTEAM Discord (see details below) for a more complete mini-conference experience.

- *If you cannot find the Zoom login information that was emailed to you, you will need to be re-issued Zoom login links for the mini-conference. You can use the following links to re-register for Zoom access to each day of the mini-conference.*
 - To get access to Day 1, Thu August 14: <https://tinyurl.com/47b72v7b>
 - To get access to Day 2, Fri August 15: <https://tinyurl.com/397xpu28>

Watch on YouTube

- **Links:** tinyurl.com/2veucabs (Day 1), tinyurl.com/38dhrm26 (Day 2)

The mini-conference will also be viewable on YouTube. Individuals who wish to follow the event on YouTube can watch the conference in real time via a livestream, or can alternatively view the recordings at a later time. Livestream viewers may wish to note that there may be up to a 20-second delay between the Zoom feed and the YouTube stream. Please note that parts of the conference held in Zoom breakout rooms, including networking sessions (held during breaks) and some workshop discussions (where participants are split up into small groups) may not be livestreamed due to technical limitations; individuals wishing to interact in real time with the mini-conference speakers or their fellow attendees are encouraged to participate directly via Zoom instead. Individuals watching the livestream may wish to also participate in discussion on the SySTEAM Discord (see details below) for a more complete mini-conference experience.

The YouTube livestreams from both days of the event will remain available on YouTube after the end of the mini-conference for individuals who wish to view them later and/or are unable to participate live due to schedule conflicts.

Participate via Discord

- **Link:** bit.ly/3NVLwjV [new user sign-up], bit.ly/3XxCVqI [SySTEAM Discord members]

Individuals wishing to participate in mini-conference discussion asynchronously may do so via the SySTEAM community Discord. Ahead of the mini-conference, and during the mini-conference itself, the Discord will have a dedicated section for associated discussion, which will include the following mini-conference specific channels:

- **#miniconference-discussion**: a general space for mini-conference attendees to interact and engage in topical discussion related to the mini-conference. a dedicated channel for posting questions for our conference speakers and for generally discussing ideas & content directly related to the conference.
- **#miniconference-networking**: a place for conference attendees to introduce themselves and to network with each other asynchronously (in supplement to the networking opportunities included in the main conference program).
- **#2025-conference-info**: a read-only channel for conference announcements, logistical information, and materials.

Individuals who are unable to attend parts of the live conference are welcome and encouraged to use the above-mentioned channels to interact asynchronously with attendees of the live mini-conference. Attendees can use the **#miniconference-discussion** channel in particular to discuss conference content (including the papers and posters in the pre-reading packet), and to send in questions they'd like to ask our mini-conference speakers during the mini-conference's live Q&A sessions.

Additional accessibility options

- **Dial-in (audio only) participation in the live mini-conference**: participants with limited internet access or without access to a microphone/speaker may wish to dial-in via phone in order to get audio-only access to the live conference. Dial-in access can be used in conjunction with, or independently from, video access to the meeting via the Zoom link or the YouTube livestream. Dial-in information is provided in the Zoom invitation emails sent out to participants before the conference, alongside the information for standard Zoom participation over the web.
- **Automated captions/transcripts**: automated captions are available for participants attending the live conference via Zoom. Please note that background noise and other factors may affect the quality of the captions.
- **Text-based Q&A**: participants who do not have microphone access, or who otherwise are not able to/do not wish to ask questions verbally, have the option to type their questions for the conference presenters.

Selection process for papers & posters

Review process

This year's SySTEAM mini-conference includes a contributed content in both poster and paper format. Content for this year's SySTEAM mini-conference was selected via a peer review process, with feedback provided by from various experts in the SySTEAM community who kindly volunteered their time and expertise to help review submissions. Each submission was peer reviewed by 2-3 independent peer reviewers, who were matched with each submission based on their professional backgrounds and verifiable areas of relevant expertise/knowledge they indicated on their peer reviewer volunteer applications. In the interest of fairness, SySTEAM utilized a double-blind review process, and kept all submissions and reviewers anonymous during the review process. (References to an author's home institution and other pieces of identifying information were redacted from all submissions prior to being sent out for review). Selection decisions were made based on both (1) the scores reviewers gave each submission, and (2) any written reviewer feedback.

Scoring rubric

Peer reviewers were asked to score submissions on a scale of 1-5 for the following criteria:

- **Scope:** alignment with conference objectives
- **Significance/originality:** impact on the field of systems education and novelty compared to pre-existing academic literature on the same subject
- **Technical merit:** quality of argument and/or evidence supporting the author(s)' conclusions
- **Clarity/organization:** clarity of the author(s)' intended objectives and of the method(s)/approach used to substantiate those objectives
- **Readability:** accessibility of the material to an interdisciplinary audience (minimal use of domain-specific jargon, and grammatical correctness).

Results

The selection process was particularly stringent this year's mini-conference in order to ensure that all selected presenters could be offered longform (30-minute) presentation timeslots, rather than having to limit poster presenters to 10-minute timeslots as was done previously. Although not all of the submissions that SySTEAM received this year could be accepted, the efforts of all authors whose submitted content for consideration are nonetheless appreciated. Authors whose content was not selected for inclusion in the mini-conference are encouraged to consider revising their content for submission to a future SySTEAM event or another unaffiliated (non-SySTEAM) forum.

About SySTEAM

Overview

History

Founded in 2021, the INCOSE SySTEAM Initiative is a volunteer-run international community striving to promote greater integration of interdisciplinary systems thinking and systems engineering competencies in education. This year's mini-conference is part of a biennial series of conference-style gatherings organized by SySTEAM, and is intended to serve as an opportunity for members of the SySTEAM community and the public to network with each other and share their ideas, thoughts, and projects.

Embracing STEAM

SySTEAM's community includes a wide diversity of participants from different academic, geographic, and personal backgrounds, and on being a truly interdisciplinary group that includes members of the arts and humanities alongside those from traditional STEM fields. It is SySTEAM's belief that students in every field can benefit from the interdisciplinary systems thinking/systems engineering skills that SySTEAM seeks to promote, and that every student, no matter where in the world they live or what career they want to pursue, has a fundamental right to a quality education that teaches those skills.

In recognition of its commitment to interdisciplinary collaboration, the SySTEAM community officially changed its name from "SySTEM" (the name it was initially launched under) to the "SySTEAM" name it uses today. By including the 'A' in as part of its name, SySTEAM wishes to recognize that the arts and humanities – the 'A' in STEAM – are just as much a part of SySTEAM's vision as STEM fields are, and that the contributions that the arts and humanities offer to STEM fields and vice versa are equally worth celebrating.

Mission & vision

SySTEAM is founded on the belief that systems thinking (ST) and systems engineering (SE) skills, by virtue of being interdisciplinary, are of wide-reaching significance in education and can help students develop competencies that are relevant to careers inside and outside of the SE practitioner community. To that end, SySTEAM strives to promote the integration of ST/SE skills into STEAM educational curricula across the globe, at all levels of education (from primary school to post-graduate education/professional development). SySTEAM is also committed to helping promote more just, equitable, and transparent approaches to education, and thus aims to champion the integration and enhancement of ST/SE into STEAM education in such a manner that helps reduce disparities in educational quality, access, and competency attainment.

The SySTEAM vision is to improve the quality of STEAM education worldwide, for all students, by changing the way in which educators, administrators, and other relevant stakeholders place value on and leverage ST/SE skills, and by establishing a community to advocate for holistic integration of ST and SE principles and skills (inclusive of the skills represented in the INCOSE Competency Framework) into existing STEAM curricula and programs. SySTEAM believes that a solid and robust level of competency in interdisciplinary ST/SE skills is necessary to ensure that today's youth are able to successfully operate in the workplace and as global citizens, and wants to ensure that every student has the opportunity to develop those skills during their educational journey.

Core values

There are several key values which are intrinsic to the SySTEAM mission, and which inform the strategic approaches SySTEAM uses in support of its aforementioned mission and vision.

Accessibility and transparency

SySTEAM believes that all individuals should have the right to a quality education which provides them with the knowledge, skills, and competencies needed for success in the modern globalized workforce, regardless of their personal background, geographical location, professional affiliation(s), or field(s) of interest. SySTEAM therefore is committed to ensuring that its work is accessible, applicable, and implementable by individuals inside and outside the systems engineering community, and that its completed work products are available online at no cost to the public.

Inclusivity and accountability

SySTEAM strives to ensure the representation of the common interests and perspectives of all its stakeholder groups through its participants and community members. SySTEAM notes that imbalances and differences in various educational systems currently result in different stakeholder groups with common educational needs being nonetheless disproportionately over- or under-represented in receiving access to SE/ST competency training and quality STEM education, compared to what may be expected from the composition of the general population; SySTEAM consequently aims to combat this issue through its activity by including participants from a wide variety of backgrounds, actively identifying and addressing areas of variability in STEAM educational pathways, and developing products which have relevance to, and can be implemented by, the widest possible set of stakeholders.

Quality and action-driven performance

SySTEAM aims to establish recommendations and products that are designed to be of long-term use and sustainable to the greatest extent possible. SySTEAM thus prioritizes the identification of obstacles to implementation so that they can be addressed accordingly, and also aims to continuously improve its work products with the help of the international SySTEAM community.

Integrity and ethical conduct

SySTEAM and its members abide by ethical standards for engineering professional conduct. The INCOSE Code of Ethics represents a minimum standard of ethical behavior according to which all SySTEAM members are required to conduct themselves. SySTEAM has also established its own supplementary code of conduct for events under the SySTEAM umbrella.

Aims and activities

Summary

SySTEAM is working towards generating recommendations and resources regarding STEAM education that balance the needs of students, prospective/current employees, employers, etc., in order to maximize educational equity and excellence in SE in a manner that benefits all of SySTEAM's stakeholder groups (students, educators, industry, etc.). Individuals from the general public are more than welcome to join SySTEAM as community members, and are similarly encouraged to provide input to SySTEAM's framework development efforts if they so desire; the SySTEAM inclusivity policy means that any and all interested individuals are welcome to join the SySTEAM community, and that all input is given equal consideration at SySTEAM meetings, etc.

Objectives and goals

SySTEAM's primary strategic objective is to facilitate achievement of its vision of improving education for all students, everywhere, through a combination of community engagement/advocacy efforts and the development of implementable recommendations, guidelines, and resources.

SySTEAM strives to achieve the following goals in support of that objective:

- (1) increasing awareness of, and interest in, SE as a discipline (with an end goal of facilitating increased recruitment and retention of SE talent);
- (2) increasing community attainment of the interdisciplinary knowledge & skillsets needed for success in the SE workforce in particular, and in the global STEAM workforce in general, through the integration of ST/SE competencies into education & training programs; and
- (3) mobilizing existing members of the SE community as advocates for interdisciplinary ST and SE education in their respective regions/communities.

Operational approach

SySTEAM's main deliverable - a framework for integrating SE and systems thinking concepts and competencies into all levels of STEAM education, from primary education to post-graduate

and on-the-job (OTJ) training - primarily addresses goals (1) and (2) above by providing educators and other stakeholders in the sphere of STEAM education with actionable recommendations that they can use to introduce, integrate, and foster SE-relevant skills/knowledge earlier on in the talent development pipeline. SySTEAM is also addressing goal (1) by opening the SySTEAM community, the SySTEAM online community, and SySTEAM documentation to individuals outside immediate INCOSE community (including individuals from the arts and humanities) in addition to those already in INCOSE, in order to help increase awareness of systems thinking & similar skills as interdisciplinary competencies that can be readily integrated into a diversity of existing educational curricula and activities.

As part of its framework development efforts, SySTEAM has also been addressing goal (3) by holding regular open-access community meetings where existing issues of importance in STEAM education/advocacy are highlighted and discussed as a community. Through these discussions, SySTEAM is seeking to identify means of achieving goals (1) and (2) whilst also equipping its community members - many of whom engage in STEAM advocacy outside of SySTEAM - with the knowledge needed to effectively serve as ambassadors for the SySTEAM mission/vision in their workplaces/communities, as well as providing community members with a forum for discussing and sharing ideas related to outreach/advocacy, etc. Rather than directly organizing outreach events (school visits, etc.), SySTEAM's preferred approach is to empower community members and related groups to be the ones to coordinate such outreach efforts (with SySTEAM providing informal guidance where requested). SySTEAM thus aims to be a centralized hub/resource for establishing the foundational infrastructure for community development efforts, which can then be implemented by outreach efforts independently spearheaded by individuals and organizations, local chapters, and community groups who are better positioned to organize and promote grassroots endeavors in their domains/regions of interest.

Links & additional details

More information about SySTEAM is available on the SySTEAM webpage, on the SySTEAM Discord server, and in SySTEAM's articles in the INCOSE member newsletter.

SySTEAM webpage

- **Link:** incose.org/systeam

The SySTEAM webpage is the recommended starting point for newcomers to INCOSE and/or the SySTEAM Initiative. The webpage provides a condensed summary of SySTEAM's mission, vision, and current work, and is regularly updated with scheduling and logistical information about SySTEAM's community meetings and events.

SySTEAM Discord server

- **Link:** bit.ly/3NVLwjV [sign-up/registration], bit.ly/3XxCVqI [registered users]

The SySTEAM Discord server/community hub is an open discussion space for SySTEAM community members to interact and share interesting ideas, resources, and information. It also serves as a repository for SySTEAM's in-progress work and documentation (agendas, meeting minutes, slides, and more), and is generally the first place where SySTEAM files and announcements get posted & shared. The Discord server is also generally the best place to get reminders/updates about SySTEAM meetings and events. A dedicated section of the SySTEAM Discord has been opened for the purpose of hosting online discussion associated with the 2025 SySTEAM mini-conference.

INCOSÉ newsletter & impact statement

- **Link:** incose.org/publications/members-newsletter [newsletters]
- **Link:** incose.org/impact [impact statement]

SySTEAM often shares major progress updates and plans through the quarterly INCOSÉ Member Newsletter and the annual INCOSÉ Impact Statement. Both publications are accessible to non-INCOSÉ members via the INCOSÉ webpage, and are also emailed directly to INCOSÉ members. SySTEAM has previously shared updates in the following INCOSÉ publications:

- **2022 Quarter 1 newsletter:**
 - Introducing the Initiative (pgs. 19-21)
- **2022 Quarter 2 newsletter:**
 - The importance of STEAM (pgs. 19-20)
- **2022 Mid-Year Impact Statement** (pg. 8)
- **2022 Quarter 4 newsletter**
 - SySTEAM end-of-year review and retrospective (pgs. 20-21)
- **2023 Impact Statement** (pg. 5)
- **2023 Quarter 1 newsletter**
 - Plans for 2023 / introducing the mini-conference (pgs. 60-61)
- **2023 Quarter 2 newsletter**
 - SySTEAM mini-conference announcement (pg. 47)
- **2023 Quarter 3 newsletter**
 - SySTEAM mini-conference summary & outcomes (pg. 39-41)
- **2024 Quarter 1 newsletter**
 - SySTEAM strategy updates (pg. 25-27)
- **2024 Quarter 4 newsletter**
 - SySTEAM strategic alignment with the main INCOSÉ organization & year-end retrospective (pg. 25-27)
- **2025 Quarter 4 newsletter:**
 - SySTEAM strategic alignment with the main INCOSÉ org. & year-end retrospective (pg. 25-27)

Additional information

Credits

- *Mini-conference concept/development, organization, & materials* by C. Singam
- *Posters and papers* by contributing authors (listed on the mini-conference schedule)
- *Technical reviews of contributed content* provided by volunteer peer reviewers
- *Social media support* provided by the INCOSE Marketing and Communications team
- *Video conferencing software (Zoom) access* provided by INCOSE
- *Web hosting for the SySTEAM Initiative webpage* provided through INCOSE

Notices and disclaimers

Recording notice

The SySTEAM mini-conference is a recorded online event, which will be simultaneously be broadcast via YouTube livestream. The YouTube recording of the mini-conference will remain available after the conclusion of the mini-conference. Participants who do not wish to be included in the recording must ensure that they have their cameras and/or microphones disabled accordingly during the live mini-conference. Participants are responsible for ensuring that any content they share during the mini-conference is in alignment with both the INCOSE Code of Ethics and the SySTEAM Code of Conduct, and is suitable for distribution in a public forum. Participants should not share private, confidential, proprietary, classified, or restricted-access information unless they are certain it is appropriate and permitted for them to do so.

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Financial disclosures

As part of its commitment to accessibility and transparency, SySTEAM is proud to offer this mini-conference as a free event that is open to any and all members of the public at no cost. The conference organizer, presenters, authors, and peer reviewers associated with this mini-conference are all volunteers who contributed their time and effort to contribute to this conference without financial compensation from INCOSE SySTEAM or the INCOSE organization. As such, apart from its affiliation with INCOSE, SySTEAM has no financial ties to disclose. Contributing authors/presenters whose contributions (papers/posters) were developed within the scope of their employment have indicated their affiliation(s) on their slide decks and papers.

Disclaimer on contributed content

This event features papers, posters, and presentations contributed by various authors, whose work was selected for inclusion in the mini-conference program on the basis of relevance and potential interest to the SySTEAM community. This event also features workshop sessions where participants are provided the opportunity to express their opinions and ideas on various matters of interest to SySTEAM. The views expressed by these authors, presenters, and participants are their own and may or may not align with the views of INCOSE, the SySTEAM Initiative, or the conference organizer. Inclusion of any specific piece of contributed content (whether as part of the mini-conference proceedings (whether as scheduled content or an *ad hoc* contribution) or in subsequent recordings/publications stemming from the mini-conference should not be considered to be an endorsement of the contributor(s), their affiliated institution(s)/organization(s), or the

views espoused by those parties, nor should it be considered an expression of approval or disapproval by INCOSE, SySTEAM, or the conference organizer towards any products, services, or entities referenced by the contributing individual(s).

Special thanks & acknowledgments

This year's SySTEAM mini-conference was made possible thanks to the contributions and assistance of presenters/speakers, peer reviewer volunteers, and attendees from around the globe.

Contributing authors & presenters

SySTEAM thanks the contributing authors whose papers and posters are featured at this mini-conference for sharing their ideas with our mini-conference audience (listed in the mini-conference schedule/technical program).

Volunteer peer reviewers

SySTEAM would also like to thank the volunteer peer reviewers who freely gave their time, effort, and expertise in assisting with reviewing the submitted content SySTEAM received for consideration. Their feedback and comments, sent in via SySTEAM's double-blind review process, were a vital part of helping identify which abstracts to select for the conference's technical program, and in ensuring that accepted content made for a quality, engaging mini-conference program.

SySTEAM community members & mini-conference attendees

Last but not least, SySTEAM wishes to acknowledge its community members and affiliates for helping make this mini-conference a reality. The community's support and enthusiasm for the mini-conference concept, as well as its vivacious response to the SySTEAM Call for Papers and Call for Peer Reviewers, have been a key part of making this mini-conference a success and for validating interest in SySTEAM community events. SySTEAM thanks all the individuals who sent in abstracts and peer reviewer applications for consideration, as well as all of our mini-conference participants, for being willing to share their thoughts and ideas with their fellow community members and for their continued exuberance in supporting the SySTEAM mission, vision, and goals.