



The NorthCoast Interfacier



2008, 2017



2009-2013, 2015-2016, 2018



2014

President's Corner



This is my first President's Corner since being elected to the position in August. I want to take this opportunity to thank Dennis Rohn for stepping in and serving as our President this past year. Through his efforts and leadership, the Chapter is in a much stronger position moving forward. I intend to follow through on his well-articulated focus areas of *outreach*, *engagement*, and *value*.

We plan to continue the relationship we have developed with the students and faculty of Case Western Reserve University (CWRU). Chapter members who have participated in past events with CWRU have very much enjoyed the dialogue and exchange of ideas. We are in the process of seeking a similar relationship with the students at the University of Akron. Soon we will be sending out information to our Chapter members on opportunities to support the UA Robotic Mining Competition (Lunabotics 2020) team this year. We also plan to engage with our Corporate Advisory Board (CAB) members, to solicit feedback and seek ideas on how we may better meet their needs as CAB members of INCOSE.

Look for the upcoming annual C-NO Chapter member survey. I strongly encourage you to take the time to complete the survey and write to us how we could do better to meet your needs and provide greater value for your membership. Every time we have an event, and every person I meet through INCOSE reminds me of why I do this. I'm not necessarily a social creature, but

the engagement and resulting discussions with other systems people across multiple industries never gets old. How can we improve your Chapter?

Elections for the Board of Directors are this month. We are looking to get back on track with our normal election cycles in accordance with our Bylaws. I encourage anyone who has not served previously to give it serious consideration; it is a very rewarding experience. Information on the upcoming elections appears elsewhere in this newsletter.

In closing, it's an honor to serve as President of the C-NO Chapter, and I look forward to working together with our Chapter members to help make this everyone's Chapter.

- Tim Schuler

C-NO President

INCOSE Logo Items

Have you ever wanted a shirt or other item with the INCOSE logo on it? Shirts, jackets, coffee mugs, and other accessories are now available for purchase. Items are available at: https://stores.inksoft.com/incose_merchandise_store/shop/home. You can even order a shirt with "Americas" embroidered below the logo to indicate the Sector we are a part of.

Robotic Mining Competition (RMC): Lunabotics 2020

NASA's RMC: Lunabotics 2020 is a multi-semester university-level event that supports the NASA Moon-to-Mars trajectory by requiring teams to participate in four events:

1. Design, build and compete a robot to simulate an off-world mining mission
2. Present their robot and their design philosophy at the competition
3. Submit a Systems Engineering Paper explaining the methodology used in developing their robot
4. Perform public outreach targeting the under-served, under-represented grade K-12 students in their communities

The C-NO Chapter is looking for members who are interested in working with the University of Akron engineering student team participating in the 2020 NASA RMC. This competition is an engineering exercise where students gain practical experience in the full engineering lifecycle process from concept development to system closeout. Teams will work through the Fall 2019 semester and the Spring 2020 semester with the actual competition to be held at the NASA Kennedy Space Center in May 2020.

Interested chapter members would be available to consult with the UA team, provide advice on their approach to Systems Engineering management and practices, and/or participate in team design reviews.

Please contact: Dennis Rohn, 216-433-2044 if you are interested in participating!

Welcome to New Chapter Members

Since our last newsletter, we have three new Chapter members. Welcome! The Board of Directors hopes the Chapter can aid you in your professional development, and looks forward to getting to know you.

September

- Jim Liu from Philips Healthcare
- Michael Seck of Gentherm
- Pete Jankovsky from Procter & Gamble

-Dennis Rohn

Cleveland-Northern Ohio Chapter Membership Chair

Board of Director Elections

Its election time again for the Cleveland Northern-Ohio Chapter! Per our Chapter Bylaws, elections for the Board of Directors normally occurs in October. Due to our shortened office terms this past year, we will be holding elections in November, with the goal to have the new officers in place following the January 2020 Chapter meeting.

Five positions will be voted on this year: President, Vice-President, Secretary, Treasurer, and an At-Large Director. The term lengths are all one year. Board participation is an opportunity for personal growth and positively influencing the future direction of our Chapter.

Once again this year, Bill Klinger is chairing our Nominations and Election Committee. We are seeking nominations through November 15, and elections will be held approximately November 20 through December 4. If you have an interest in running for one of these elected positions, please contact Bill Klinger at klinger@modex.com.

August 2019 Chapter Meeting

The August 2019 C-NO Chapter meeting was held August 20 at the NASA Glenn Research Center, with remote participation via telecom at the Philips Healthcare/Orange Village location. About 12 attendees were present at NASA, including several non-members, and four tied in from Philips. The meeting was called to order at 5:30 by the newly elected President, Tim Schuler, who gave a brief welcome and overview of the presenter.

The main topic, “*Leadership for Accelerating Development*,” was presented by former NASA Deputy Chief Engineer and Director of the NASA MSFC Engineering Directorate, Chris Singer. The main theme of his presentation was that many in the NASA and DoD aerospace communities feel that most big systems are taking two to five times longer to develop than they did 25 years ago. He provided some insight as to how leadership may be more important than tools and technologies in overcoming this lengthening of the development process. Some highlights from the presentation are noted below:

- Failure in the right context is good. We learn more from failures than successes.
- Tools and analysis, while intended to speed things up, have not actually speeded up development. There are often more questions that come up as a result of those outputs.
- Our challenge is to distinguish failure from tragedy.
- When you don't know what to do, lean forward.
- There is a need by leadership to embrace the quiet thinkers (those that may not speak up right away) so they do not get lost among the voices.
- Need to break through mental models into the facts that are observable.
- Conflict is needed to be creative. Need multiple viewpoints.
- Leaders need a light touch, so you can feel the control bar feedback, without overwhelming it. He gave a particularly informative anecdote about learning to fly hang-gliders, and how anything other than a light touch at the controls will send the glider out of control.
- Everyone on the job is important and they know it.

Chris answered questions from the room and the remote location, and the meeting was adjourned at 6:45 pm.

MIT Class Technical Article

System Thinking & Architecture

Earlier this summer I completed a series of online courses produced by the Massachusetts Institute of Technology (MIT) that covered four significant aspects of systems engineering today. The first course, "Architecture of Complex Systems," included foundational aspects of systems engineering that can often be overlooked in the day-to-day cadence of moving a project from Pre-Phase A (or whatever point you happen to drop in at) to Phase E and beyond.

The notion of form as a system attribute that can be decomposed into *objects* of form and their *relationships* gives rise to the concept of how the whole system architecture generates value for the user. The core idea of a system architecture is the allocation of the physical or informational function to the elements of form. Architecture is therefore not an independent attribute of a system, but the mapping between form and function.

If you look at a system from the most abstract level, the question is "what is the externally delivered function?" That is the primary value function, and it is always delivered across the system boundary. Internal functions and their relationships help to define the functional architecture of the system, but they aren't the primary value.

Function was presented as the combination of a process and an operand. In very abstract terms, a process either creates, destroys, or changes something. A value-related operand is the entity that the system exists to influence. Looking at systems in the above terms helped me to strip away information and concepts that don't relate to primary system function within my projects and focus on the primary value.

One example that stuck with me is the notion of how to specify the challenge that the system is being developed to overcome. The broader and more general the *process* is stated, the larger the

solution space becomes. The example was given of how to “pull a cork” from a bottle. You can use a corkscrew or a cork-puller.

When the problem statement was rephrased into how to “access the liquid” from a bottle, the solutions now included: translation by pushing the cork in, shearing it off, or pulling it out; injecting CO₂ to push the cork out from within; and destroying the cork by burning, melting, or vaporizing. I now have a nifty CO₂ cork remover.

Stay tuned, the next article will cover Architectural Decisions: Connectivity and Sensitivity.

-Marian Cronin

GLRC13

The 13th Annual INCOSE Great Lakes Regional Conference, held at the I-X Center in Cleveland, recently wrapped up a 4-day series of tutorials, technical presentations, panel discussions, joint sessions with the Project Management Institute (PMI), and workshops. The theme of the 2019 GLRC was “Giant Leaps with Systems Engineering,” coinciding with the 50th anniversary of the Apollo 11 moon landing, and included keynote speaker Harrison “Jack” Schmitt. Ten Great Lakes INCOSE Chapters participated or supported the GLRC this year.

The Systems Engineering Professional Development Day (SE-PDD), a full day track of technical presentations and discussions, was once again livestreamed to several remote sites, allowing interaction among presenters and all attendees.

A special thank you to C-NO Chapter member Joel Knapp for serving as the GLRC13 Chair, Program Committee member, and other volunteer duties as they arose! And thank you to the conference volunteers Marian Cronin, Dennis Rohn, and Tim Schuler for their time serving as session moderators and for INCOSE booth support.

INCOSE 2020 International Workshop

The 2020 INCOSE International Workshop is returning to Torrance, California. It is being held January 25-28, 2020 at the Marriott hotel in Torrance, where it has been held in the past. Additional details are available on the INCOSE IW2020 Website: <https://www.incose.org/iw2020/home>.

The International Workshops are a chance for business meetings and for working groups to get together. Some working groups share information, while others work on specific products. There are a few presentations and plenary sessions, but the majority of the activity occurs in smaller groups. Consider attending and getting involved in a working group, as most are always looking for new members. There are various Working Groups that cover different areas, including specific application domains (e.g. space



Workshop Hotel

systems), process enablers, analytic enablers, and transformational enablers. As in the past, there will be a focused on the use of models in systems engineering.

-Dennis Rohn

December Chapter Meeting – Save the Date!

Our December chapter meeting is tentatively planned for Thursday, December 12. We are pleased to welcome James Richards, Senior Systems Engineer at Philips Healthcare, who will be presenting a Webinar on the topic of Safety Risk Management in Medical Devices. Times and location/connection information will be available soon.

Looking for a Few Great Ideas for Upcoming Chapter Meeting Topics

Our chapter membership spans several industries, companies, government agencies, and experiences. If you have an idea for a particular topic or speaker for an upcoming chapter meeting, please feel free to contact the C-NO Board of Directors. Our general email is: NorthOhioINCOSE@gmail.com.

Age of Steam Roundhouse Tour



Five chapter members and three guests toured the Age of Steam Roundhouse on September 20, 2019. Attendees got to see the numerous steam engines and other equipment in the roundhouse, the turntable and yard area, and the maintenance shop. We came away with a better understanding of how steam engines work and some of the requirements that drove various features of the steam engines and how they were built.





Upcoming INCOSE Related Events

The list below provides a sampling of upcoming webinars and events that may be of interest to INCOSE members.

- **January 25-29, 2020 – INCOSE IW 2020 (Torrance, CA)**
 - <https://www.incose.org/iw2020>
- **March 19-21, 2020 – 18th Annual Conference on Systems Engineering Research (CSER 2020) (Redondo Beach, CA)**
 - <https://cser.info/2019/05/09/cser-2020/>
- **April 20-23, 2020 – 14th Annual IEEE International Systems Conference (SYSCON 2020) (Quebec, Canada)**
 - <https://2020.ieeesyscon.org>
- **July 18-23, 2020 – 30th Annual INCOSE International Symposium (IS 2020) (Cape Town, South Africa)**
 - <https://www.incose.org/symp2020>
- **January 29-31, 2021 – INCOSE International Workshop (IW 2021) (Seville, Spain)**

- **July 16-22, 2021 – 31st Annual INCOSE International Symposium (IS 2021) (Honolulu, HI)**

AIAA SciTech 2020

4 January - 5 January 2020, Hyatt Regency, Orlando, Florida

Integrating Program Management, Systems Engineering and Six Sigma

It will present Systems Engineering agile vs non-agile approach, same for Program Management, and how systems engineering supporting Lean Six Sigma.

As systems engineering and program management has evolved since World War II, missions have to be achieved within the constraints of cost, schedule and expected performance. Systems engineering is attempting to describe and define the optimal solution while program management is attempting to determine the necessary work components and develop the plan. Both are keys to the success of a program. Bringing these two disciplines together with a common success measure requires the integration of functions within programs. A comparative analysis of systems engineering to Six Sigma is presented. The pros and cons of agile vs non-agile systems engineering will be discussed.

Details can be referred to

<https://www.aiaa.org/SciTech/program/scitech-course/integrating-program-management-systems-engineering-and-six-sigma>

John C Hsu, Ph.D.,P.E.,ESEP,AIAA Fellow

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-Dennis Rohn

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2019 Chapter Officers:

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Tim Schuler

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Secretary:

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At-Large Director:

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