INTERNATIONAL COUNCIL ON SYSTEMS ENGINEERING

CENTRAL VIRGINIA CHAPTER

www.incose.org/central-virginia
Apr 2023

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Cordially invites you to attend a joint dinner meeting of PMI/CVC and INCOSE/CVC and presentation by:

Anthony I Hennig, PhD

John Hopkins University Applied Physics Lab

Topic:

Measuring System Architecture Properties

At:
Park Lane Tavern

Spotsylvania Towne Centre, 1 Towne Centre Boulevard, Fredericksburg, VA (see map)

Wednesday, 26 Apr 2023

Times:	**Social (Cash Bar)**	**1800**	**(Everyone Welcome)**
	Dinner	**1830**	**Charge: Cost of Meal and drink**
	Presentation	**1930**	

Menu: A variety of dinner choices are available for the given price and one coffee, tea or soft beverage: Fish & Chips, Bourbon Cracked Pepper Steak, Bourbon Chicken, Fennel & pork sausages, Chicken & Chips, Shepherd's Pie, Crab & Balsamic Portabellas, Jagerschnitzel, Chargrilled Salmon, London Broil, Steak House Salad, Ahi Tuna Salad, Cobb Salad, Grilled Chicken & Cranberry Salad, Park Lane Salad, Caesar Salad, Greek Salad, Caprese Salad, as well as an assortment of sandwich meals.

Price: The cost for members and nonmembers is the cost of their dinner and drinks.

Contact: Eileen B. McConkie, PhD, (540) 845-3438, eileenmc@gwmail.gwu.edu or Greg Chambers, PhD (540) 287-1191 gchambers426@msn.com to make your INCOSE reservation and for PMI contact Rod Cutright, (540) 760 5347, Roderick.cutright@gmail.com..

We ask you to help us out by reserving early. You can always cancel later if things change so you cannot make it. Please come out and support this event so that the Chapter can continue to hold meetings in Fredericksburg on occasion. Thank you.

Business Meeting: A short INCOSE business meeting will be held after the presentation to discuss and update on Chapter initiatives and business

Abstract: There is a growing importance to measuring system architecture properties, such as complexity, modularity or other "illities," but after an extensive review of Engineering Design and Systems Engineering (EDSE) literature, there is no leading or agreed-upon methodology to measure these properties. Consequently, there is little agreed upon theory about these phenomena, and I contend that the difficulty in measuring properties and in representing system architectures contribute to the difficulty in developing theory and must be addressed. This dissertation addresses the variability in the measurement process and comprises of three major research thrusts to address those concerns. First, I created a large set of system architecture data from the Astrobee Open Innovation Field Experiment, a challenge series with 17 unique engineering challenges with high degrees *(continued)*

Abstract (continued): of replication for a variety of intentionally architected systems as well as engineer/designer data. Secondly, I explored how system architecture representation affected the measurement of architecture properties using real-world engineering data. Thirdly, I synthesized the literature on complexity into a few commonly held beliefs and I found none of the representative measures used consistently captured those beliefs. Combined, these three research thrusts contribute to the systems engineering literature on measuring and theorizing about system architecture to build a better foundation for future systems engineering research.

Key takeaways for participants for the audience are:
• Approaches that leverage both the quantitative and qualitative can contribute to improvements in systems engineering processes and theorizing
• Open Innovation experiments and game-based simulations provide great opportunities to study systems engineering
• Measures should be critiqued and critically investigated to determine their construct validity, or how closely a measure captures a given phenomenon or concept.

Speaker: Anthony Hennig just graduated with his PhD from the Systems Engineering department at the George Washington University's School of Engineering and Applied Science in Washington D.C. He received his B.S. in Mechanical Engineering and his M.S. in Science, Technology, and Public Policy from the Rochester Institute of Technology in 2016. Anthony's research experiences and educational focus have been on space mission architecting as well as its interaction with space policy. His thesis focused on sustainable policies for the engineering, business, and legal aspects of space mineral resource activities. Outside of academia, Anthony has worked for the Space Mission Analysis Branch at the NASA Langley Research Center, lead systems engineering efforts for GWU CubeSat, developed hardware for CubeSats and educational high altitude balloon flights, mentored students in high school and college in engineering, and established a space systems engineering research group at the Rochester Institute of Technology, RIT SPEX. At APL, he is working to continue his research and improve systems engineering architecting, measurement tools, and processes.

President's Corner: Hello, so glad spring has finally sprung! I hope all are getting excited for this month's System Engineering speaker, Dr. Anthony Hennig. I am planning to have 4 door prizes available this month. Everyone that comes will receive one chance of winning the door prize, if you bring a friend, you will get another chance and who ever talks to the most persons during the 6-6:30 social time will receive an additional chance. Please invite co-workers and then come and network to meet other system engineers and program managers.
Next month we will have Dr. Mickey Skamangas bringing us insight into the path to being a system engineer.

Want to get more involved? The Chapter is looking for people who want to do more for the Chapter. There are Chapter committee positions that need people to fill them. There are Chapter positions suited for those who can make small or large commitments. Contact the Chapter President for information or attend one of the regularly scheduled Dinner or Executive Committee meetings.
To get information on leadership responsibilities go to the Central Virginia Chapter website to view the Bylaws and Constitution, http://www.incose.org/central-virginia/.

The International Council on Systems Engineering (INCOSE) is a not-for-profit membership organization founded in 1990. Our mission is to advance the state of the art and practice of systems engineering in industry, academia, and government by promoting interdisciplinary, scalable approaches to produce technologically appropriate solutions that meet societal needs.

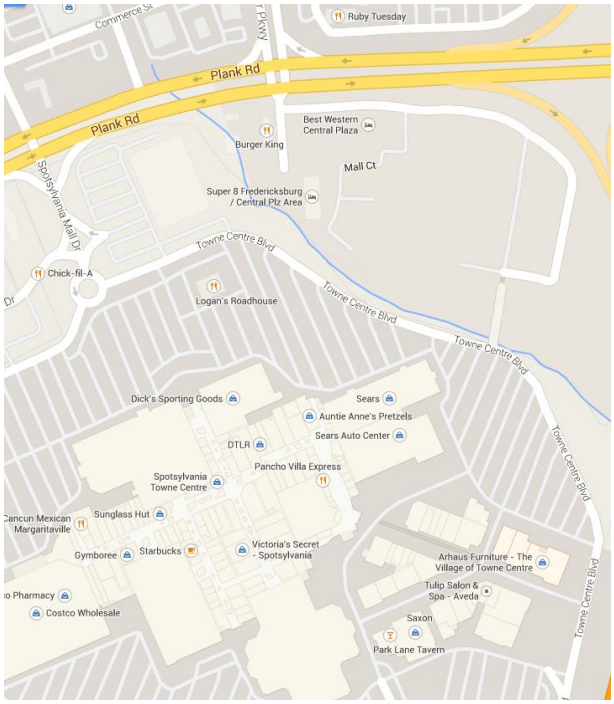
Order Coffee Cups with Chapter Logo: The Chapter will have some coffee cups with the new Chapter logo imprinted on them for mementos for our meeting speakers and for responding members, in the near future. If you would like us to include you on this order, contact Eileen McConkie (see front page). The approximate (at cost) price will be $13 if you pick the cup at a meeting.

Interested In Becoming an INCOSE Member?
If you would like more information about the international Council on Systems Engineering (INCOSE) or you are interested in obtaining information about becoming a member, please contact any of the members of the Executive Committee of the Central Virginia Chapter. Their names and contact information are listed in the "letterhead" located on the first page.

Science Fair Judges and Supporters: On March 4, 2023, the Chapter presented awards at the Virginia Piedmont Regional Science Fair (VPRSF).
The awards consisted of a certificate and check. The first place award was $100, the second place was $75 and third place award was $50, along with Certificates. Dan Vavrick, Director and Science Fair Committee Chairman attended the Regional Fair as judge.
If interested in volunteering or wish for more information on opportunities to participate in Science events, please contact Dan Vavrick or any INCOSE Officer.
The Piedmont Regional Science Fair Web site address is http://www.vprsf.org (Mar 4th) to sign up to be a judge,

The 2023 Virginia State web site is http://www.vssef.org (Apr 14 &15th).

Map to Park Lane Tavern: Get off Interstate 95 at Exit 130 and go west on Route 3 (Plank Road) and turn left into Spotsylvania Towne Centre Mall. At roundabout go left on Towne Centre Blvd and follow it around to the back of the Mall where one turns right to get to the restaurant as shown on map.



From the Desk of the Editor: If you are not on our Chapter's newsletter emailing list, please send me an email and I will make sure to get your name on the list. You will then get future newsletter and meeting announcements. My contact info is on front page.

Again, I want to remind the membership of the efforts that go into organizing a meeting and the efforts of the speaker to prepare his/her presentation. These dinner meetings can only continue with your support. The Officers of the Chapter will continue to arrange excellent programs.

I hope that you decide to support this engineering event, of which there are only a few per year. Also, I hope to meet you and get to know you.

Meeting and Events Schedule:

Future Meetings and Events:

Apr 26. 2023, 1800: Chapter Dinner Mtg; Loc: Park Lane Tavern, Fredericksburg; Spkr.; Anthony I Hennig; Topic: Measuring System Architecture Properties; Coord: Eileen McConkie

May 23. 2023, 1800: Chapter Dinner Mtg; Loc: Park Lane Tavern, Fredericksburg; Spkr.; Mickey Skamangas; Topic: A Pathway to System Engineering; Coord: Eileen McConkie

Past Meetings and Events:

Mar 22, 2023, 1800: Chapter Dinner Mtg; Loc: Park Lane Tavern, Fredericksburg; Spkr.; Steve Brand; Topic: Using Emotional Inteligence to Improve Project Preformance; Coord: Eileen McConkie

Feb 22 2023, 1800: 1800: Chapter Dinner Mtg; Loc: Park Lane Tavern, Fredericksburg; Spkr.; Eileen McConkie; Topic: Membership in the International Council Of Systems Engineering (INCOSE); Coord: Eileen McConkie

Nov 29 2022, 1800: Chapter Dinner Mtg; Loc: Park Lane Tavern, Fredericksburg; Spkr.; Quan Boatman Topic: Risk Management; Coord: Anthony Sirico

Oct 26 2022, 1800: Rescheduled: Chapter Dinner Mtg; Loc: Park Lane Tavern, Fredericksburg; Spkr.; Quan Boatman Topic: Risk Management; Coord: Anthony Sirico

Sept 28, 2022, 1800: Chapter Dinner Mtg; Loc: Park Lane Tavern, Fredericksburg; Spkr.; Dan Vavrick; Topic: Zr and Air Reaction after Impact Modeled with Modified Hydrocode CTH; Coord: Anthony Sirico

May 25 2022, 1800: Chapter Dinner Mtg; Loc: Park Lane Tavern, Fredericksburg; Spkr.; Rob Notman.; Topic: Take your Project Management knowledge and skills and find success in business ownership; Coord: Anthony Sirico

Apr 27 2022, 1800: Chapter Dinner Mtg; Loc: Park Lane Tavern, Fredericksburg; Spkr.; Nicholas Fronzo.; Topic: AEGIS Engineering Processes and the Program Management Organization for Execution Monitoring and Controls; Coord: Anthony Sirico

Feb 23 2022, 1800: Chapter Dinner Mtg; Loc: Park Lane Tavern, Fredericksburg; Spkr.; Michael L. Orr.; Topic: The Challenges and Victories of Transitioning to Digital Engineering; Coord: Anthony Sirico

Nov 30 2021, 1730: Chapter Dinner Mtg; Loc: Park Lane Tavern, Fredericksburg; Spkr.; Byron Knight, PhD.; Topic: The Art of NRO Systems Architecting; Coord: Greg Chambers, PhD

Oct 13 2021, 1730: Chapter Dinner Mtg; Loc: Park Lane Tavern, Fredericksburg; Spkr.; David Maurer, LTC; Topic: The Cuban Missile Crisis 1962; In Extremis Project Management; Coord: Greg Chambers, PhD

Aug 18, 2021, 1800: Chapter Dinner Mtg; Loc: Park Lane Tavern, Fredericksburg; Spkr.; Anthony Sirico; Topic: Machine Learning Techniques for Systems Engineering; Coord: Rod Cutright