

2021: Issue #2

International CEBok® Update

2021 Award Winners

ICEAAWorld

The magazine for the International Cost Estimating & Analysis Association



2021 Online Workshop Review

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The Magazine for the International Cost Estimating & Analysis Association

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The International Cost Estimating and Analysis Association is a 501(c)(6) international non-profit organization dedicated to advancing, encouraging, promoting and enhancing the profession of cost estimating and analysis, through the use of parametrics and other data-driven techniques.

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President's Perspective

Bob Hunt, ICEAA International President


Thank you for allowing me to serve as the new President of ICEAA! I have spoken to many former leaders of ICEAA including **Dan Nussbaum, Bill Haseltine, Brian Glauser, Paul Marston, Andy Prince, and Rick Collins** to gain Lessons Learned from our previous leaders. All agree we are moving in the right direction, but there is more work to be done.

As your new President, I will work with the new Board of Directors to develop specific goals and objective for 2021-2022. As part of our objectives, we will continue President Collins' five initiatives related to CEBOK®, Software CEBOK, supporting the international component of our association, and expanding both Government and OEM involvement. We are already discussing some broad general objectives including a developing a five-year strategic plan, holding a Government Day at the next workshop, planning for an international conference (maybe 2024), and reaching beyond ourselves to support worthy causes, such as supporting science, technology, engineering, and mathematics (STEM) in public schools with a primary objective of attracting more women into our field.

On a global level, I have two overarching goals. The first is I want to support initiatives that help our members see cost analysis as a profession and not just a job. Next, I want to support initiatives that bring direct value to our members. Most of us have a technical, business management, or economic/financial education. However, few of us went to college expecting to become a cost analyst. Many of us fell into this profession and found we were good at cost analysis, we could apply our

analytic skills to the profession, and we provided valuable information to support management decision. In many cases, we are the bridge between the technical, data analytics, and financial management communities. Cost analysis *is* a profession!

As a professional association, ICEAA must provide value to our members, and we are committed to helping members receive recognition within their workplace. We will send recognition letters to the management team of high performing members and volunteers. We will continue to improve CEBOK, Software CEBOK, and the training, testing, and certification process. We need to recognize that it is not a "one size fits all" environment. Government, manufacturing, consulting, and non-U.S. members have different needs. ICEAA is committed to helping all members gain and improve the appropriate skills for career progression. A key advantage of a professional association is helping members connect and network with other members.

The 2021 Online Workshop was a great success, and while the networking events were helpful, they could not replace the value of in-person networking. We look forward to welcoming all of you next year in Pittsburgh. 

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for \$100

Receive one free year of ICEAA MEMBERSHIP

Package available for new and existing members, for use on live and pre-recorded QED Webinars. Details at:

www.iceaaonline.com/qed

Business Office Update

Megan Jones, ICEAA Executive Director



And there you have it, the 2021 Online Workshop is on the books. It was a new and different experience for our members and especially for the ICEAA Business Office staff, **Sharon Burger**, **Chelsea Torres**, and me.

We had no idea what to expect from the Online Workshop, and it's safe to say it exceeded our expectations in (almost) every way. We knew there was no comparing an online event to a real, face-to-face workshop as far as connecting with peers, or interacting with speakers and exhibitors. But the social interaction that did take place during the Online Workshop was way better than we could have imagined. Thanks and kudos to everyone who stepped out of their comfort zone to spark online conversations and make the most out of the communication available to us.

But the rest of it? Expectations blown away. The sessions ran smoothly, our keynote presentations and panel discussions were a big hit, and attendees love the added benefit of being able to watch the sessions they missed or re-watch ones they did see live. Normally this issue is a bit of a rub-in-the-face of the great time people missed out on by not attending the Workshop, but this year, it's different. Those recordings that our attendees have been enjoying for over a month now will be available until **November 15**.

If you missed the Workshop live, there's still plenty of time to sign up and watch over 48 hours of general sessions and breakouts on your schedule, at your own pace. If you like what you see in this issue, sign up for

access at iceaaonline.com/online2021

The other beauty of recorded media is that our Association Award Winners' recognition has been captured for all time and available to watch on our YouTube channel. These videos will let you hear from the nominators and the winners themselves about their award-winning accomplishments. Search "International Cost Estimating" on YouTube to check them and our many other videos out, and if you're not already a subscriber, hit like and smash that bell while you're there!

One online event ends and preparation for the next one begins! We're working closely with the 2021 Training Summit planning team to create the first ever official online CEBoK® training program!

Individuals who have been thinking about and preparing to take the CCEA® or PCEA® exams will be able to watch the instructor-led training sessions that were once only available at the Workshop from the convenience of their workspace. All 16 CEBoK modules will be covered, and our instructors will be live to answer your questions both at the end of each session and during specially designated study group times.

Training Summit attendees will also get a sneak preview of the upcoming Software Cost Estimating Body of Knowledge training sessions, and 2021 Online Workshop attendees qualify for \$100 off their registration for the Training Summit! Details and more to come at iceaaonline.com/summit2021





ICEAA Training Summit

Comprehensive instruction covering all 16 CEBoK® modules
Interactive training with live instructors to answer questions
Updated courses with improved examples and lessons
Sneak preview sessions of the upcoming SCEBoK
(Software Cost Estimating Body of Knowledge)

September 21-23, 2021 www.iceaaonline.com/summit2021



Certification Congratulations

Sharon Burger, ICEAA Certification Manager

As the dust of the pandemic seems to be settling, the one-year anniversary of the launch of ICEAA's online certification exams can be seen on the horizon! In that short time, we've administered 116 PCEA® exams and 91 CCEA® exams! We certainly have come a long way from printing, copying, and mailing exams back and forth with our beloved volunteer exam proctors, and manually grading the exam. Every exam taker can certainly appreciate the faster turnaround of their online exam results as well.

If this piques your interest in certification, the upcoming ICEAA Training Summit in September is an opportunity you don't want to miss! This interactive online training with live instructors will cover all 16 CEBOK® modules with improved examples and lessons. Mark your calendar now for September 21-23, 2021 and register before August 25 to take advantage of the early bird pricing! Those who attended the 2021 Online Workshop in May will also qualify for a discount of \$100 off the Training Summit Registration fee!

Did you miss the Online Workshop held in May? You can still register for access to recordings of the 48 breakout sessions and 4 keynote addresses to view at any time until November 15, 2021. This is also a great opportunity to earn recertification points if you are already certified and struggled to obtain needed points this past year.

Now for those who met the challenge of the certification exams, congratulations are extended to the following individuals for passing either the CCEA® or PCEA® exam between January and May 2021:

CCEA® Achievers:

Thomas Backès, NATO Communications and Information Agency

Alan Boyle, Tecolote Research, Inc.

Katie Dolinger, Technomics, Inc.

Anandi Hira, Tecolote Research, Inc.

Sean House, Tecolote Research, Inc.

Doni Iraheta, Tecolote Research, Inc.

Thomas Lilywhite, Ministry of Defence

Ian Naden, UK Ministry of Defence

Tim Phillips, UK Ministry of Defence

Sara Rosomoff, Booz Allen Hamilton

Robert Strand, Technomics, Inc.

Alexander Torres, Tecolote Research, Inc.

Chris Wallace, UK Ministry of Defence

Eric White, Booz Allen Hamilton

**PCEA® Achievers/
CCEA® Eligible:**

Emily Barnhart, Booz Allen Hamilton
Christopher Bissing, Air Force
Institute of Technology
Kaitlyn Blair, Technomics, Inc.
Eric Hagee, Tecolote Research, Inc.
Zack Henry, UK Ministry of Defence
Zoe Keita, Tecolote Research, Inc.
Alexandra Marsh, Tecolote Research,
Inc.
Jacob Provencher, Tecolote Research,
Inc.
Karyna Todd, Tecolote Research, Inc.
Rachel Ward, Tecolote Research, Inc.

PCEA® Achievers:

Matthew Bosworth, UK Ministry of Defence
Zoe Cridland, UK Ministry of Defence
John Dusing, Herren Associates
Karina Fernando, Air Force Institute of
Technology
Kyle Ferris, Tecolote Research, Inc.
Justin Klingerman, Tecolote Research, Inc.
Caroline Macias, Tecolote Research, Inc.
Joshua Mark, Tecolote Research, Inc.
Kevin Oliff, HunaTek Government Solutions
Robert Orr, Tecolote Research, Inc.
Alexander Pollack, Air Force Institute of
Technology
Iona Radcliffe, UK Ministry of Defence

The following **30** individuals recertified between January and May 2021

Miguel Aceves	Leslie Flugum	Patrick McCarthy
Neil Albert	Amin Hendy	David McConnell
Erin Barkel	Elizabeth Hodson	Michael Metcalf
Mostain Billah	Stacy Houk	Jeffrey Moore
William Carson	Chen Hu	Kyle Mosier
Brett Cayer	Brian Kadish	Richard O'Neill
Gary Collier	Dirk Kalweit	Mark Robinson
Alea DeSantis	J. David LaChance	Ramzi Shuhaibar
Mel Etheridge	Huan Li	Matthew Whitfield
Angela Fields	Katharine Mann	Paul Wood

2021 Online Workshop Review: it was, it wasn't, and it is

by Megan Jones

The 2021 Online Workshop was the best around, polished to the level of professional excellence our

members have come to expect. It wasn't the same as being together with our friends and colleagues, but it was a far more fun and engaging event than most of us assumed it would be. And everything that it was and it wasn't, still is: the live event may be over, but access to the Online Workshop is still available until November 15, whether you attended live or not! If you like what you see here, you can still sign up to watch all the content, ask questions of the speakers, and connect with other registered attendees.

We started the 2021 Online Workshop with a panel discussion from three senior leaders from various United States Government Agencies: [Cheri Cummings](#), DISL, from the US National Security Agency; [Katie Geier Noreiga](#), from the US Department of Homeland Security; and [Ranae P. Woods](#), from the US Air Force Cost Analysis Agency. Their discussion, *A Fool with a Tool is Still a Fool: What's Your Value Proposition?* moderated by ICEAA's 2019-2021 International President, [Rick Collins](#), focused on the less quantifiable value of the estimates



Ranae Woods, Rick Collins, Cheri Cummings, Katie Geier Noreiga

our members painstakingly conjure every day that often can bring more qualitative benefit to an

estimator's leaders or clients.

Monday closed with our first networking event, featuring a fun and engaging trivia contest hosted by one of our gold sponsors, [PRICE Systems](#).

One familiar tradition that was able to be duplicated in the online format was the opening day's announcement of the year's Best Paper award winners. What wasn't possible, of course, was the ceremony where our winners get the happy surprise of learning they've won and receiving their trophy onstage. As with all things lately, we did the best we could in the virtual world we've been thrust into, and showed a short

video at the end of Monday's general session that explained the judging process and named the winners. More on the Best Paper Awards in the coming pages.

Tuesday's agenda began with a keynote presentation from Dr. [Amritpal S. Agar](#), whose podcast, *The Cost of Everything*, has featured a global array of

estimators and analysts, including several ICEAA members, who have discussed

continued



Dr. Amritpal Agar



Rick Collins, George Barbic, Dave Burgess

the cost of everything from hydrogen to carbon. Dr. Agar showed and told the value of communicating your cost message in an interesting and engaging way.

The second day of the Workshop normally features our annual Association Awards presentation. Again, a formal ceremony wasn't possible this year, but what recognition was made possible still is: each of our winners have been featured in a video on our YouTube page, profiling their award-winning accomplishments. You can read more about this year's winners in a few pages, or if you prefer, search YouTube for "International Cost Estimating" and you can hear from the winners and nominators themselves!

The rest of Tuesday was much like a normal ICEAA Workshop: our attendees had their choice of breakout sessions to attend until the afternoon networking event (or evening, depending on where you were) with a



Fred Jankcki, Grant McVicker

rousing game of Would You Rather and hosted by gold sponsor [Cobec Consulting](#).

Wednesday brought us our second panel of senior cost community leaders, this time a mix of US government and original equipment manufacturers: [George Barbic](#), from Lockheed Martin Corporation; [Dave Burgess](#), from Northrop Grumman Corporation; [Fred Janicki](#), from the US Office of the Secretary of Defense Cost Assessment and Program Evaluation; and [Grant McVicker](#), from the US Office of the Assistant Secretary of the Air Force for Financial Management and Comptroller. Rick Collins again moderated the panel through their thoughts on the *Implications of Accelerated Acquisition for Cost Analysis: What Are We Learning?*

Wednesday evening was a networking social double feature, with silver sponsors [Galarath, Inc.](#) bringing attendees together for small group networking, and [MCR](#) showing

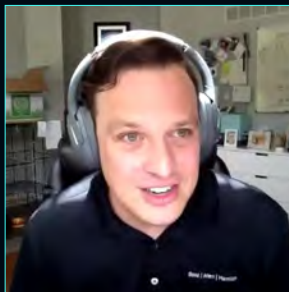
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2021 Best Paper Judges

Leslie Abbey	Asha Dachepalli	Arthur Kaczynski	Danny Polidi
Guenever Aldrich	Nick DeTore	Richard Lee	Stephanie Primeaux
Richard Aldrich	Charlie Dobbs	Arthur Mills	Andy Prince
Timothy Anderson	Bob Fairbairn	Jeremy Mitchell	Jason Richardson
Henry Apgar	Cynthia Foster	Danielle Mrla	Nani Tosoc
Bill Barfield	William Gbelee	Twila Murray	Trevor L. VanAtta
Walter S. Bednarski	Valeria Heard	Denise Nelson	Pamela Wood
	Bob Hunt	David Peeler	

off the talents and testing the smarts of an artificial intelligence.

Thursday brought our final keynote presentation of the week, from a longtime ICEAA member, past Association Award winner, and former Region 4 Director, **Eric Druker** from Booz Allen Hamilton. Eric's presentation, *Cost Estimating in the AI Age*,



Eric Druker

gave attendees real-life examples of how artificial intelligence can work, when it doesn't really work, and how it can be used not just to generate accurate estimates, but to draw additional insights from data.

Throughout the week, our attendees did their best to transform the social and networking engagement that *wasn't* into something that *was* by taking advantage of the interactive elements of Whova, our online event platform. Speakers sparked conversations and questions for their upcoming sessions, meetups for group discussions on specialized topics were proposed, and attendees shared photos of their workspace vistas and furry co-workers. The spirit of camaraderie amongst the membership couldn't be stifled by mere distance, and all the participation on the social side of the

event made it feel a little more like we were all together.

ICEAA would like to thank all of the attendees who took the time to send in their feedback surveys. The overall theme of your comments told us in spite of what the 2021 Online Workshop wasn't, it was great for what it was, and given the situation, that's about the best compliment there is. It's fantastic to see everyone once a year, and something we all look forward to. Just think of how amazing it will be to see each other in Pittsburgh after three years!

2021 Workshop Committee

Workshop Chairs

Jennifer Scheel, CCEA
Christina N. Snyder, CCEA

Abstract Review Chairs

Nick DeTore, CCEA
Karen Mourikas

Best Paper Chairs

Cat Dodsworth
Mike Thompson

Association Awards Chair

Erin Barkel, CCEA

Training Summit Chair

Kellie Wutzke, CCEA

www.iceaaonline.com/online2021

2021 Best Paper Winners

Download all of the 2021 Best Paper Winners' papers and presentations at
<https://www.iceaaonline.com/online2021/#paperwinners>

Some of the changes for 2021 included changes to the Best Paper judging process. The authors had the option to submit a narrative, whitepaper-style paper for award consideration. Those received by February 25 were reviewed by our judges and scored on

five traits: **innovative**, **practical**, **complex**, **compelling**, and **articulate**.

The scores for each paper were tallied and awards were granted to the papers with the three highest cumulative scores.

Best Paper Overall:

How Green Was My Labor: The Cost Impacts of Manufacturing Personnel Changes



Brent M. Johnstone

Estimators are frequently confronted with manpower increases or decreases and asked to calculate shop performance impacts. However, existing learning curve literature offers little guidance how to do so. This paper identifies issues associated with both new hires (so-called "green labor") and workforce reductions and offers an analytical format. Based on a study of a large workforce expansion on a mature aircraft program, a model to analyze future manpower changes is presented as well as several example cases.

Soft Skills & Communication Track Winner:

Does Cost Team Leadership Matter



Christina N. Snyder, CCEA

An anonymous survey of 150+ cost analysts unanimously reported that a cost-team lead's effectiveness ultimately impacts the team's products. However, there has been minimal guidance as to what defines good leadership. Using the ten behaviors identified by Google's Project Oxygen, this paper seeks to understand what skills are necessary for successful cost leadership. The findings lead to a simple conclusion that mirrors that of Project Oxygen: improving our soft skills will improve cost leader efficacy.



Machine Learning & Data Science Track Winner:

Machine Learning and Parametrics for Software Joint Confidence Level Analysis

Sara F. Jardine
Kimberly Roye, CCEA
Christian B. Smart, CCEA



Joint Confidence Level analysis has proven to be very successful for NASA. It is typically conducted using bottom-up resource-loaded schedules. However, the use of high-level parametrics and machine learning has been successfully used by one of the authors. This approach has some advantages over the more detailed method. In this paper, we discuss the approach and provide an example of the application of machine learning and parametric analysis to software programs.

Thanks to all of our 2021 Online Workshop Sponsors & Exhibitors!

Gold Sponsors



Silver Sponsors



Exhibitors



ICEAA 2021 Association Awards

ICEAA thanks everyone who nominated one or more of their colleagues for a 2021 Association Award. Though we were not able to present the awards at our usual presentation ceremony this year, these outstanding members' accomplishments will be celebrated here and on our YouTube channel. As you enjoy the following summaries of their achievements below, think about your fellow members who exemplify the best of the best in the cost world and consider nominating them for a 2022 Association Award!

Junior Analyst of the Year: **Morgan Heimbrock**

In this past year, Morgan Heimbrock has proven herself to be a rising star in the cost field. Morgan has worked on a team to develop innovative solutions for the FAA's Investment Planning and Analysis group (IP&A), taking on increasing responsibilities.



Morgan Heimbrock

Morgan has acquired an impressive set of skills to develop IP&A's new workflow and communications web application and data analytics platform, the Integrated Decision Management (IDM) tool, on which IP&A provides comments to track status of cost, schedule, benefits, and business case aspects of each program in the investment analysis and decision-making cycle. With over 10,000 comments and approximately 400 comments added per month, IDM can bring up a history of these programs for analysts' detailed review and for data analytics purposes, including dashboard summarizing and forecasting presentations through Tableau. Starting from no exposure to software development, Morgan quickly learned the Agile software development process and the hands-on technical skills essential to IDM's development and delivery, including Python, HTML, CSS, JavaScript/TypeScript, SQL and plpgsql.

At a key juncture in the development of IDM, the team lead needed to take nine weeks of emergency medical leave. Morgan stepped up to take over leadership and direction for the software development effort, a role far beyond her 2 years in the industry. She so impressed the team that she has retained the leadership position on the return of the prior team lead, who has taken on a subject matter expert role. Morgan's ability to rapidly transition from junior analyst to leader has assured the project's success.

The work Morgan has performed with her colleagues will provide a means for IP&A to better track changes to the projects which influence costs, schedules and cost model methodologies, and will improve IP&A's ability to analyze relationships across programs and improve the ability to develop and audit cost estimates across the agency.

Morgan is also involved in the Cobec software working group. Morgan works with software estimating experts to develop a software estimation handbook to be used both internally and for the FAA. The handbook is also available publicly and she continues to participate in the review and authoring of a more detailed software estimation guide. Morgan continues studying software estimating and function point counting, attending training provided by IFPUG.

Morgan regularly participates in team huddles with other junior analysts, providing assistance and feedback to her peers and helping problem solve as a team. Morgan also demos her work to help educate and inform her colleagues about database development and administration. Her strong presence contributes to the culture of continuing education and growth that Cobec strives to foster. Each week, she works with another team of developers to do technical deep dives and collaborate on coding and data challenges with her colleagues.

Morgan also co-authors presentations for ICEAA to highlight her team's accomplishments and educate the larger cost community about her work. She attends the conference eager to learn and share knowledge with fellow analysts.

Finally, Morgan is a core member of the Corporate Social Responsibility (CSR)

continued

team. This team organizes and hosts volunteer and fundraising activities across the company. Morgan and the CSR team maintain a strong relationship with the community, partnering with Horton's Kids to provide homework help, Christmas gift wrapping events, and annual fundraising. Her contributions to the CSR committee demonstrate that Morgan is dedicated to both her technical growth in her job and her growth as a leader in the company as well as a member to society. Morgan has an undeniably strong future in the field of cost estimating.

-Nominator **Kellie Wutzke, CCEA**

Technical Achievement of the Year: **Kevin McKeel, CCEA**

Kevin McKeel is a Senior Analyst with Logapps LLC where he has spent the last ten years developing software cost estimates for federal government clients. Over the past five years, Kevin has devoted a large portion of his time and effort to automate function point counting. Today, all research effort for Cadence, Logapps' automated function point counting tool, falls under his leadership.

Kevin got his start in cost estimation at MCR Federal over 20 years ago. From there he moved on to PRICE Systems where he gained an interest in software sizing and software cost estimation through his association with fellow analyst David Seaver. Kevin has an undergraduate degree from James Madison in Finance, an MBA from George Washington University, is a Certified Cost Estimator/Analyst (CCEA®) and a member in good standing of ICEAA.

As head of research for Logapps LLC, Kevin McKeel has pioneered a process for sizing software using natural language processing. In the past year Kevin methodically reviewed other work in the field, many from authors in Europe, Asia, and South America, an improved this work. He further collaborated with multiple thought leaders in the area of software cost estimation in the US. Kevin led the efforts of full-time and part-time analysts and testers who developed and tested multiple methods

for parsing requirements and applying function point counts.

Drawing on his experience with past projects that lacked detailed requirements, Kevin created a model for requirements elaboration that was developed into an algorithm in the summer of 2020. This model leveraged past research on software classification as well as a novel, top-down approach to sizing that he termed, "base and branch". Kevin is currently leading the testing effort to verify that the methodology is repeatable under different conditions and constraints.

Separately, in early 2020, Kevin furthered a methodology that applies function point counting to software maintenance requests (trouble tickets) using natural language processing. As part of the research, he mined hundreds of trouble tickets to extract the typical lexicon associated with common maintenance actions. He further modeled function point weight ranges that effectively differentiate maintenance size from development size.

Kevin's work has significantly reduced the time it takes to size software at several federal agencies. His methodology has also resulted in faster software cost estimation training for many cost analysts. In particular, the automation of function point counting has brought renewed

interest into the area of software sizing, particularly, function point counting as a better option than source lines of code or agile story points. Requirements elaboration has, in a similar way, successfully responded to a growing problem faced by cost analysts working in agile environments: not enough requirements to size projects still in the planning phase. In particular, elaboration was used extensively at the Internal Revenue Service for several of their early projects that had requirements for only the first two sprints.

I have worked and collaborated with Kevin several times over the past decade and find his commitment to improving cost estimation admirable. Kevin's contributions were built on the foundation that many had put in place before him. His advancements have the added benefit of potentially popularizing these ideas among cost estimators and non-cost-estimators alike. Kevin's work this past year and prior represent a solid effort to return analysis to fact-based methodologies that don't hinder or delay a programs' progress. This is perhaps his greatest contribution to cost estimation in the United States and globally.

-Nominator **Ian Brown**

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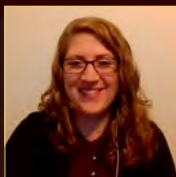
Team Achievement of the Year: Air Force Research Laboratory (AFRL) Cost Team

The accomplishments the Air Force Research Laboratory (AFRL) cost team has been able to complete over this last year, full of immense challenge to the entire DoD, is a testament to the work and dedication of the cost professionals who are pleased to call AFRL home.

At only five years of age, the cost team provides AFRL with unparalleled support through data driven analyses, strategic level decision support, and cost estimates for the science and technology (S&T) community. The cost team directly contributed to implementation of USAF S&T strategy and supported the Chief of Staff of the Air Force's Accelerate Change or Lose program – specifically through delivering transformational capabilities and accelerating innovation by providing accurate and timely cost support to keep S&T relevant now and into the future.

Some of the team's key accomplishments include informing trade space, such as through a \$900M cost benefit analysis evaluating hypersonic technology scalability; advising and informing key S&T capabilities through extensive research and modeling of a \$2B hypersonic prototype/test program; building standardized tools for consistent replicability and reliable forecasting such as an intuitive Excel-based phasing tool and a funds and man-hour expenditure tool; growing the future workforce through seminar presentations and on-the-job training for new costers; supporting the enterprise modeling, simulation and analysis community by developing 15 life cycle cost estimates valued at \$96B and optimizing cost vs effectiveness; providing estimates for AFRL's three Vanguard programs, key to transformational strategic capability; and many more.

In addition to all the above accomplishments and steadfast estimating support, the team furthered collaborative partnerships with cost and technical colleagues across the Department of Defense. Additionally, the internal peer review process initiated last year continues to be an area of growth, providing a low threat, collaborative environment to garner inputs



Ashley Davis



Zachary Newman



Jack Snyder

regarding consistency in estimating techniques, correct model application and identification of errors.

The entire AFRL Cost community has continually sought to enhance the S&T mission through data driven decision making and are proud to collect the ICEAA Team Achievement of the Year Award as recognition to that dedication. Congratulations to all the members of this team:

- Zachary Newman – Chief, Cost and Economics Division
 - Helen Barfield, Cost and Economics Division
 - Ashley Davis, Cost Lead, Armament Directorate
 - Denise DeHass, Cost and Economics Division
 - Mark Holbrook, Cost Lead, Aerospace Systems Directorate
 - Capt. Matt Markman, Cost and Economics Division
 - Kimball Osborne, Cost and Economics Division
 - Samuel Powell, Aerospace Systems Directorate
 - Brittany Smith, Cost and Economics Division
 - Jack Snyder, Cost and Economics Division
 - Jonathan Spencer, Cost and Economics Division
 - Mike Storer, Cost and Economics Division
- Nominator **Zachary Newman**

Educator of the Year: Denise Nelson

Denise Nelson, currently the lead Software Estimator at the Boeing Company, has spent her entire career furthering the education of others in the field of cost estimating, statistics, and mathematics, reaching across multiple domains in both formal and informal settings. She has an impressive track record of developing and presenting curriculum on numerous topics associated with ICEAA. She is considered an expert in affordability analysis, life cycle cost estimating, and especially in software estimating. She regularly and enthusiastically shares her knowledge with anyone who will listen.

Denise received a BS in statistics and an MS in mathematics from Cal Poly, Pomona. Prior to joining Boeing, she spent five years tutoring and teaching various math courses such as statistics, algebra, and calculus as an adjunct

continued

professor at Cal Poly Pomona, honing her teaching skills and adapting her instruction style to reach students, young and old, from various backgrounds and majors. While at Cal Poly, Denise created a summer curriculum to help prepare incoming freshmen for college level math, accelerating their math and problem solving skills, and enabling their success in college. These invaluable experiences are one of the reasons why Denise is such an engaging teacher and mentor to others.

At Boeing, Denise further developed her teaching talents by presenting training courses on various topics related to affordability analysis, such as life cycle cost estimating, parametric estimating, cost risk analysis, and software estimating. Designated as a Technical Lead Engineer in affordability analysis and software estimating, she developed training curriculum for a 5-day course on CAIV, cost as an independent variable, and an 8-module course on software estimating. Currently, Denise is recording tutorials on software estimating topics that are posted on multiple websites and social media within the Boeing Company for self-paced learning. Over the past 17 years, hundreds of students from diverse skill sets, such as finance, systems engineering, and software functions, as well as from multiple defense and commercial programs, and international and domestic organizations, have benefited from Denise's training courses.

As the Boeing Enterprise expert on software estimating, in particular on the SEER-SEM tool, Denise has developed and maintains software interface modules and offers daily support to countless estimators, engineers and senior managers on technical issues, licensing of tools, independent cost assessments and software estimating guidance, training, and mentorship. For the past four years, she has held annual webinars for hundreds of SEER-SEM users which highlight updates to the tools, methods, and processes. In 2020, she established a SEER users' group, expanding the focus to all SEER tools in house (H, SEM, MFG, IT, Catia/3D) and pulling together the larger SEER user community for knowledge sharing.

Denise continues to share the knowledge that she has gained from her multiple roles at Boeing, transitioning to and from finance, engineering, and IT systems in the defense, commercial and research divisions of the

company. By experiencing such diverse organizations, Denise further builds upon her own knowledge to enhance her teaching skills.

With a natural aptitude for learning, Denise is always willing to share her knowledge to early career & experienced engineers, financial analysts & estimators, and technical personnel. She naturally engages fellow professionals and provides valuable learning experiences for them, such as providing hands-on exercises to further reinforce learning. The success of her knowledge transfer is clearly recognized by the quality of estimates from those she has trained, who can then take on more demanding and complex projects.



Denise Nelson

In Denise's current role as Lead Software Estimator, she is introducing and documenting new methods to estimate software and to grow the skills & capability within the company. This documentation provides guidance to estimating organizations in the company resulting in quality deliveries with minimum concerns from the customer and/or successfully identifying, and adjusting, inflated and unsubstantiated estimates during supplier negotiations.

As a member of ICEAA since 2004, Denise has co-authored and presented at several annual workshops on topics such as experimentation cost modeling and random forest estimating methods. She has presented numerous training classes including but not limited to advanced statistics and learning curve theory, to prepare students for the certification exams. In recent years, she has been a valuable and vocal contributor to ICEAA's Software Cost Estimating Body of Knowledge (SCEBoK), creating courses, and reviewing and editing content. For the past few years, Denise has volunteered to review abstracts for the annual workshop, providing the much-needed software perspective to the team.

Recognized as a subject matter expert in life cycle cost for satellites, Denise was invited to contribute to the sustainment section in the Space Mission Engineering: The New SMAD circa 2010. Although limited by Boeing proprietary issues, she still influenced the content on various topics such as the work breakdown structure.

Denise deserves to be recognized for her tireless efforts throughout the years to inform and educate others on subjects of interest to ICEAA: cost modeling, software estimating and affordability analysis. She has received

continued

accolades for simplifying the estimating processes and providing her easy-to-follow step-by-step documentation, intuitive self-paced learning videos, and her training style. She is in high demand at Boeing, especially to train and grow the capabilities within the company. She is also sought after for ICEAA activities such as the SCEBoK development effort, CEBOK® training, committee work like reviewing abstracts, and volunteering and participating in the Southern California Chapter.

-Nominator **Karen Mourikas**

Management Achievement of the Year: **Laura Hawthorn**

Laura Hawthorn has excelled well beyond expectations in her role as the Estimating Branch Chief of the Air Force Life Cycle Management Center (AFLCMC). In this role, Laura is responsible for the Center's cost estimating competency. This means that Laura ensures that over 450 AFLCMC programs are properly developing program office estimates (POE) in support of the Center's budget requests.

As the Center's cost estimating competency lead, Laura builds relationships with financial managers, program managers, cost analysts and chief financial officers. Due to Laura's persistence during 2020, she ushered the Center to 98% POE compliance! This means that 98% of the Center's programs across seven geographic sites had an approved POE or POE waiver. This compliance percentage is the highest in the history of AFLCMC, is the first time the metric has finished in the "green" range, and is directly attributable to Laura's foresight and leadership. And all of this was done while teleworking for 9 months due to the pandemic. A truly remarkable feat!

Laura also takes an active role in reviewing the Center's POEs. In 2020, Laura reviewed estimates totaling over \$2 TRILLION of total life cycle costs! As part of the review team that reviews the Center's POEs, Laura continually brings valuable insights to the conversation to help to ensure that high-quality estimates are representative of the Center's weapon system programs.



Laura Hawthorn

As a subject matter expert in many competency areas, Laura brings a unique expertise to the table and always improves the final estimate product.

In addition to her role as the cost estimating competency focal point, Laura also leads a branch of 13 cost analysts. These analysts range in experience from brand new trainees to some of the most seasoned cost analysts in the Air Force. With each of her analysts, Laura provides incredible mentorship and guidance to ensure that they have what they need to be successful. Laura is never shy to take on challenges that will help the cost analysts in her branch. She demonstrates many leadership traits that include negotiating, coaching and motivating and knows how to find just the right buttons to push to maximize the efficiency and effectiveness of her workforce.

Laura took on the challenge during this very trying pandemic year by setting in motion a virtual work environment for her branch that has been very effective. She ramped up communication and took full advantage of the technology that was available to move the mission forward. During the pandemic, Laura on-boarded 4 new cost analysts. Coming into a new organization is hard enough – doing so during a pandemic adds multiple layers of complexity. Laura did everything that she could possibly do to make the new analysts feel at home, despite not being able to meet with them face-to-face.

Laura Hawthorn is one of the most professional and competent senior leaders in the Air Force cost enterprise. I fully endorse her as the Management Achievement of the Year honoree.

-Nominator **Jim McMahon, PCEA**

Association Service Award: **Christina N. Snyder, CCEA**

Since the merging of organizations that formed ICEAA, Christina Snyder has shown uncommon and sustained volunteer service to the association. Her innovative ideas and commitment to ICEAA have gone beyond making the workshop better each year and have benefitted all of us as members. Christina has been an active part of every workshop since 2012, rising through the

continued

... ranks from track chair, track chair lead, deputy workshop chair, and workshop chair. She began her work with the ICEAA board directly in her role on the outreach committee, in 2019 was elected by the ICEAA membership to serve as the international board secretary, and elected to the 2021-2023 board as executive vice president. She has become a familiar name and face within the association, enthusiastically involved at all levels of ICEAA, volunteering her own time to enhance the profession and engage the membership.

After receiving her CCEA® certification in 2012, Christina co-developed and piloted a successful CEBoK® study and CCEA® preparation program to encourage more analysts at MCR to get certified. However, her advocacy for ICEAA has gone well beyond pushing just for analysts at MCR to be certified: her focus has always been on the furtherance of the ICEAA membership engagement and public interest in cost analysis. Christina has volunteered for every annual workshop since 2013 to teach training sessions and has been progressively more instrumental in each workshop's success, serving as deputy chair, co-chair, or workshop chair since 2016. Her contributions to the workshop have been effective and valuable, as evidenced by positive feedback, steadily increasing attendance, and record-breaking profits.

Her introduction to the ICEAA International board was when she was appointed as Chair of the outreach committee, where she worked with the executive director to reach outside of the normal ICEAA constituency for new members and new CCEAs. As board Secretary, Christina recognized the need for the ICEAA board to institute a conflict of interest policy that would ensure all board members are free from competing priorities and committed to the best for ICEAA. In 2018, she wrote a column for ICEAA World magazine where she asked "what are you doing to attract the best and brightest to the field; how can we make ICEAA an even stronger example of broken stereotypes; and what can we do to help create the mentors that 13 year old girls are missing?"

In June of 2020, Christina drafted verbiage that was approved by the executive committee explicitly stating ICEAA's commitment to diversity, understanding, and inclusion. The sentiment highlighting that "diversity

within in our membership is ICEAA's greatest strength, which fosters a sharing of ideas, innovation, creativity, and empathy." This statement remains on the ICEAA website to affirm our commitment to those ideals into the future. Christina took action on her idea to directly contact colleges with an offer for graduating students to attend the 2021 Online Workshop at a discounted price, inviting graduates to the Online Workshop with the hopes to provide ICEAA member companies a first glimpse at new prospective talent and introducing ICEAA to graduates, college administrators, and professors, who many otherwise never have heard of us. True to her commitment to further diversity in the association, she specifically reached out to many Historically Black Colleges and Universities (HBCUs) across America that have been underutilized in the cost community's recruiting efforts.



Christina Snyder

While conducting her own research to furthering of the profession, Christina consistently looks for areas where ICEAA could increase their depth of training topics. In 2020, she developed and presented guidance for estimators on how to create a compelling narrative to accompany analysis. "Storytelling for Cost Estimators" showed how cost estimators could leverage familiar storytelling techniques to empower our customers with genuine understanding of our estimates by effectively pairing good estimating with good communication. This year she surveyed the cost community to bring attention to the value of strong cost team leadership and leader attributes, presenting that original paper and findings at the 2021 Online Workshop.

Christina has brought so much to every role she has taken on and is genuinely dedicated to the betterment of everything ICEAA. When she volunteers to teach a training course, she commits to providing a thorough understanding of the content; she serves on committees and uses those roles to bring on new members and bring out the best in the team; she conducts and collects her own research to write papers and give presentations towards topics and findings that aren't about promoting her own work, but enabling others to improve themselves. She personifies what it means to be an active, engaged, and committed ICEAA member making Christina Snyder an exemplary ambassador for ICEAA and the entire cost community.

-Nominators **Bob Hunt** and **Jeff Moore, CCEA**

continued

Frank Freiman Lifetime Achievement Award: Christian B. Smart, CCEA

Dr. Christian Smart is the Galorath Inc. Chief Scientist. Previously he worked for the Missile Defense Agency (MDA), where he was the Cost Director with over 100 employees. Before Galorath and MDA, Dr. Smart worked for SAIC, MCR, and Northrop Grumman.



Dr. Christian B. Smart

For over 20 years, Dr. Smart has made—and continues to make at an accelerated pace—outstanding and ground-breaking contributions to the discipline of cost estimating and analysis. Dr. Smart just published a landmark McGraw Hill book, *Solving for Project Risk Management: Understanding the Critical Role of Uncertainty in Project Management*. While Dr. Smart has primarily worked in NASA and DoD circles, his new book tackles risk and uncertainty in all sectors of project management. Dr. Smart's body of work is voluminous, with over 30 technical papers to his credit, most of them on highly complex subjects and offering world-class advancements in the field of cost analysis.

Dr. Smart's professional career has focused on parametric cost analysis and cost risk analysis of space flight and weapon system programs and related areas such as regression analysis, cost and schedule risk analysis, probabilistic risk analysis, and the project management policies that support best in class cost and schedule analysis. He led the development of cost estimating relationships for multiple versions of the NASA-Air Force Cost Model (NAFCOM) and led the development and implementation of a cost risk analysis capability for NAFCOM. Dr. Smart was the lead statistician for the Galorath SEER-Space Cost Model, and led the development of a probabilistic risk analysis for the space shuttle. Dr. Smart developed a joint confidence level analysis for the Ares I launch vehicle and served on the Review of United States Human Space Flight Plans Committee (aka the Augustine Commission). For his NASA work, he was awarded an Exceptional Public Service Medal by NASA in 2010. Leaving NASA work aside for a period, he was recruited by MDA where he led the development of a cost estimating handbook for the agency while simultaneously managing scores of ongoing cost analyses being done by his staff. While at MDA, Dr. Smart also reviewed and contributed to joint government agency handbooks for cost risk analysis and parametrics. He has performed cost analyses for the Defense

Advanced Research Projects Agency (DARPA) and the Pentagon Research and Engineering Organization.

Dr. Smart has written extensively about cost modeling, parametric cost estimating, and cost risk analysis. He has written scores of technical papers and has won more than his fair share of ICEAA (and previously SCEA and ISPA) best paper awards at the annual workshop. He has taught numerous training classes for the association. Dr. Smart has served in a variety of roles on his local ICEAA board as well as terms as Regional Director and Vice President for

Professional Development.

Dr. Smart has been a thought leader and heavy influencer on novel improvements in cost analysis and is a leading world-renowned expert on cost risk analysis where he has expounded new statistical approaches and techniques to improve results including the invention of parametric joint confidence levels using a three-parameter lognormal distribution, insightful improvements to project portfolio management, better methods to specify correlation in cost risk analysis, how to incorporate irregular events into risk management, better ways to take into account the right tail of cost distributions, approaches to calibrating cost and schedule risk analysis to historical cost and schedule growth, new ways to allocate non-recurring and recurring cost, how to estimate component/assembly costs with subsystem level CERs and many other areas of research. Never satisfied to rest on his laurels, Dr. Smart has recently become involved with machine learning/artificial intelligence and is working on cutting edge use of these new techniques in our discipline.

Dr. Smart supports NASA, DOD and commercial aerospace customers on projects ranging from payloads, spacecraft, missiles including hypersonics and human space flight programs that range in cost from tens of millions to billions of dollars. As Chief Scientist, at Galorath, Dr. Smart is a thought leader in the organization and oversees, directs, and inspires other Galorath employees, encouraging their professionalism, technical excellence, standards, and ethics.

-Nominator **Joseph Hamaker, CCEA-P**

Southern California Chapter Report

Karen Mourikas, Southern California (SoCal) Chapter President

Upcoming Events:

The SoCal Chapter is planning future webinars and in-person events and welcomes new participants from any location. Current plan includes a 3rd quarter virtual lunchtime webinar and a 4th quarter in-person all-day workshop (assuming that gatherings are allowed in Southern California then!) Please get in touch with any of the board members if you are interested in presenting or have requests for topics.

Recent Events:

On 8 April 2021 the SoCal Chapter of ICEAA co-hosted (with the Machine Learning for Cost Analysis Working Group) a virtual webinar called *Machine Learning in Spaaaaace* with presentations related to space and/or machine learning. Topics included *Acquisition Complexity (ACS) using Principal Component Analysis (PCA)* (**Mike Finnegan**, The Boeing Company); *Proposing a Space-Based Missile Defense Program: Examining engineering complexities and cost feasibility* (**Matthew Ramirez**, Jet Propulsion Lab); and *Machine Learning for Cost Analysis Plans* (**Bryan Anderson**, **Dan Harper**, **Adam James**, **Karen Mourikas**, **Christian Smart**).

Adding a bit of playfulness to our webinar, as well as to engage our virtual participants, we tried out a new polling capability called PollEV, which allows for real-time interaction with attendees. Questions covered thoughts and perceptions on ICEAA, topics for future webinars, and training interests and included free-form response (i.e. future topics) or pre-formatted options (i.e. machine learning interests).

Lastly, you may be thinking that the word “space” in our webinar title was misspelled. But NO! It was actually part of a trivia question: “Where does the theme of our meeting, *Machine Learning in Spaaaaace*, come from?” Almost before we finished asking the question, we immediately received two correct responses via chat, from **Christian Smart** and **David Barry**!

April 8, 2021 Webinar Live Poll Responses

What Do You Want to Learn Regarding Machine Learning & Advanced Analytics for Cost Analysis?

8%

To get an inkling as to what it is all about

0%

To be able to explain the benefits to my coworkers/management

32%

To understand how it could be applied to my work

12%

To learn how to develop (code) models

12%

To research machine learning algorithms

12%

To use models created by others to analyze problems

20%

To apply data manipulation techniques (cleansing, formatting)

4%

To incorporate natural language processing in my analysis

Chapter and Region Updates ICEAA

And rather than spoil the surprise, we'll keep you in suspense until the next ICEAA World issue. But in the meantime, if you know the answer – and if you did NOT attend our webinar and would like to be entered into a drawing to receive our special SoCal Chapter recognition coin, shoot an email to the ICEAA Business Office and they'll pass you along to us!

Overall, the webinar was well-attended, with people from all regions of the country, and included both ICEAA members and non-members. In addition, all presenters and trivia winners received our SoCal Chapter recognition coin! Lessons learned from our first virtual webinar include scheduling 3 speakers in a 90-minute window is a bit rushed, the polling capability is crucial to engaging participants during a virtual event (and also fun!), and inviting ICEAA members from beyond the SoCal borders as well as from the industry in general is important to help grow our community.

We are in the process of planning our next virtual webinar for mid-August and will apply the lessons from our April webinar, including reaching out to non-members who attended to encourage them to join ICEAA!

ICEAA Southern California Chapter 2021-2022 Board of Directors:

President: **Karen Mourikas**

Vice President: **David Bloom**

Treasurer: **Melissa Winter**

Secretary: **Nicole Leighton**


Board Members: **Hank Apgar, Lisa Colabella, Darin Hoffman, Justin Knowles, Mike Pfeifer, Steve Sterk**

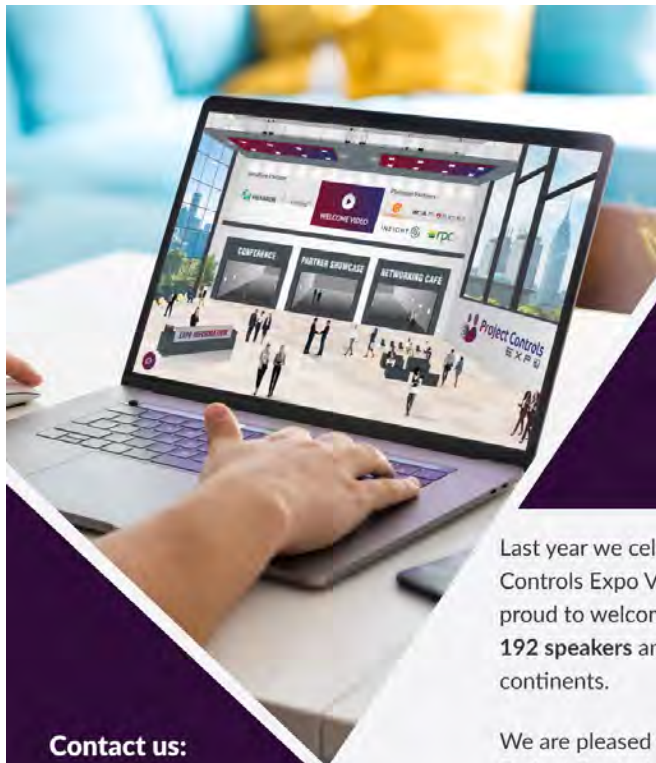
Volunteers: **Tom Bosmans, Kurt Brunner, Matthew Ramirez**

Member Recognition:

Kudos to **Danny Polidi**, who has been elected to serve as the Region 7 Director in the ICEAA Board of Directors for 2021-2023.

Other:

SoCal Chapter Vice President **David Bloom** is spearheading a team to develop a design-to-cost training module, a topic likely to be of interest to the ICEAA community. Stay tuned for an update in the next *ICEAA World*. 



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International ICEAA CEBok® Update

By Dale Shermon, ICEAA UK / Europe Region Director

In issue 2 of 2019 ICEAA World I wrote an article titled *International Constraints of CEBok* proposing the options to make CEBok more international; more global. The 'I' in ICEAA stands for International and the Globe in the 'C' of the ICEAA logo reinforces the commitment from our Board of Directors to promote the art and science of cost estimating & analysis worldwide.

The board agreed with my option 2 proposed in the article to have individual national sections within CEBok, rather than multiple national CEBoks. This option proposed the removal of all country specific references from the body of CEBok making them country independent and gathering this important guidance in specific national sections at the end.

I provided an update on this work in issue 2 of 2020 *ICEAA World*. In this article I wrote about the support that I had received internationally. Firstly, to storyboard the text and then produce full narrative for the international sections. It was great to have the support of many ICEAA members from around the globe. The first stage of this work was completed in 2020 and will be added to the new CEBok version 2.0 Beta, which is available to members for free after logging into your ICEAA profile at www.iceaaonline.com/login.

This has enhanced CEBok with sections for France, Germany, United Kingdom and Australia which provide guidance upon national terminology (acronyms,

terminology), national estimating organizations (government, non-government), national acquisition process, basis of estimate and data, other national considerations, summary, and resources.

I'm grateful to the lead authors who have freely given their knowledge, experience and time to this work. They have also supported the reviews from knowledgeable individuals within the national government organisations. I would encourage other countries review these national sections, consider what their country has in terms of national regulations, processes and guidance for cost estimating and analysis. Then follow in this initiative and replicate the format.

Most recently I have been working with **Cheryl Latimer** to generate suitable ICEAA exam questions. Once that these four national sections are released, it will no longer necessary to test students only with American regulations, but we can examine their knowledge in other country domains. The ICEAA exam has now moved online with an enhanced bank of questions thanks to the efforts of ICEAA Certification Principal **Kevin Cincotta** and Certification Program Manager **Sharon Burger**.

At the present time we have generated a number of multiple choice questions for future national sections of the four countries, these all follow the question format used by ICEAA. These are being reviewed to ensure that they are equal complexity to the other questions in the exam. Once we have agreed and uploaded the new national questions, we will be able to conduct country specific exams for France, Germany, United Kingdom and Australia.

The final step is to promote this capability internationally and seek more certified membership globally. We will be working with **Megan Jones** and the ICEAA office to advertise this capability on the ICEAA website. We will also be looking to our international membership to test the exam, promote the capability globally and expand our international membership.



Dale Shermon is the Head of Planning, Monitoring and Control at QinetiQ. He is a QinetiQ Fellow, lifetime member of ICEAA, SCAF past Chairman and recipient of the ICEAA Frank Freiman award. DShermon@QinetiQ.com





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