Second Quarter Starts with a Bang

Our front page content is a bit unusual this time. Certain events have conspired to occur in a timeframe that make a prominent announcement necessary. Note that some are in early April, and some may need your immediate save-the-date action.

- **02 April 10:00-11:00 MST—Free MIT Systems Design & Management Webinar**— How Self-Organizing "Tribes" are Transforming the Solar Industry. This webinar will offer an interdisciplinary perspective on solar innovation in the United States by examining over 100 case studies. It will use these research findings to describe how self-organizing groups, or "tribes," have become a driving force in transforming the solar innovation industry nationally and globally, and also focus on their potential to transform the value network. Details and Registration at http://sdm.mit.edu/news/news_articles/webinar_040212/webinar-holaschutz-tribes-solar.html. Past webinars are available for download, so if you miss the interactive presentation you can probably download later.

- **04 April—Tutorial Webinar Free: Systems Engineering Fundamentals**, taught by John Clark, INCOSE Training Working Group Lead. Begins April 4th and runs through June, consisting of 9 weekly 60-minute sessions held from **noon to 1:00 p.m., EST.** Access the course and materials with your INCOSE Connect username and password at SE Fundamentals Tutorial or https://connect.incose.org/tut/sefundamentals. If you do not know your personal Connect password, reset your password at http://www.incose.org/membership/requestPWreset.cfm

- **05 April—Tutorial Webinar Free: Systems Engineering Certification,** John Clark, INCOSE Training Working Group Lead. Begins April 5th and runs through September, consisting of 16 weekly sessions, held from noon to 1:30 p.m., EST. Access the course and materials with your INCOSE Connect username and password at https://connect.incose.org/tut/sehandbook. If you do not know your Connect password, reset your password at http://www.incose.org/membership/requestPWreset.cfm

- **10 &11-13 April—Boulder CO. SysML 101 (10th) and SysML 201 (11-13),** Georgia Tech and InterCAX jointly offer this SysML MBSE training program. **SysML 101—Essentials for Understanding SysML Models** (1 day) covers all nine SysML diagram types in a quick and easy-to-learn format. **SysML 201 April 11-13—Hands-On Essentials for Creating SysML Models** (2.5 days) is a hands-on course where participants learn to implement SysML concepts using a representative tool. Contact Russell.Peak@gatech.edu 404-894-7572 or go to www.pslm.gatech.edu/courses.

- **22-24 April—Santa Fe, NM.** SSIAI 2012: IEEE Southwest Symposium on Image Analysis and Interpretation. www.ssiai.org/

Enchantment Chapter Sponsored Tutorials

- **27 April 09:00-14:00—El Paso, TX. Tutorial (Enchantment Chapter): Design Structure Matrix Methods and Applications,** Dr. Tyson R. Browning, Held in the El Paso Natural Gas Conference Hall, University of Texas El Paso Campus. The design structure matrix (DSM) is a powerful and flexible network modeling technique that can be used for designing, developing, and managing a variety of complex systems, from products to processes to organizations. The DSM represents the elements of a system and their interactions, thereby highlighting the system's architecture (or designed structure). Its advantages include compact format, visual nature, intuitive representation, powerful analytical capacity, and flexibility. This tutorial provides an introduction to the DSM and applications to system architecting, organization design, process modeling and scheduling, and project management, with many examples from a range of industries. Students are free, $150 for INCOSE members, $200 for non-members. Contact **salcedo@utep.edu** before April 16 for registration form.

- **10 May—Albuquerque, NM. Tutorial: Complex Systems and Complexity Measurement on Programs**, Dr. Sarah Sheard. Save the date. This tutorial shows how the fields of chaos, fractals, networks, self-organization, complex adaptive systems and the dynamics of complex systems can be applied to a variety of systems engineering situations and roles. A module at day's end discusses complexity measurement for systems acquisition and development programs, based on the author's Ph.D. dissertation work.

- **22 June—Albuquerque, NM. Tutorial: Design Structure Matrix Methods and Applications,** Dr. Tyson R. Browning. Save the date, registration info TBD. Refer to 27 April El Paso tutorial above for tutorial abstract.   ∞

Presidential Words *Chapter President Woody Weed, Sandia National Labs*

2012 is off to a nice start. The monthly Chapter meeting have been lively and well attended. Planning for the remaining meetings this year is almost complete. If you have suggestions or requests for topics/speakers, please send them to me soon. We continue to use the web conferencing application Live Meeting to allow folks not at our meeting place at ATA in Albuquerque to participate; and we continue to evaluate methods for improving the experience, both for attendees at ATA and for remote attendees.

   Look for a couple of tutorials (above) coming up over the next few months. These are a wonderful opportunity to increase your knowledge and skills, as well as gain PDUs for maintaining professional certifications. We are also planning on a tutorial in the fall. I invite you to contact me at jwweed@sandia.gov with your thoughts and ideas about how the Enchantment Chapter can serve you better.   ∞

UR There—Happenings at IW12 INCOSE International Workshop

IV&V WG Rebirth?

Tom Tenorio, White Sands Missile Range

INCOSE was on the verge of folding the largely dormant Verification & Validation Working Group (V&VWG) and taking steps to merge it with the Requirements WG. At IW12 the Technical Operations Committee (Tech Ops), with some members who are also in the NDIA Test and Evaluation Division advocated for the establishment of a re-chartered and re-invigorated V&V working group. They were driven by the desire to have a WG for each of the 11 technical areas in ISO/IEC 15288:2008.

Because many V&V people consider T&E to be a subset of V&V, Tech Ops asked the Autonomous Systems Test and Evaluation WG (ASTEWG) co-chairs (Jack Ring, Don Greenlee, and Thomas Tenorio) for comment. We responded that the ASTEWG remains skeptical that INCOSE is prepared to adequately address the kind of Test & Evaluation necessary in the new era of more collaborative, automated, composable and autonomous systems of systems. This would entail significantly expanding the V&V focus beyond development phase contract compliance to a strong focus on fielded system readiness for specified engagement.

Tech Ops decided to convene a new WG named IVV/T&E even though a charter had not been written. A decision was made to include Integration in the equation and T&E to attract the T&E community. When this charter is available the ASTEWG members will decide whether to discontinue or remain as an independent T&E group focusing on System Readiness.

A bellwether indicator of adequate cov-

Pages in Handbook Devoted to Process Descriptions
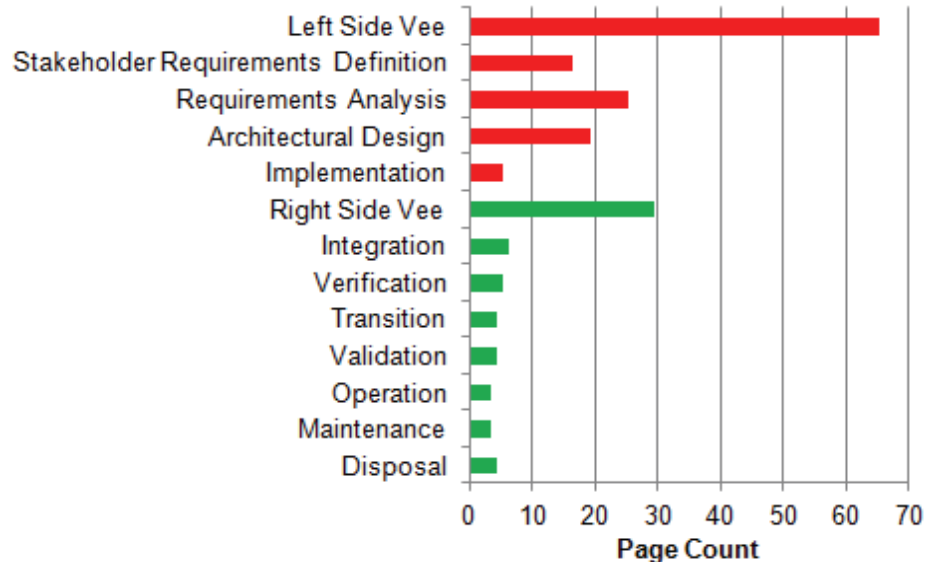
erage of System Vee activity is the INCOSE Systems Engineering Handbook. The handbook has 376 pages of material with 94 pages (25%) that cover the 11 technical processes in the Systems Vee. The process section is Left Vee dominant – 69% vs. 31% if we split the Vee between implementation and integration. Right Vee processes are shown in green and left Vee processes in red. V&V remains only a 5% consideration of the 94 pages devoted to processes.

Left Vee importance continues to grow as system complexity grows, without comparable attention to right Vee processes. Please keep in mind that independent and objective T&E focused on system readiness is absent from the handbook and this graph.

INCOSE is employing a standards framework to determine adequate attention across key areas of Systems Engineering. The indicators of adequacy include Working Group activity, handbook coverage, and volunteers for SEBOK (System Engineering Body of Knowledge) development, according to statements made at IW12.

The confusion over V&V and T&E remains an important issue that system engineers must contend with in the unfolding era of autonomous systems (one of many types of complex systems), where determining whether we are building the right system gets increasingly difficult, and can only be resolved by determining system readiness through independent and objective T&E.

For further details please contact Thomas Tenorio at tenoriot@gmail.com and see the discussions at the ASTEWG site https://groups.google.com/forum/?fromgroups#!forum/astewg .   ∞

Autonomous Systems T&E WG Essay Review at IW12

Rick Dove, Paradigm Shift International

The Autonomous Systems Test & Evaluation WG met in an all-day workshop on Sunday, 22 January to review 10 essay first-drafts, to appear in the 2012 mid-year INSIGHT issue themed: "Systems of the Third Kind (non-deterministic): Distinctions, Principles, and Examples." On site attendees numbered 7 and Live Meeting brought in 5 more.

The purpose of these essays is to call attention to the lack of SE guidance on designing, testing, and deploying non-deterministic systems such as: cars that drive themselves in urban environments; unmanned military aircraft that take-off, land, and fly autonomously; lethal weapons that decide when, where, and who to shoot; unmanned aircraft in the national airspace. Ten essays were reviewed .

The full workshop synopsis showing all participants, with linked access to the essay drafts and author review presentations can be downloaded from www.parshift.com/s/IW12-ASTE-WgWorkshopSynopsis.pdf.

Contact jring7@gmail.com for access to Working Group activities, and see the discussions at the ASTEWG site https://groups.google.com/forum/?fromgroups#!forum/astewg.   ∞

More—Happenings at IW12 INCOSE International Workshop

DoD Program Protection Plan Coming Your Way
Ron Lyells, Honeywell

Ensuring the preservation of system operational integrity over a system's life-cycle and how to address this aspect of system design was one of the more highly attended topic areas in various working groups at the IW. This area is of primary concern for the System Security Working Group which had a high level of participation both from industry and government groups. The U.S. Congress and Department of Defense are particularly interested in this area and are working quickly to enhance already established policies to ensure the security of fielded systems for our armed forces.

Kristen Baldwin, Principle Deputy for Systems Engineering in the office of Under Secretary of Defense, gave a presentation on *Criticality Analysis* covering the intended *Program Protection Plan* to raise awareness within industry and academia as to where the Department of Defense is heading. Key excerpts to keep in mind follow:

1. Congress issued updated program security requirements to the DOD in July 2011.
2. DOD has/is formulating a response to Congress that brings more unified program protection strategies, for hardware, software, and firmware. They are bringing it under the Systems Engineering umbrella.
3. DOD has developed an approach that includes a program protection plan, security reviews during major system review milestones, the output of which feeds the risk process.
4. DOD is socializing this both internally and to industry (e.g. National Defense Industrial Association (NDIA), INCOSE) at present. It might be easier to think about this as one big collaborative learning exercise between the DOD and industry.
5. All new programs as defined by the National Defense Authorization Act (NDAA) will have to determine how to comply.

The Program Protection Plan can be downloaded from www.acq.osd.mil/se/docs/PPP-Outline-and-Guidance-v1-July2011.pdf and Mrs. Baldwin's Criticality Analysis presentation is in the document section of the System Security Engineering INCOSE Connect page at https://connect.incose.org/tb/specialty/systemsecurity.

Information about and access to the Systems Security WG can be had from Rick Dove at dove@parshift.com.

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Competency WG at IW12
Heidi Hahn, Los Alamos National Lab

The Competency Working Group (CWG) met for two half-day sessions on January 23-24 at the IW. Chair Eileen Arnold kicked the session off with an introductory presentation that reviewed the charter and planned work for the group, as well as some of the aspects of competency assessment that the group has been considering. She reported that the establishment of an SE competency framework was a high priority for members of the Corporate Advisory Board (CAB). Eileen also discussed CWG interface priorities, noting that ongoing engagements with the CAB, the G2SEBoK/BKCASE initiative, and the PMI-INCOSE Alliance Team (because of the CWG's interest in SE-PM interface competencies) were the highest priorities.

The remainder of the meeting was devoted to presentations on various competency frameworks, distinctions between individual competencies and organizational competencies, and detailed discussions about specific competencies, including systems thinking and social capabilities, persuasion and influence, and intuitiveness.

Ian Presland gave an overview of the INCOSE UK Systems Engineering Competencies Framework. This framework provides both definition and evaluation criteria for four System Engineering Ability Levels and 21 competencies that can be used both at the individual and organization level. This framework is available to all CAB member companies and INCOSE members and can be accessed via the INCOSE web site product page.

Joe Kasser described some of his recent efforts at benchmarking competency models. He looked at nine SE-related competency models, including the INCOSE Certified Systems Engineering Professional (CSEP) examination and the INCOSE UK SE Competencies Framework. All of the competency models address the SE knowledge domain as well as cognitive characteristics (systems thinking, critical thinking) and individual traits (leadership, communications, ethics, etc.), and some (notably NASA, JPL, and MITRE) also address the problem, solution, and implementation domains.

My presentation explored the notion that SE process competency is the bridge between the individual practitioner and the enterprise. My assertion, based on a review of the literature and our experiences here at LANL in implementing SE within the enterprise, is that there must be congruence between the competence of the individual SE and of the SE enterprise if either is to succeed.

Wiljeana Glover, Donna Rhodes, and Heidi Davitz noted that social characteristics such as trust, confidence, voice, and systems thinking are often considered to be less important than technical capabilities. However, academic and practitioner resources from various fields, have found that systems thinking and social capabilities have a significant impact on performance in work systems. MIT is sponsoring a knowledge exchange event on this topic on April 10. Information can be obtained by emailing sjbenson@mit.edu.

The role of persuasion and influence in enterprise SE was the subject of Duncan Kemp's talk. He stated that the quality of the SE effort is just one factor in project success. Good influencing skills are also critical. Duncan asserted that successful SEs spend more time persuading people of the right approach to take as they do engineering. He gave two key tips to influencing: (1) focus on what matters to key people and (2) build rapport with people by treating them *as they would like to be treated* [emphasis his].

Information about the CWG can be obtained by contacting Eileen Arnold at eparnold5@aol.com or me at Hahn@lanl.gov.

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IW12 MBSE WG Workshop
Sharissa Young, Sandia National Labs

170 participants attended the 2-day workshop on model-based systems engineering (MBSE) at IW12, led by MBSE working group chair Sandy Friedenthal and Ray Jorgensen.

Mr. Friedenthal opened the session by explaining that the increasing complexity of technology has driven the need to evolve from paper document-based engineering into electronic document generation through disconnected system models into the future vision of models that are able to access electronic databases and information contained in many domains.

INCOSE will lead in extending the maturity and capability of MBSE. As part of this effort, 10 webinars were hosted by the MBSE WG in 2011 with more coming in 2012. The MBSE WG is composed of 4 challenge teams and 7 activity teams. Each presented during the workshop. Workshop presentation materials can be accessed at: http://www.omgwiki.org/MBSE/doku.php?id=mbse:incose_mbse_is_2012   ∞

HandBook Security at IW12
Rick Dove, Paradigm Shift International

The Systems Security Engineering WG met in workshop to kick-off a project that will place responsibility for system security on system engineering, and distribute the nature of this responsibility throughout the next version of the SE Handbook. Publication of version 3.3 is scheduled for mid-2013. On-site attendees numbered 20 and Live Meeting brought in 15 more. A steering committee was established consisting of Beth Wilson (Raytheon), Paul Popick (Aerospace Corp representing OSD DASD/SE), and Rick Dove (PSI/SIT).

A wiki will be set up to provide comment on a Version 3.3 outline, to be completed before July. Subsequently, handbook text for security responsibilities will be wiki-crafted in Q3 and Q4 of this year.

Additional work later this year will mount a related IS13 paper submission drive and craft 11 related essays for the July 2013 INSIGHT issue.

Contact Rick at dove@parshift.com to get involved.   ∞

January in El Paso with ITEA and the ASTE WG
Tom Tenorio, White Sands Missile Range

The ITEA 2012 Conference on the Test & Evaluation of Systems of Systems (SoS) was a resounding success. The El Paso conference was held January 24-27. For the first time in years four two-star officers along with captains of industry gathered to discuss the pressing matter of how to determine system readiness in SoS that are being composed incrementally in an ongoing basis. The ASTEWG (Autonomous System Test and Evaluation Working Group) was instrumental in bringing in System Engineering talent from across INCOSE. Dr. John Clymer presented a workshop on Context Sensitive Systems Engineering. Jack Ring led a workshop on the SE of T&E of SoS with Phil Djang (ARL), Filiberto Macias (WSMR), and Thomas Tenorio (ATAMIR/NCI).

John Thomas presented a remarkable keynote speech on how we could move from a stable SoS to a non-deterministic SoS simply by adding a non-deterministic autonomous system to this System of Systems. He challenged the SE and T&E communities to understand the important implications of this increasingly prevalent new System Under Test.

We had an excellent overview of the challenge of SE of T&E of SoS presented by INCOSE Fellow Jack Ring with a diagram that framed the course of dialog for the SE track in the conference.

INCOSE Fellow Regina Griego stepped in to lead an impressive panel with Dr. Catherine Warner, Science Advisor, Office of the Director, Operational Test and Evaluation, the Pentagon; Col. Dave Wellons (US Army), director of the Integrated Test and Evaluation Directorate, Ft Bliss, Tx; Col. Otis Ferguson (US Army, retired), senior military and systems analyst at Research Analysis and Maintenance, Inc.,; and Dr. Bob Kohout, vice president of research at iRobot Corp. and former lead of the Defense Advanced Research Projects Agency's (DARPA) PAL (the Personalized Assistant that Learns) program.

The SE track also included the presentation of several speakers including Rob Heilman, Deputy, Test & Evaluation Science and Technology, Test Resource Management Center (TRMC). A town hall and a world café led to important conclusions on this subject area.   ∞

Preparation, Mentoring and Progress at UTEP

Samantha Dominguez, UTEP INCOSE President and Carlos Sanchez, UTEP INCOSE Vice-President

This spring, the UTEP Systems Engineering Program will continue its tradition of hosting its "Systems Engineering Day" annual conference featuring systems engineering speakers. We excitedly announce that the 4th annual conference is set to occur on April 26, 2012. Last year's event brought speakers from establishments such as Lockheed Martin, Los Alamos National Laboratory, MIT, Raytheon, NASA, Sandia National Laboratories, FAA, INCOSE, and AT&T. We are looking forward to expanding both the breadth and depth of topics in order to advantage the upcoming systems engineering workers of the 21st century.

INCOSE Student Chapter members will be participating for a second time in the Texas Space Grant Consortium Design Challenge. This is a unique academic experience offering undergraduate students an opportunity to propose, design and fabricate a solution for a topic of importance to NASA and its mission. Last year, UTEP students ranked 1st and 2nd among other distinguished universities such as Rice University and Texas A&M University. This year the Design Challenge Showcase will be on April 14 & 15, 2012 in Houston, Texas. This year's team includes Matthew Hernandez, Astrid Barajas, Hoong Yan See, Sergio Luna-Fong, Carlos Sanchez and Amanda Posadas. As design challenge teams progress through a series of Levels and Option Areas, they are involved in taking a real-world research topic of interest from the idea-stage to an actual workable design.

For more information: http://engineering.utep.edu/incose/about.htm and http://rimes.utep.edu.   ∞

Recent Meetings

Heather Kraemer, Sandia National Labs

January 2012—Joseph Schofield, Sandia, Distinguished Member of the Technical Staff, retired, presented *Function Point Analysis is the world's most widely used software measurement technique*. The International Function Point Users Group (IFPUG) is the governing body for the Function Point ISO standard, certification, and testing. As the current President of IFPUG and a long time Certified Function Point Specialist, Joe introduced the concepts related to function point counting, their applicability as a sizing measurement and project tracking mechanism, and their potential use beyond software. Cautions related to "faking estimations" and biases in estimating were also revealed. Presentation materials are posted on the Enchantment Chapter website.

February 2012—Various people who attended IW12 in Jacksonville reported on their observations in sessions they attended. Rick Dove reported on the Autonomous System Test & Evaluation WG and the System Security Engineering WG; Heidi Hahn reported on the Competency WG; Thomas Tenario reported on the new (potentially) Integration, Verification & Validation/Test & Evaluation WG; Ricardo Pineda reported on the the SEBoK project; and Sharissa Young reported on the INCOSE Technical Operations organization structure which has responsibility for all working groups. Presentation materials are posted on the Enchantment Chapter website.

March 2012—Thomas Tenorio summarized the panels and papers, and reported on the objectives, impediments, initiatives and resources that were identified in the Town Hall and World Café sessions held at the January El Paso ITEA conference. His presentation did a wonderful job of outlining the challenges that arise when devising independent and objective test and evaluations for warfighter systems that are increasingly intelligent, unmanned, interconnected, self-organizing and composed of hundreds of heterogeneous components (Systems of Systems). Highlights included:

- DoD Unmanned Systems Roadmap FY2011-2036 (a project Thomas was instrumental in designing last year)
- Direct involvement of warfighters who clarify the spectrum of trustworthy knowledge they must have for deciding suitable, effective, safe, secure and survivable SOS's in the field
- The effectiveness of today's "DoD Guide for SE of SOS"
- The Joint Mission Environment Test Capability (JMERT) designs of the SOS configurations to be tested
- War-fighter engagement scenarios that anticipate the realities of asymmetric and other kinds of warfare

Presentation materials are posted on the Enchantment Chapter website.   ∞

Next Meetings

Heather Kraemer, Sandia National Labs

April 11: Arrowhead Center and Launch
Kathy Hansen, Chief Operations Officer, Arrowhead Center, New Mexico State University

Abstract: Kathy Hansen will give a brief overview of the Arrowhead Center at New Mexico State University (NMSU) and its multidisciplinary program Launch, involving science, engineering, business, and entrepreneurship. Arrowhead Center's Launch program seeks to expedite the transfer of technologies from campuses to commercial venues. By providing researchers and technologists business mentoring, market analyses, product and systems engineering expertise, demonstration-validation services, and access to investment networks, Launch allows work on technological innovation and commercialization to occur on multiple fronts. The Launch proof of concept model greatly reduces the time it takes for an invention or innovation to move from university laboratory/development settings to markets. Kathy Hansen is Chief Operations Officer at the Arrowhead Center, a university organization which promotes economic development and technology commercialization. She received her bachelor's and master's from the University of Texas at El Paso in sociology and political science, followed by Ph.D. coursework in economics at Texas A&M University. Before her work with the Arrowhead Center, Kathy worked for over 20 years at the Physical Science Laboratory (PSL), developing systems for defense and commercial applications. During her tenure at PSL, she was instrumental in establishing the Unmanned Aircraft Systems (UAS) Technical Analysis and Applications Center (TAAC).

May 9: Useful Program Complexity Measurement
Sarah Sheard, Dr. Sarah Sheard, INCOSE Fellow and Principal, Third Millennium Systems LLC

Abstract: Are more complex systems necessarily more difficult to complete successfully? If so, how can one measure such complexity? Sarah Sheard will present a summary of her research which surveyed 75 programs about a variety of complexity measures and outcome measures. Three complexity variables predicted program cost and schedule and system performance; about twenty others were congruent with (in the same direction as) these complexity variables and the outcomes. These variables are good potential indicators of successful program outcomes. She will show these and discuss how we can use complexity assessment to improve the programs we are working on and the systems we are building.

June 13: Lean Enablers for Managing Engineering Programs
Josef Oehmen, Research Scientist, MIT Lean Advancement Initiative.

Abstract: In this presentation, Josef will give an overview of the *Lean Enablers for Managing Engineering Programs*. They are the result of a 1 year collaboration between subject matter experts from MIT, INCOSE and PMI. Josef will discuss the 10 major challenges that engineering programs face, and how they can be overcome with the 40 Lean Enablers and 300 associated best practices the group identified. The findings are documented in the "Guide to Lean Enablers for Managing Engineering Programs", which will be shared with the group.   ∞

Did You Know…?

Major Paradigm Shift in Education Happening Now

Rick Dove, Paradigm Shift International

An article in April's Wired magazine *The Stanford Education Experiment Could Change Higher Learning Forever* provides a comprehensive overview of this paradigm shift in education, and speaks in contrast of the Kahn Academy and MITOpenCoursWare, as well as other Stanford open courses and other on-line education start-ups. See www.wired.com/wiredscience/2012/03/ff_aiclass/all/1 for the mind-opening Wired article.

The Stanford experiment spoken of was started by Sabastian Thrun with partner Peter Norvig, two names well respected and accomplished in artificial intelligence. The expected between 500 and 2,00 student sign-ups and got 160,000 from all around the world. More than 20,000 students took the midterm and turned in weekly assignments. One can take the courses without doing the exams and turning in homework. The course YouTube videos have been viewed 5 million times.

Thrun quit Stanford to pursue this in serious fashion with a new company called KnowLabs. In December the company secured a sizable chunk of money from Charles River Ventures, a VC firm. Thrun's intent is to employ the best-of-the-best as course instructors, and imagines that in 10 years, job applicants will tout their on-line degrees. In 50 years he believes there will be only 10 institutions in the world delivering higher education and he expects his to be one of them.

KnowLabs already has competition from what started as another Stanford experiment: Coursera, an independent venture for serving online courses. They are starting with Stanford but plan to expand to other institutions, and plan to offer 14 classes in 2012. Coursera is active now at Stanford: www.ml-class.org/course/auth/welcome, offering free online courses for Complex Systems (Model Thinking) and Computer Science (Cryptography, Computer Vision, Design and Analysis of Algorithms, Probabilistic Graphical Models, Game Theory, Natural Language Processing, and Software as a Service). Optionally, if you decide to do the deep dive, and take all the quizzes and the exam, you'll receive a certificate of completion from Stanford.

I signed up for last fall's inaugural course on Artificial Intelligence www.ai-class.com offered as the Stanford experiment, long enough in advance to bone up with some probability text books. I also signed up for the Machine Learning course conducted at the same time. Didn't finish either as other obligations encroached, but came away impressed and with a promise to revisit future offerings.

We introduced the Kahn Academy in the Q4 2011 newsletter, with 2400 10-15 minute videos in the library of videos at www.khanacademy.org, covering K-12 math, and college science topics such as biology, chemistry, physics, and higher math. Bill Gates speaks of the "unbelievable" Khan Academy tutorials that "I've been using with my kids."

From TED, check out the video introducing the Khan Academy at www.ted.com/speakers/salman_kahn.html: "Salman Khan is the founder and faculty of the Khan Academy (www.khanacademy.org)-- a not-for-profit organization with the mission of providing a free world-class education to anyone, anywhere. It now consists of self-paced software and, with over 1 million unique students per month, the most-used educational video repository on the Internet (over 30 million lessons delivered to-date). All 2000+ video tutorials, covering everything from basic addition to advanced calculus, physics, chemistry and biology, have been made by Salman.

Very new from TED is *Ted Education* - Video Lessons for [young] Students. From the MemVance blog at http://blog.memvance.com/2012/03/ted-education-video-lessons-for.html: "TED (Technology, Entertainment, Design), the organization based on ideas worth sharing launched a new initiative this past Monday [March 12]. TED-Ed aims to engage students with unforgettable lessons. There are many places in the world where a wonderful teacher or mentor is teaching something mind-blowing, but as it stands now not many people have access to that powerful experience. Ted-Ed aims to bring that engaging experience to everyone who has an internet connection." See the Ted-Ed video collection at http://www.youtube.com/tededucation

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Autonomous Swarm Control

Unbelievable—except here's the proof. At the General Robotics, Automation, Sensing and Perception (GRASP) Lab, at the University of Pennsylvania, Vijay Kumar and his team build flying quadrotors, small, agile robots that swarm, sense each other, and form ad hoc teams -- for construction, surveying disasters and far more.

Vijay Kumar studies the control and coordination of multi-robot formations. Flying quadrotors move together in eerie formation, tightening themselves into perfect battalions, even filling in the gap when one of their own drops out. Watch on TED at www.ted.com/talks/vijay_kumar_robots_that_fly_and_cooperate.html. ∞

New Chapter members

Francis Peter, Management Sciences

The Enchantment Chapter now has 101 active members. We would like to welcome the following new INCOSE members:

Dr. Ethan L. Blansett	Sandia National Laboratories
Stephen D. Denman	PTC
Stacey Glass	Sandia National Laboratories
Patrick Ponsardin	ITT Exelis

The Enchantment Chapter sponsored Student Chapter of the University of Texas at El Paso is doing well with 14 active members—none new during first quarter 2012. ∞

Resources

From IEEE, Free webinar, Managing Safety and Security Compliance in Energy and Utilities Industry, Presenter: Irv Badr, Energy & Utilities, IBM Rational. Abstract: It is vital to automate requirements and process management, in order to meet the safety and security targets. From a security perspective, applications slated for use in both Transmission and Distribution (the smart grid) as well as power generation, such as nuclear power, can take advantage of a secure systems delivery life cycle. Vulnerabilities introduced, especially during the software delivery processes, can arise from a lack of oversight in cyber security evaluation, leading to poor software integration and overall susceptibility.
http://spectrum.ieee.org/webinar/2023342

From CUSEC 2012 January 19-21, Bret Victor's video shows amazing tools he developed that enable people to understand and create. He has designed experimental UI concepts at Apple, interactive data graphics for Al Gore, and musical instruments at Alesis. This video will change the way you think about creating many things, especially programming.
http://2012.cusec.net/first-video-posted-bret-victor

From the Royal Society —the BBC reports that the Royal Society is putting all of its old papers online and has a fascinating sample of articles from the first several years. You can reach all the old journal articles from this page at the Royal Society by selecting a journal and going to past issues.

From MIT World is a free and open site that provides on demand video of significant public events at MIT. MIT World's video index contains more than 800 videos.

(one example: http://mitworld.mit.edu/video/794)
Browse the Videos
∞

Need Circle Award Evidence
Heidi Hahn, Los Alamos National Lab

If you have made a presentation or published a paper related to systems engineering in Q1 2012, please send a citation to me at hahn@lanl.gov. The Enchantment Chapter will include that information in our yearly Circle Award submission. We have won the highest Gold Circle Award 5 years in a row now.

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Connect to Your Community of Practice

Chapter meetings with a focus on systems engineering are held monthly, usually the second Wednesday starting at 4:45pm, except in December. The December meeting is an annual social event, with mingling, dinner, and a speaker chosen for enjoyment by systems engineers and guests alike.

Monthly meetings feature speakers from out-of-town that are visiting the area for other reasons, and local (more or less) subject matter experts on topics of relevance.

On occasion special facility tours are arranged, sometimes as the monthly meeting, and other times on a separate schedule.

Chapter meetings begin at 4:45. After chapter news, announcements and introductions, the presentation and discussion generally lasts until 6:00, all carried live on Live Meeting for those who can't attend. Recordings are not made.

Tutorials with in-depth coverage on topics of interest are arranged approximately twice a year. Delivered by experts in the field, tutorials range from 1/2 day to day+ durations, and generally involve a tuition.

Mix with people who have the same professional interests as you do, but with a diversity of perspective beyond daily workmates. It comes in handy when you need help or answers to questions outside your accumulated experience, need a connection at another organization, or simply want some mind stretching thought.

Meeting and event notices routinely go to all INCOSE members within the Chapter's geographic territory; but Live Meeting connections, special notices, and collaborative opportunities are generally limited to registered Chapter members. Obtain chapter membership on the INCOSE web site by changing your profile or so selecting as you renew membership. ∞

Chapter Board

Woody Weed	President	505-845-9267	jwweed@sandia.gov
Ricardo Pineda	Vice President	915-747-6971	rlpineda@utep.edu
Heidi Hahn	Past President	505-665-4606	hahn@lanl.gov
Heather Kraemer	Secretary	505-844-7128	hrkraem@sandia.gov
Mary Compton	Treasurer	505-845-9268	mlcompt@sandia.gov
Rick Dove	Director	575-586-1536	dove@parshift.com
Regina Griego	Director	505-844-7238	griegor@sandia.gov
Ann Hodges	Director	505-844-6284	alhodge@sandia.gov
Tana Lucy	Director	505-844-9730	tblucy@sandia.gov
Ron Lyells	Director	505-828-5625	ron.lyells@honeywell.com
Francis Peter	Director	505-255-8611	fepeter@comcast.net
Bob Pierson	Director	505-767-1210	pierson@aptec.com
Eric Smith	Director	915-747-5205	esmith2@UTEP.edu
Tom Tenorio	Director	575-405-0008	tenoriot@gmail.com
Sharissa Young	Director	505-845-3272	sgyoung@sandia.gov