November 2016 Newsletter
The IEEE Reliability Society
Joint Section Chapter: Boston - New Hampshire - Providence
Sep 2016 – Nov 2016
http://www.ieee.org/bostonrel

Hello reliable friends! It's been a wonderful autumn here in New England thus far with the colorful fall foliage season enabling our families to enjoy an extra spooky Halloween. In the final week of September, I was delighted to be able to present a reliability statistics tutorial as part of the program at the 18th Accelerated Stress Testing and Reliability (ASTR*) Conference in Pensacola Beach, Florida. It felt great being in Northern Florida again, as I had spent two summers at Florida State University as an undergraduate researcher at the Physics Department there in the late 80's and then again at the National High Magnetic Field Laboratory in the mid 90's. Next year, I will be serving as chair of the ASTR conference to be held in downtown Austin, Texas and look forward to learning from the exceptional cadre of IEEE and ASQ-RD attendees. Dr. William Meeker of "Meeker and Escobar" fame was in attendance at both ASTR2016 and a JMP Reliability Tools seminar held in late October Cambridge. After some 1:1 discussions with him, I explored Bayesian Bootstrap and Metropolis-Hastings techniques to add to my ever-growing reliability analysis toolbox.

Hope to see you at the next Chapter Meeting!
Cheers

ASTR Conference Locations 1998-2017

be wary … ASTR also stands for the American Society for Theatre Research which also holds yearly conferences. Thespians and reliability practioners united in a shared acronym!

Charles H Recchia, MBA, Ph.D.
IEEE Senior Member
IEEE Reliability Society AdCom Member '16-'18
Chair, IEEE Reliability Society Boston Chapter joint with Providence, RI and New Hampshire
Cell (774) 209-0023
charles.recchia@ieee.org

Contents of this issue:

Recent Activities:

June 7, 2016	"An Industrial Physicist's Journey through the World of Semiconductor Reliability" by Dr. Charles Recchia, held at Ohio State University Union, Columbus, OH.
September 14, 2016	"Software Reliability: Tools and Algorithms" Chapter presentation by Dr. Lance Fiondella, UMass Dartmouth
September 28-30, 2016	2016 Accelerated Stress Testing and Reliability (ASTR) Conference, Hilton Pensacola Beach, Pensacola Beach FL 32561 • Keynote Speaker Dr. William Meeker, Professor of Statistics and Distinguished Professor of Liberal Arts and Sciences at Iowa State University. • Featured Speakers Dr. Elisabetta Jerome, Technical Advisor, Armament and Weapons Test and Evaluation, Eglin Air Force, Florida and Dr. Andre Kleyner, Global Reliability Engineering Leader, Delphi Electronics & Safety.
October 19, 2016	"The Design Engineer: Weak Link or Warrior in the ESD Battle?" Chapter presentation by Ginger Hansel, Director of ESD Program Management, Dangelmayer Associates LLC. This was a joint meeting with the Northeast Chapter of the ESD Association NE-ESDA
November 9, 2016	"Obtaining a US Patent" Chapter presentation by Dr. William R. Tonti Ph.D., MBA, Fellow of the IEEE, IEEE Distinguished Lecturer and Sr. Director, IEEE Future Directions

Upcoming Events:

January 23 – 26, 2017

The 63rd Annual Reliability & Maintainability Symposium (RAMS®) will be held in Orlando, Florida in 2017. The theme for Annual Reliability and Maintainability Symposium (RAMS®) in 2017 is "R&M: Managing Emerging Challenges and Risks." RAMS® is a yearly gathering of the product assurance disciplines where training, tutorials, and the latest technical practices, procedures, and results are presented in easy-to-utilize forums and proceedings.
Visit HERE to register.
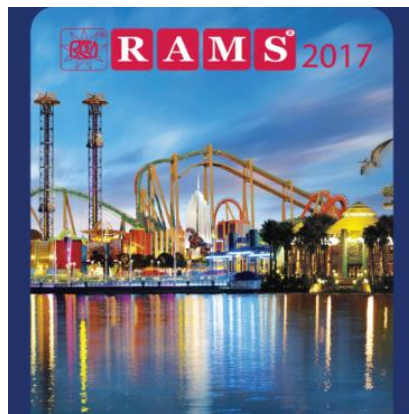

April 2-6, 2017

IEEE International Reliability Physics Symposium (IRPS) will be held in Monterey, CA in 2017. IRPS is the premiere conference for engineers and scientists to present new and original work in the area of microelectronics reliability. Drawing participants from the United States, Europe, Asia, and all other parts of the world, IRPS seeks to understand the reliability of semiconductor devices, integrated circuits, and microelectronic assemblies through an improved understanding of both the physics of failure as well as the application environment.
Visit HERE to register

Recent Chapter Activities:

"Software Reliability: Tools and Algorithms" Dr. Lance N. Fiondella

On September 14 Dr. Fiondella presented on software reliability models and why there are relatively few tools automatically applying these models. Moreover, these tools are over two decades old and are difficult or impossible to configure on modern operating systems without a virtual machine. To overcome this technology gap Dr. Fiondella describes how open source software reliability tool are being developed for the software engineering community. A key challenge posed by such a project is the stability of the underlying model fitting algorithms, which must ensure that the parameter estimates of a model are indeed those that best fit the data. If such model fitting is not achieved users who lack knowledge of the underlying mathematics may inadvertently use inaccurate predictions. This is potentially dangerous if the model underestimates important measures such as the number of faults remaining or overestimates mean time to failure (MTTF). To improve the robustness of the model fitting process, expectation maximization (EM) and expectation conditional maximization (ECM) algorithms are being developed to compute the maximum likelihood estimates of nonhomogeneous Poisson process (NHPP) software reliability growth models (SRGM).
This talk presented an implicit ECM algorithm for the Weibull NHPP SRGM. The implicit approach eliminates computationally intensive integration from the update rules of the ECM, achieving a speedup of between 200 and 400 times that of explicit ECM methods. The enhanced performance and stability of these algorithms will ultimately benefit the software engineering communities that use the open source software reliability tool.
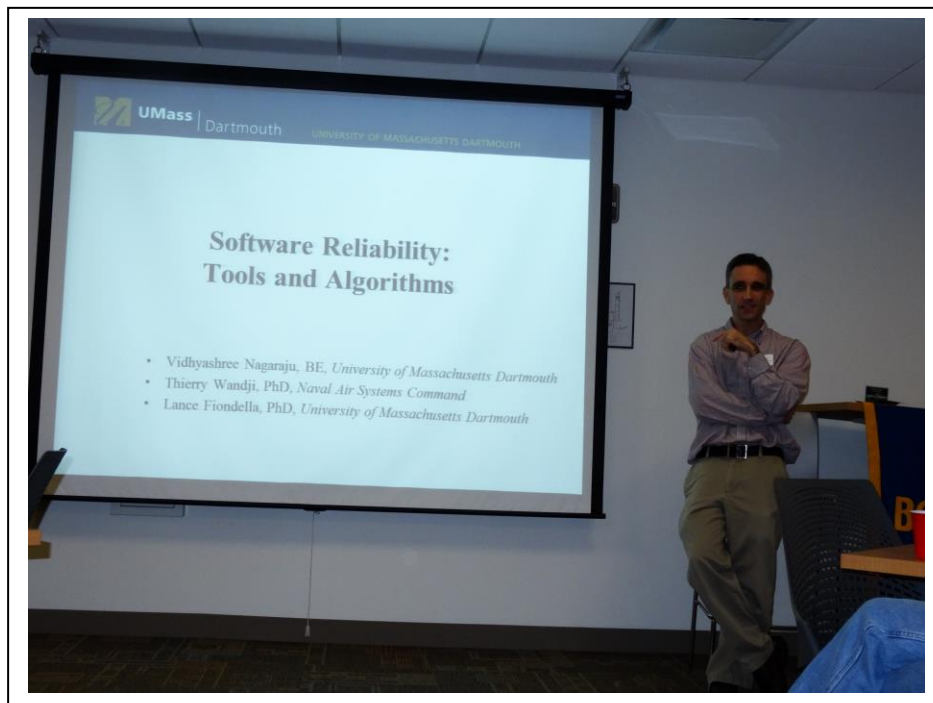
Dr. Lance Fiondella assistant professor in the Department of Electrical & Computer Engineering at the University of Massachusetts Dartmouth received his PhD (2012) in Computer Science & Engineering

from the University of Connecticut. He conducts research in the areas of system and software reliability engineering and has published over 80 peer-reviewed journal articles and conference papers on these topics. He served as vice-chair of IEEE Standard 1633, IEEE Recommended Practice on Software Reliability from 2013-2015 and is an elected member of the Administrative Committee of the IEEE Reliability Society (2015-2017). His research is funded by the National Science Foundation (NSF), Department of Homeland Security (DHS), Army Research Laboratory (ARL), and Naval Air Systems Command (NAVAIR).

"The Design Engineer: Weak link or Warrior in the ESD Battle?" joint meeting with NE-ESDA

On October 19 Ginger Hansel presented on how design engineers strive to incorporate ESD protection into chip designs, but how they are often unclear about the best way to handle the physical devices. The Industry Council on ESD Targets documented a need to lower both the HBM and CDM thresholds with the confidence that factories already had the appropriate ESD control programs in place. However, many engineering labs do not understand or follow industry ESD guidelines and are unaware of the potential jeopardy created by these lower thresholds. Anyone doing device testing, characterization, TLP stress testing, and board level analysis or upgrading their own computer should know basic ESD control techniques. This seminar included practical ESD control tips for engineering labs as well as how to set up and monitor a comprehensive ESD control program. Real world examples were shown that increased ESD risk of Charged Board Events (CBE), the surprising damage due to hand tools and how to use event detectors to identify ESD threats. You've spent a lot of effort doing careful designs – now take good care of your valuable test chips and prototype engineering samples.

Ginger Hansel Director of ESD Program Management, Dangelmayer Associates LLC joined Motorola's Semiconductor Products Sector in 1981 as a Test Process/Equipment Engineer to analyze and improve manufacturing operations. She founded and led the manufacturing ESD control team that trained, audited, qualified materials, and established innovative solutions throughout the semiconductor sector. Under her leadership, the team reduced a 40% failure rate in one test operation to almost zero through the targeted introduction of specific ESD control materials and ESD Awareness training. Ginger brought ESD awareness to her other roles as Engineering Section Leader, Technical Training Manager, QA Engineer, Business Metrics Engineer, Data and Document Control Manager, Program Manager and Technical Product Marketing Manager. Ginger retired from Motorola/Freescale in 2004. She has published numerous magazine articles and technical papers on effective ESD control programs and awareness training; examples include "The Production Operator: Weak Link or Warrior in the ESD Battle" and "Cost Effective Failure Analysis Method for Detecting Failure Site Associated with Extremely Small Leakage". She has taught seminars and workshops around the country and abroad. For over 20 years, Ginger has held leadership positions in the International ESD Association such as President, Board of Directors, and Chairman of the Association Council on Education and has served on the Steering, Technical Program, Standards, and other committees.
Ginger initiated the NARTE ESD Certification in 1992 and is a certified ESD control engineer. She is currently on the board of directors for the Texas ESD Association.

Ms. Hansel received a BS in Natural Sciences (Psychology) and a BS in Electrical Engineering Technology, both from the University of Houston. She received her MBA (Executive Option II program) from the University of Texas.

"Obtaining a US Patent"

On November 9 Dr. William Tonti presented on how the ingredients that are necessary and sufficient for granting a US patent are the intersection of new, useful, and non-obvious elements of enablement. Dr. Tonti describes how this intersection is used by experts skilled in the art to examine the patent specification and its claims. As an inventor you must describe why this application is not anticipated by the prior art. The analysis of prior art when viewed as a unique element or in combination therein cannot read against the claims that arise as a result of the proposed invention. This talk analyzed USPA 5,798,553 "Trench Isolated FET Devices, and the Method for their manufacture". The application describes a fundamental industry problem, and a proposed solution. A description of how this problem statement was introduced into the technical community through IEEE publication was also shown. Fundamental electrical engineering principles were used to both analyze and solve the problem. A semiconductor process solution using standard techniques was shown to satisfy the conditions of new, useful, and non-obvious, and leads to the claims this patent now protects.

Dr. Tonti William R. Tonti Ph.D. / MBA, Fellow of the IEEE, IEEE Distinguished Lecturer and Sr. Director, IEEE Future Directions holds a BSEE from Northeastern University, an MSEE and a Ph.D. from the University of Vermont, and an MBA from St. Michael's College. He retired from IBM in 2009 after 30+ years of service, working as the lead semiconductor technologist for a large part of his career. Dr. Tonti holds in excess of 290 issued patents, and has been recognized as an IBM Master Inventor.

Dr. Tonti was honored by having his 250th patent issue transcribed into the U.S. Congressional Record. He is a Fellow of the IEEE, a past IEEE Reliability Society President, a recipient of the IEEE Reliability Engineer of the Year award, and the IEEE 3rd Millennium Medal. Dr. Tonti joined IEEE in 2009 as the Director of IEEE Future Directions where he works alongside staff and volunteers to incubate new technologies within the IEEE.

.

Link to past presentations   http://ewh.ieee.org/r1/boston/rl/presentations.html

Chapter Participation and Outreach Efforts

I. Chapter Seeks Volunteers

We are interested in having you help out as a volu
contributing as much or as little as you would like. We h
good team of volunteers that help us keep things going
you would like to join us, there is probably ample oppor
to choose how you would like to contribute. Email or t
any of us at the next monthly presentation, or attend
our Advisory Committee meetings.

For updates on upcoming events: http://ewh.ieee.org/r1/boston/rl/events.html.

Readers can contact chapter newsletter editor Ken Rispoli (Kenneth_P_Rispoli@raytheon.com)
with any comment/suggestion or if interested in contributing to our next issue. Thanks.

The IEEE Reliability Society Joint Section Chapter
Boston - New Hampshire - Providence
Newsletters available at the following link:

Boston - New Hampshire - Providence Joint Chapter Newsletter

or copy and paste the URL below on your browser
http://ewh.ieee.org/r1/boston/rl/newsletters.html