

**Reliability Society Website****CONTENTS****President's Message:**[From the Editor](#)**Society News:**[Fellows Award, Dr. Guarin](#)[Lifetime Award, Dr. Pecht](#)[Taiwan Visit](#)[Society Solicitations](#)**Feature Articles:**[Fault Tolerance Using a Concept Map](#)[HALT Introduction \(part 2\)](#)**Chapter Activities:**[From the Chapters](#)**Technical Activities:**[Technical Activities](#)**Announcements:**[See Announcements Section](#)**President's Message****Reliability Society****NEWSLETTER**

Vol. 54, No. 2, June 2008

Dear Reliability Society Members,

Where I reside in the US summer is finally upon us and I hope wherever you are that you are enjoying this season as much as I am. There are a few points I would like to share with you in this newsletter, and as always I appreciate your feedback and willingness to become involved within the Reliability Society. Please send your comments to wtoni@ieee.org.

Elections:

First and foremost I would like to share with you the results of the executive officer elections. These transitions will take place on 1/1/2009. The president elect is Alan Street. The Vice President elects are: Louis Gullo-Publications, Dennis Hoffman-Membership, Alfred Stevens-Meetings, and Samuel Keene- Technical Activities. Please join me in congratulating the 2009 leadership team!

I would also like to thank those who are presently serving in the 2008 Vice President positions: Alan Street-Publications, Jeff Clark-Membership, Marsha Abramo-Meetings, and Sam Keene-Technical Activities. A special thanks goes out to Christian Hansen our secretary, Dick Doyle our treasurer, Lon Chase our newsletter editor, Way Kuo the editor in chief of IEEE Transactions on Reliability, Jason Rupe the managing editor of IEEE Transactions on Reliability, Tony Oates the editor in chief on Transactions on Device and Materials Reliability and Bret Michael our newly appointed co-editor of the magazine IEEE Security and Privacy, Building Dependability Reliability and Trust. Last but not forgotten there are two individuals that deserve a warm thank-you for all that they do for the Reliability Society both behind the scenes and upfront and personal. They are Jeff Voas- Junior Past President and Dennis Hoffman- Senior Past President.

The ADCOM nominations and candidates for the 2009-2011 class have been submitted. The candidates are: Lisa Edge, Angelo Visconti, Scott Abrams, Scott Tamashiro, Philip Laplante, Alan Street, and Alfred Stevens. Jeff Voas (j.voas@ieee.org) will administer the election. The ADCOM is the administrative committee that oversees all of the Reliability Society operations. An election is conducted each year as one third of the ADCOM completes a term. All the positions mentioned above have been previously or presently elected as ADCOM members. As an ADCOM member, one is required to serve under one of the officers and become directly involved in the Society's ongoing projects. In the future if you are interested in running for a three year ADCOM term, please send your contact information, a bio of 350 words or less, and a vision statement to Jeff Voas.

IEEE Security and Privacy: Building Dependability Reliability and Trust:

The Reliability Society and the Computer Society have signed an agreement to jointly publish "IEEE Security and Privacy" which is now titled "IEEE Security and Privacy, Building Dependability Reliability and Trust". As part of the membership value, the Reliability Society is pleased to offer a free digital subscription in 2008, and a full hardcopy free subscription in 2009. By now everyone should have received an e-mail pointer to navigate you to the web page to view or download the May-June 2008 issue. If this is not the case, and you have either deleted the e-mail or simply not received it, please send a note to our publications VP, Alan Street (a.street@qualcomm.com). Alan will add you to the distribution. The Reliability Society 2009 content launch is presently in the planning stage. If you or another colleague have material that already, or will in the future, fit into the scope I would ask you to contact the RS editor, Bret Michael (b.michael@nps.edu) and work with his staff. Broadly speaking the scope of the magazine for reliability content is dependability, reliability and trust. This spans all hardware, software, skinware, transnational public as well as private policies and laws that contribute if you will to a trust equation.

Reliability Society Awards:

The Reliability Society has two IEEE awards that it may designate to its members. One is entitled the "Engineer of the Year", and is intended to be awarded to a young engineer who has made a significant contribution in Reliability Engineering. The second is entitled "Lifetime Achievement Award" and is intended to recognize an individual for sustained achievements in the discipline of Reliability Engineering throughout his or her career. For more information regarding the award requirements, please navigate to the RS home page or contact Jeff Voas directly (j.voas@ieee.org).

• **Engineer of the Year Award**

The IEEE Reliability Society solicits nominations for its Reliability Society Engineer of the Year Award each year. This award is aimed to recognize key contributions to the Reliability profession within the previous few years. Nominees are considered according to the following criteria:

- Reliability Contributions in one or more of these focused areas;
- Reliability Technical Contributions
- Reliability Management Contributions
- Reliability Publications
- Contributions to Reliability Education

An administrative superior of the nominee (e.g. department head, supervisor, or chapter chair) should make and submit the nomination. The nomination package should consist of a one-half page biography of the nominee plus up to four pages of concise descriptions of the accomplishments. For technical contributions, please concisely describe why the contribution is unique. For managerial and educational contributions, please concisely explain the obtained benefits. Please limit identified publications to only those in which the nominee was the sole or principal author.

Engineer of the Year Awardee (Awarded in Jan 2007):

Alfred DuPlessis, who developed analysis techniques to perform "Software FMEAs" and to perform "automated bent pin analyses" along with methods to more easily integrate reliability and associated analyses into the design and development process.

• **Reliability Society Lifetime Achievement Award**

The IEEE Reliability Society solicits nominations for its Reliability Society Lifetime Achievement Award annually. The IEEE Lifetime Achievement Award was created to recognize sustained outstanding contributions to the field of Reliability Engineering. Typically the contributions will span the career of the individual, usually in excess of 25 years. The contributions meritting this award must clearly be within the area of Reliability Engineering. Nominations must be submitted by a peer or supervisor of the nominee. The nomination package should consist of a one-half page biography of the nominee plus up to four pages of concise descriptions of the nominee's lifetime accomplishments / achievements.

Reliability Society Lifetime Achievement Awardees

- Awarded January 2008: Michael Pecht, who is an internationally recognized technical leader and educator in the field of the reliability. He is the founder and Director of the CALCE Electronic Products and Systems Center. His research contributions are recognized by his peers in both industry and academia.
- Awarded January 2007: Zigmund Blubband, who has more than thirty years of experience and contributions to the Reliability Engineering community, as a Reliability Engineer, consultant, author, instructor, manager, and computer-aided-engineering applications developer / provider.

Graduates of the Last Decade (GOLD):

The Reliability Society continues to support GOLD through university scholarships, best student paper awards, and Society student outreach university seminars. At the June TAB (Technical Activities Board) meeting, the Reliability Society led the way by introducing to TAB a methodology to identify its GOLD members sorted by their Society and TIP codes. The GOLD chairman Gim (Soon) Wan (gwan@vicr.com) has asked all Society presidents to compile a similar list. Chairman Soon will be sending all GOLD IEEE Society members an invitation to become involved in "Their IEEE" based upon the data that is mined. There was unanimous (all) Society buy-in for this project. Please be on the lookout for Soon's email. We, the Reliability Society, have a substantial percentage of GOLD members, and I would very much like to see a positive response to the activity Soon will be detailing. The goal is to transform what I stated above, ie, "Their IEEE" into "OUR IEEE", which is the stable state that we should be in. This is the end game that as Chairman Soon would say results in a WWW (not a web address but rather a Win Win Win for GOLD, the Societies, and the IEEE as a whole). OK, so you read this and I may have confused you as to the definition. One is a GOLD member simply by clock cycles. If you have graduated with your first degree within the last ten years and you are presently an IEEE member (In this case most likely also a Reliability Society member), then by default you are also an IEEE GOLD member. Once the 10 year clock has run its course you are no longer a GOLD member. I hope that you take advantage of this upcoming opportunity and become involved in the call Chairman Soon is shortly going to unveil. If you would like a head start, please send Soon or me an email and we will plug you into an appropriate GOLD activity that matches your interest.

Student Outreach Symposia:

The Reliability Society held a joint student outreach symposium at the University of Padua, Italy on May 29-30. The event was entitled: "System and Device Reliability in Nanoelectronics Reliability. This was sponsored with the department of Information Engineering at the University of Padua. The symposium was very successful as the University embraced us with open arms, and over 150 of their best and brightest students attended.

The invited symposium speakers and their presentation titles were::

- Samuel Keene, Developing world class products with "Design for Six Sigma" Tools
- Richard L. Doyle, Microelectromechanical Systems Reliability
- Gaudenzio Meneghesso, RF-MEMS reliability
- Alfred Stevens, Safety and Reliability on the NASA Space Shuttle
- Alessandro Paccagnella, Ionizing Radiation Effects on Electron Devices and Integrated Circuits (their presentation)
- Marsha Abramo, Focused Ion Beam Technology and Applications to Microelectronics
- Massimo Vanzi, Laser Diodes Fundamentals and Reliability
- Dimitri Linten, Electro Static Discharge (ESD) effects on CMOS ICs
- Karl Engl, GaN Light Emitting Diodes: the solid state lighting revolution
- Matteo Meneghini, Reliability of GaN Optoelectronic Devices
- Enrico Zanoni, Reliability of GaN Microwave Transistors



Alfred Stevens is discussing NASA space shuttle reliability and safety at the University of Padua RS student outreach event, as the University students listen.

[Additional information and pictures of the symposium.](#)

As we look forward in 2008 and into 2009 the Reliability Society planned student symposia are:

- September 26, 2008 at the University of Ottawa and Carleton University, Ottawa Ontario
- September 2009 in London England in conjunction with the RS UK chapter.

Please visit the RS website as these dates come closer for specific times locations and speakers. We hope to see you at one or more of these events. If you would like the Reliability Society to plan an event at your university, chapter, region or company please contact Marsha Abramo. (sheski@gmavt.net).

[RS Student Scholarships:](#)

The IEEE RS Scholarship Program provides up to five scholarships each year to qualified and deserving students. Selection is based on:

- Involvement in IEEE activities.
- Academic achievement with a preference to those who have demonstrated excellence in reliability.
- Extracurricular activities related to academic / professional interests
- Letter of evaluation by at least one of the instructors in a course with reliability content.

The first three 2008 scholarships, have been awarded. Congratulations are in order to Vijay Venu Vadlamudi, a student at the Indian Institute of Technology in Bombay, Shravan Gaonkar, a student at the University of Illinois Urbana-Champaign, and Nafarajan Raghavan, a student at the National University of Singapore.

Applications are being accepted for the Winter Term with a submission deadline of November 1st. Applications forms can be downloaded on the RS web site, and after completing this it should be sent to:

Alfred M. Stevens
200 Cordoba Court
Merritt Island, FL 32953
USA

[Conferences:](#)

The Reliability Society continually sponsors or incubates technical conferences to benefit all engineers. Shown below are the conferences which we are presently involved in.

- International Conference on Radio Frequency Identification (RFID): Las Vegas NV, April 1 6-17, 2008
- The International Reliability Physics Symposium (IRPS): Phoenix, AZ, April 27- May 1, 2008
- The Annual International Electrostatic Discharge Workshop: Pinsolla, Port d'Albet, France, May 12-15, 2008

- The International Symposium On Rapid System Prototyping (RSP): Monterey, CA, June 2-5, 2008
- The International Symposium on the Physical & Failure Analysis of Integrated Circuits (IPFA): Singapore, July 7-11, 2008
- Secure System Integration and Reliability Improvement (SSIRI): Yokohama, Japan, July 14-17, 2008
- The European Symposium on Reliability of Electron Devices, Failure Physics and Analysis (ESREF): Maastricht, The Netherlands, September 29-October 2, 2008
- The International Prognostics and Health Management (PHM): Conference Denver, CO, October 6-9, 2008.
- The International Integrated Reliability Workshop (IIRW): Stanford Sierra Camp, Fallen Leaf lake, CA, October 12-16, 2008
- The International Symposium on Software Reliability Engineering (ISSRE): Seattle/Redmond, WA, November 10-14, 2008
- The High Assurance Systems Engineering Conference (HASE): Nanjing, P.R.China, December 3-5, 2008.
- The Reliability and Maintainability Symposium (RAMS): Fort Worth, TX, January 26-29, 2009.
- The International Society for Quality Electronic Design (ISQED): San Jose, CA, March 23-25, 2009

There are four conferences on the calendar that are quickly approaching.

ESREF is the European counterpart of the IRPS. They both focus on the physics of failure as well as the physics in analyzing a failure in microelectronic VLSI. This year ESREF is being held in Maastricht, the Netherlands.

PHM is a new conference this year and has its launch in Denver, CO. PHM focuses on the detection, prediction, and management of complex systems health and status.

IIRW is a microelectronics device and materials reliability workshop. This workshop has a traditional conference makeup as well as intense discussion groups and special interest groups that take a life of their own and they live well beyond the workshop dates. Many IIRW workshop papers go on to win best papers in an enhanced post IIRW publication, or they are published in the IEEE T-DMR transactions. This conference is held each year at the exclusive Stanford-Sierra camp located on the south side of Lake Tahoe, CA.

ISSRE focuses specifically on software reliability and all the issues related to the system of system failures that can and do manifest themselves. This conference will take place in Seattle this year.

Project Status:

Below is a snapshot of the ongoing projects that are in progress. I encourage you to contact the project leaders to become directly involved.

ASQ / IEEE Project:

This project is defined as a partnership between ASQ and the IEEE to update, refine, and administer the CRE exam (Certified Reliability Engineer Exam). A joint workshop is planned in early August 2008 where ASQ and the IEEE RS will develop a member survey so that the CRE exam can be subsequently updated jointly by ASQ and IEEE subject matter experts. RS members have responded to this call and twenty SMEs are ready to lend a hand! This is a significant step in making certification available to our members as well as ASQ members and in doing so opening up both IEEE and ASQ resources. The ASQ and IEEE RS have developed a Memorandum of Understanding (MOU) for joint development and ownership of the current ASQ CRE. We are currently waiting on approval of the MOU from both ASQ and IEEE. If you have interest in this project please contact Alfred Stevens, the IEEE Reliability Society principal (astevens@ieee.org)

Standards:

Lou Gullo (Louis_J_Gullo@raytheon.com) is presently working on 5 standards with Joe Childs and Scott Tamashiro. If any RS members at large would like to be involved with the publication of these and other standards yet to be devolved, please touch base with this team. Here are the standards the Reliability Society is presently involved in:

1633 "Recommended Practice on Software Reliability"

Status: RevCom has approved this in March 2008. Prior to approval the working group managed 5 recirculation ballots and 14 draft revisions. The standard is currently being published (July 2008).

1624 "Standard for Organizational Reliability Capability"

Status: Completed recirculation ballot #3 with 3 comments from the ballot group. The plan is to submit into RevCom, October 2008.

1332 "Standard Reliability Program"

Status: The PAR was approved in March 2008. The working group is presently working on a draft revision.

1413 "Standard for Reliability Predictions"

Status: PAR was extended and the working group is actively revising the present draft.

1413.1 "Guide for Reliability Predictions"

Status: PAR was approved in March 2008. The working group will begin working on this as soon as the 1413 Standard is completed.

In addition, the RS through Lou is planning to attend the annual plenary session of the IEEE Computer Society's Standards Committee (S2ESC) in July 2008 in Melbourne, FL. Lou is a member of the S2ESC committee to jointly develop standards with the IEEE CS.

Technical Activities:

The 2007 Reliability Society Annual Technology Report, a compilation of the technical updates in reliability is completed, and a brief will be printed in the September 2008 IEEE Transactions on Reliability. Sam Keene (s.keene@ieee.org) would like your feedback and comments on the published brief.

Please consider submitting your work for the upcoming the 2008 Reliability Society Annual Technology Report to any of the following folks: (In general if you have a doubt where to submit, send your inputs to Sam Keene and he will work directly with you)

- Sam Keene, VP Technical Activities - s.keene@ieee.org
- Dennis Hoffman, Deputy Technical Activities - dennis.r.hoffman@lmco.com
- Japan: Shuichi Fukuda - shufukuda@gmail.com
- Taiwan: Shiuhyung Shieh - ssp@cs.nctu.edu.tw:
- Europe: Enrico Zio - enrico.zio@polimi.it
- Singapore: Sam Keene (acting)
- System of Systems: Jim McLinn - james.mclinn@teradyne.com
- Software Development: Robert Stoddard - rws@sei.cmu.edu
- System/Subsystem Development: Lou Gullo - Louis_J_Gullo@raytheon.com
- System Foundation (Devices) - Aaron Dermarderosian - Aaron_Dermarderosian_Jr@raytheon.com

RS Yahoo Forum:

This forum / discussion group remains quite active and is a current successful product. Please log onto the Society website and get involved!

RS Video Tutorials:

The Reliability Society has digitized its VHS technical tutorial library. If you are interested in learning more about these inexpensive learning tools, please contact Dr. Christian Hansen. (c.k.hansen@ieee.org). Presently the tutorial of highest interest is "Accelerated Testing"

EXPERT Now Modules:

The RS continues to add new contact into this IEEE educational venue. The newest module "Concepts and Models for Repairable Systems Reliability" is completed. If you have technical modules that you are interested in publishing to the IEEE community please contact Alan Street (astreet@qualcomm.com)

Statistics and open circles:

Someone once asked me (and probably you) "What are the odds of...?". Well, although this is difficult to answer without data, things do happen that are statistically improbable. About 2 months ago I was flying with my daughter to Phoenix, AZ, through Chicago. It was one of those days where you should have just stayed home. Chicago was under siege by a terrific thunderstorm, and well... we were stuck. After navigating to customer service and waiting to speak with someone for 2 hours, my daughter and I decided this was a useless exercise. The line had moved about 10 feet in the two hours, and we were backed up approximately $\frac{1}{2}$ the distance of the terminal which is in the thousands of feet. Statistically we would miss any flight that might take off, so we were then determined to start walking the terminal observing the departure flight status which was updated about every 15 minutes with cancellations and also rebookings. As we began navigating out of the customer service line, the Chicago maintenance staff moved and subsequently encircled us with the potted plants one sees scattered about within the terminal. It turns out these 3 meter in diameter plants are strategically located under roof leaks during storms. There were about five leaks where we happened to be standing. Needless to say we had to make some unusual circular maneuvers in order to exit the area where we were standing. As we did this my daughter exclaimed: Look... in the distance. There is Dr. Way Kuo! And sure enough there he was also wandering about the "leak detectors". Dr. Kuo (our IEEE T-Rel editor) was on his way to Hong Kong to become the president of the City University of Hong Kong. Now, how my daughter knew Dr. Kuo is the subject of yet another story, but suffice it to say that she is an electrical engineer who practices in the field of Reliability Engineering. So, statistically speaking a number of simultaneous 6s events took place (I count five) and below is a picture of three worn out travelers documenting the grand event. And Way, this entire true story is a lead in from the Reliability Society as we wish you CONGRATULATIONS in your new position!!!



Regards,

Bill Tonti

IEEE Reliability Society President

<mailto:wtonti@US.IBM.COM>

From the Editor

Welcome to the IEEE Reliability Society e-Newsletter. An issue will be published quarterly and published to the Reliability Society website.

We welcome your articles, comments or questions. All RS Newsletter inputs should be sent electronically to l.chase@ieee.org.

March	Inputs due February
June	Inputs due May
September	Inputs due August
December	Inputs due November

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Society News

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[Lifetime Award, Dr. Pecht](#)

Taiwan Visit

When RS held the first System Integration and Reliability Improvement Conference in Hanoi Vietnam in December 2006, we met Professor Shiuhyung Shieh of National Chiao Tung University (NCTU), Hsinchu, Taiwan (<http://dns.csie.nctu.edu.tw/ssp/>). He is the Director of the Taiwan Information Security Center, Director of the NCTU-Cisco Internet Security Lab, President of the Chinese Crypto and Internet Security Association, Past Chair of the Department of Computer Science and Information Technology department. Professor Shieh received his Doctorate in EE at the U of Maryland, one of the lead universities in reliability.

We discussed the possibility of Professor Shieh starting a new Taipei reliability chapter, which he accomplished in November 2007. Dr Way Kuo, President of Hong Kong City University and managing Editor the Reliability Transactions and Sam Keene, RS Technical Activity Chair, visited the new Taiwan chapter this month. Professor Shieh set up meetings for us with the President of staff at NCTU, the Taipei IEEE section, The Taipei chapter, the two research arms of the Taiwan government, Industrial Research and Technology Institute (ITRI), and the Institute of Information Technology (IIT). strong commitment of the area to IEEE membership and professional activities, Most executives we met had at least one degree from a US university.

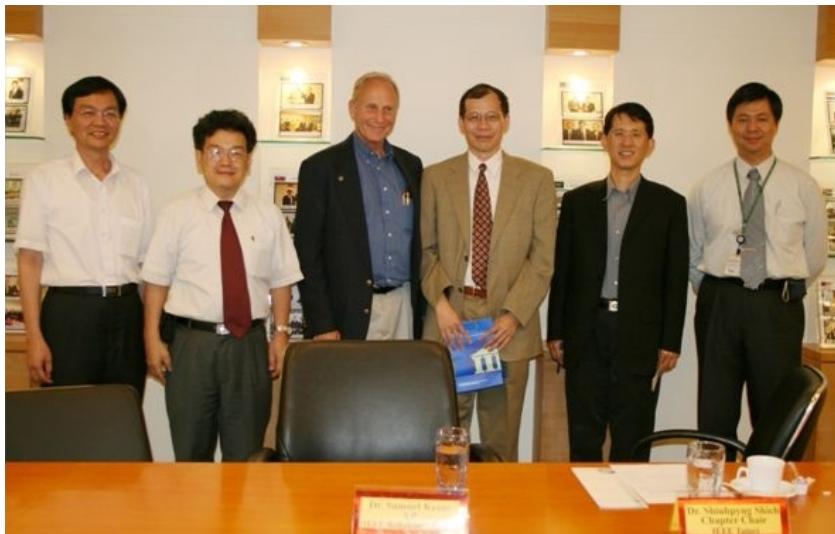
The Taipei chapter has strong focus in software security and microelectronics. We are proud to welcome their chapter into the reliability society and especially appreciate Prof Shieh's efforts to organize this new chapter.



Professor Shiuhyung Shieh and Sam Keene



Pictured left to right, Prof Lin, Prof Sheu, NCTU VP, Sam Keene, Way Kuo, and Professor Shiuhyung Shieh. About half of the faculty we met were IEEE Fellows and most had at least one degree from a US University. Prof Lin, for example, was a Fellow of the IEEE, ACM and the AAAS.



Professor Shieh and Sam Keene meeting with the leadership of the Institute of Information Technology

The IEEE Taipei Section was established in 1974. There are over 3200 active members with 32 achieving the office of IEEE Fellow. You can feel the professionalism and dedication to IEEE professional standards. Taiwan's IC design industry commands a 22.1% share of the global market, second only to the US (http://investintaiwan.nat.gov.tw/en/opp/inds/semi_micro.html). The Taipei chapter would like to hold the Secure Systems Integration and Reliability Conference in TAipei in 2010, They would solicit ITRI and IIT to sponsor this event.

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Society Solicitations

Reliability Society Scholarships

Up to five \$2000 scholarships will be awarded each year to students who have demonstrated achievement in their studies and have taken at least one course with reliability content. We encourage all interested students to apply.

"We are extremely pleased with this outreach effort, and hope that these scholarships encourage students to take an interest in Reliability Engineering and to understand that reliability is an overarching factor in whatever they may be studying and what they will do in their career. If you are a student, and have taken a course with reliability content which sparked an interest in reliability, I encourage you to apply for this scholarship" said Bill Tonti, the President of the IEEE Reliability Society.

Detailed requirements and applications for the scholarship are available [here](#) and on the Reliability Society website

(<http://www.ieee.org/portal/site/relsoc/>) and through school financial aid offices.

Call for Fellow Nominations

Nominations are being accepted for the IEEE Fellows class of 2010. The rank of IEEE Fellow is the institute's highest member grade, bestowed on an IEEE Senior Member who has had an extraordinary record of accomplishments in any of the IEEE fields of interest. The deadline for nominations is 1 March 2009.

Senior Members can be nominated in one of four categories: application engineer/practitioner, research engineer/scientist, educator, or technical leader.

More information on how to become a fellow is available in this [link](#) and the Fellows Web pages which has information regarding the history of the IEEE Fellows program, the nomination process, access to the Fellows Nomination Kit, lists of Fellows who are eligible to be references and more about the Fellow program. Please visit the Fellows website at <http://www.ieee.org/fellows>.

Reliability Society Engineer of the Year Award for 2008

"The IEEE Reliability Society is soliciting nominations for its reliability Society engineer of the Year Award for 2008. This award aims to recognize key contributions to the reliability profession with the contribution occurring within the last few years. Nominees will be considered according to the following criteria:

Reliability Contributions

Reliability Technical Contributions

Reliability Management Contributions

Reliability Publications

Contributions to Reliability Education

Profession Service to IEEE

Reliability Society Service

Other IEEE Service Positions

An administrative superior of the nominee (e.g., department head, supervisor, or chapter chair) should make and submit the nomination. The nomination package should consist of a ½ page biography of the nominee plus up to a maximum of four pages of concise descriptions of accomplishments. For technical contributions, concisely describe why the contribution is unique. For managerial and educational contributions, concisely explain the obtained benefits. Please limit identified publications to only those in which the nominee was the sole or principal author. The accomplishments should be organized according to the above-described criteria. Send nominations to the Jr. Past President (j.voas@ieee.org) and copy the Senior Past President (dennis.r.hoffman@lmco.com)."

Reliability Society Lifetime Achievement Award

"The IEEE Reliability Society is soliciting nominations for its Reliability Society Lifetime Achievement Award for 2008. The IEEE Lifetime Achievement Award was created to recognize sustained outstanding contributions to the field of reliability engineering. Typically the contributions will span the career of the individual, usually in excess of 25 years. The contributions meriting this award must clearly be within the area of reliability engineering.

Nominations must be submitted by a peer or supervisor of the nominee. Self nominations or nominations from a member of the IEEE Reliability Society Nominations and Awards Committee will not be accepted. The nomination package should consist of a ½ page biography of the nominee plus up to 4 pages of concise descriptions of the nominee's lifetime accomplishments. Nominations may be submitted until mid-November of the year of award. Send nominations to the Jr. Past President (j.voas@ieee.org) and copy the Senior Past President (dennis.r.hoffman@lmco.com)."

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Chapter Activities

The most recent chapter activity reports are linked below:

[Boston](#)

[Cleveland](#)

[Dallas](#)

[Denver](#)

[Singapore](#)

[Twin Cities](#)

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Technical Activities

Technical Committee Reports

The 2008 Annual Technology Report has just been released. It will be published in the June issue of the IEEE Reliability Society Transactions. This is the first time that the annual report has been published in our transactions. It will also be posted on the reliability society web page. This issue covers new developments in : reliability standards, design for reliability, power networks, MOS technology, prediction techniques, six sigma, software reliability, software trust issues, integrity, CMMI process performance models and reliability, NASA benchmarking initiative, DOD technology report and more.

Society Technical Activity Organization

"Technical operations" is now called "technical activities" to align with the naming used by the IEEE technical advisory board. "Technical activities" is obviously the technical arm of the IEEE Reliability Society. Its charge is to:

- Help incubate new conferences
- Foster ways to get more technical information to our members through:
 - Annual Technical Report that comes out each January
 - Enable a content rich web site that will provide IEEE RS organizational data, technical reports and data, and tools.? These capabilities are under development.?
 - Publicize state of the art work in the IEEE Transactions, Spectrum magazine, our web site, and discussion groups.
 - Enhance the RS promotional flyer with technical activities content.
 - Build templates, guides and resources to guide and mentor new members of the society and profession
 - Interface with other technical societies and collaborate on joint ventures to gain synergy
 - Deliver technical information through: classes, tutorials, DVD's, and online collaboration (meetings)

Technical Activities organization:

Sam Keene VP Technical Activities

Tech Ops Deputy	Dennis Hoffman
Tech Ops Japan	Shuichi Fukuda
Tech Ops Europe	Enrico Zio
Tech Ops Taiwan	Shiuhyng Shieh
Tech Ops Communications	Lon Chase

Technical Pillar leads:

Jim McLinn	System of Systems Development and Performance
Robert Stoddard	Software Development and Performance
Lou Gullo	System/Subsystem Development and Performance
Aaron Dermarderosian	System Foundation Development and Performance

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Announcements

[Call for papers - System Journal, Special Issue on Biometrics Systems](#)

[Call for papers - Transactions on Instrumentation and Measurement](#)

[2008/2009 Reliability & Maintainability \(RAMS\) Symposium](#)

The Reliability Society is proud to sponsor the first annual International Conference on Prognostics and Health Management in 2008. PHM'08 preparations are going according to plan, and the conference is now open for registration. Take advantage of the early registration discount (good through August 15). Website link: www.phmconf.org

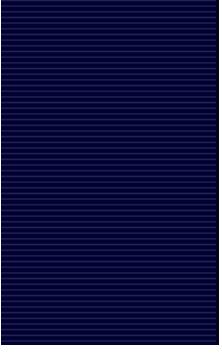
[8th IEEE International Conference on Nanotechnology](#)

[2008 European Symposium on Reliability of Electron Devices, Failure Physics and Analysis \(ESREF\) September 29-October 2, 2008](#)

[2008 Integrated International Reliability Workshop \(IIRW\) October 12-16, 2008](#)

[2008 International Symposium on Software Reliability Engineering \(ISSRE\) November 10-14, 2008](#)

[2008 High Assurance Systems Engineering \(HASE\) December 3-5, 2008](#)



[2009 International Symposium on Quality Electronic Design \(ISQED\) March 23-25, 2009](#)

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Send questions or comments to [Webmaster](#), IEEE Reliability Society.
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DR. FERNANDO GUARIN RECIPIENT OF IEEE FELLOW HONOR

Dr. Thad L.D.Regulinski, FIEEE
Chairman RS Fellow Evaluation Committee

IBM scientist Dr. Fernando J. Guarin received the coveted IEEE Fellow honor on January 1st, 2008. He was cited under the IEEE category of Research Scientist for his contribution in the development and use of material properties of silicon carbide, gallium nitride and silicon germanium among others, to significantly enhance performance reliability of electronic devices. The RS Fellow Evaluation Committee cited him for his pioneering work in the development of a new technique for the growth of silicon carbide and gallium nitride on compliant substances using SOI wafers. Dr. Guarin has published the results of his research in numerous peer- reviewed scholarly journals, the RS Transactions on Reliability among them, and in the proceedings of national and international conferences. He holds six patents in reliability and other areas, which have yielded fabrication improvements, significantly improved reliability, and concomitant cost savings.

Dr. Guarin is the founding member and first president of the Hudson Valley Chapter of the Society of Hispanic Professional Engineers, which serves over **5000** students and **1500** professional engineers in **170** student chapters and **42** professional chapters throughout the United States and Puerto Rico.

Congratulatory expressions can be sent to Dr. Guarin at <guarinf@us.ibm.com>

MICHAEL PECHT, EDUCATOR AND SCIENTIST, RECIPIENT OF THE RS LIFETIME ACHIEVEMENT AWARD

Dr. Michael Pecht, PE, FIEEE, the G.E.Dieter Professor of Mechanical Engineering at the University of Maryland, received the Reliability Society's highest award, the Lifetime Achievement Award, at the RS Awards Banquet in Las Vegas on 26 January, 2008. Prof. Pecht was cited as an educator, scientist and researcher, recognized by his peers in both academia and industry, for his expertise in physics- of- failure methodologies and models, and for reliability engineering design practices.

He was recognized, among other achievements, as the founder and director of the Center for Advanced Life Cycle Engineering (CALCE), whose pioneering research efforts have focused on the development of techniques for the design, analysis, prediction and optimization of systems performance reliability. Under the aegis of CALCE and Dr. Pecht's skilled direction, major efforts were expended on the R&M computer aided design (RAMCAD) with a principal focus on reliability, failure mechanisms analysis and modeling, and physics-of-failure.

Dr. Pecht initiated both the CALCE and the RAMCAD efforts at a most propitious time, when both industry and the military were demanding the integration of R&M into the design process to maximize system reliability, minimize system down time, and contain costs. Both efforts were funded by the Institute for Defense Analysis, the National Science Foundation, and industry consortia during his tenure as director of CALCE.

Prof. Pecht was also recognized for his contributions in directing the development of the IEEE #1312 Reliability Program Standard, and the IEEE #1413 Standard Methodology for Reliability Prediction and Assessment for Electronic Systems and Equipment. Additionally, he was cited for formalizing into the JEDEC Standards the concepts of physics of failure, and failure modes, mechanisms, and effects analysis (FMMEA).

Kudos are extended herewith to Dr. Pecht on behalf of all of us on the RS-ADCOM for his most praiseworthy and exemplary achievements. Congratulatory expressions and other sentiments may be sent to Dr. Pecht at <pecht@eng.umd.edu>

Dr. Thad L.Regulinski, FIEEE
Chair, RS Fellow Evaluation Committee

Understanding Software Fault Tolerance Using a Concept Map

Goutam Kumar Saha

Senior Member IEEE, gksaha@ieee.org

This article graphically describes the software fault tolerance concepts and their relationships. The work intends to represent software fault tolerance knowledge structures that humans store in their minds. Important concepts have been graphically structured, co-related and presented as a concept map for quick easy meaningful learning. A Concept Map comprises of concepts and propositions. Concept Maps are the graphical representations of knowledge that are comprised of concepts and the relationships among them.

Concepts are nothing but the generalization of knowledge of ideas conveyed in some forms for example, books, documents, speeches or lectures. Concept is nothing but a perceived regularity in events or objects. Propositions state how concepts are linked together. Concept maps are 2-dimensional representations of cognitive structures showing the hierarchies and interconnections of concepts involved in a discipline or a sub-discipline. This is an important tool for developing our both sensing and intuitive skills. Sensing skill is important to focus on already known and new information, whereas intuition skill helps us to construct relationships. It is to organize the information by groups. In a concept map, the nodes (in circles or rectangles) have been used to enclose the key concepts and these nodes have been linked with lines (normally directed downward) and words (e.g., verbs, preposition etc.,) that describe the connection. Professor Joseph Novak developed concept maps that represent

organized knowledge. A domain expert has hierarchically structured knowledge. Organized knowledge is comprised of concepts and propositions that are hierarchically structured in cognitive structure to aid creativity that begins with infants. Creativity is must to see interrelationships between various map segments. We need context dependent organized knowledge for effective teaching and effective learning and for answering focus questions. Creativity only can produce a very high level of meaningful statement. Concept is the highest level of “abstraction” for the map but it is the lower level of abstraction in the ontology. The characteristics of concept map are: (a) a hierarchical concept map contains the most general concept at the top and the most specific one at the bottom, (b) cross links are to link different map segments, (c) examples are to clarify the meaning of a concept.

In order to construct a concept map we must have familiarity with the general topic as well as an in-depth knowledge on a specific topic such as on software fault tolerance here. For developing concept maps, we should follow the guidelines: (a) To note the major concepts, (b) To note more specific concepts for each major concepts for grouping related ideas, (c) To inter link the major ideas, (d) To write linking words, (e) To do cross-linking between map segments (arrowhead for upward linking), and (f) To label these lines with linking words or phrases to form meaningful statements.

Software fault tolerance concepts and their relationships have been described lucidly by a Concept Map. More specific concepts about Software fault tolerance could be described in details by other concept maps and those could be

integrated for navigating between them through hyperlinks. Concept maps are useful as a means for representing the emerging science knowledge and for increasing meaningful learning in sciences in contrast to simply memorizing the text. Representing the expert knowledge of individuals or of teams in research, government, business and in education becomes easier by this useful concept mapping tool. It is to stimulate our idea generation and creativity. It is definitely carving out a strong position for brainstorming, complex ideas communication, and formal argument representation. Formalized concept maps are being used in software design or in UML.

Further Reading:

- * Goutam Kumar Saha, "Software – based Low – Cost Fault Detection for Microprocessors," IEEE Potentials, Vol. 27, No. 1, pp. 37-41, Jan-Feb 2008, IEEE Press, USA.
- * Goutam Kumar Saha, "Software based Fault Tolerance: a Survey," ACM Ubiquity, Vol.7, No. 25, pp. 1-15, July 2006, ACM Press, USA.
- * Goutam Kumar Saha, "Understanding Dependable Computing Concepts," ACM Ubiquity, Vol.8, No. 44, November 2007, ACM Press, USA.
- * W. Torres-Pomales, "Software Fault Tolerance," NASA Report (No. L-18034), 2000.
- * Goutam Kumar Saha, "Web Ontology and Semantic Web," ACM Ubiquity, Vol.8, No. 35, September 2007, ACM Press, USA.

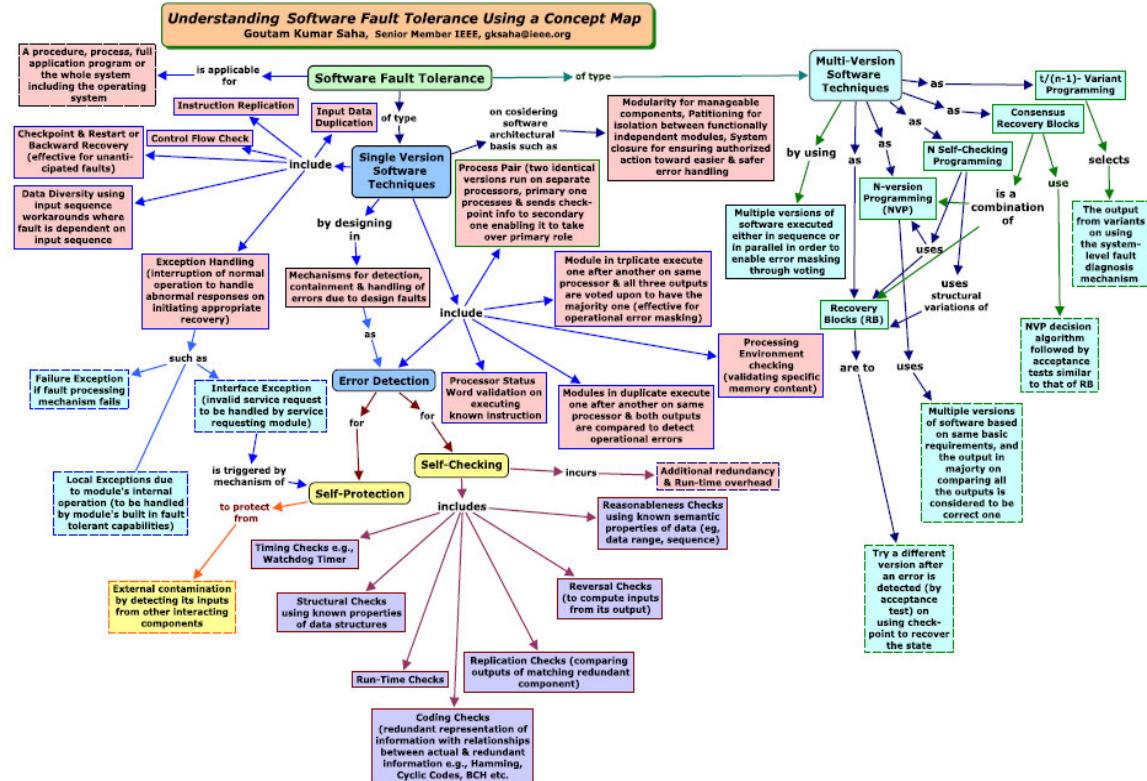
* Goutam Kumar Saha, "Fault Tolerance Terminology," IEEE Reliability Society Newsletter, Vol.54, No. 1, pp. 1-5, March 2008, IEEE Press, USA.

* Goutam Kumar Saha, "Software Implemented Self – Healing System," Journal of the Latin Americal Centre for Informatics Studies, Vol. 10, No. 2, December 2007, CLEI Press, Chile.

* IHMC Web Resources, IHMC, USA.

* Goutam Kumar Saha, "Software based Transient Fault Tolerance," International Journal of Mathematics & Computer Science, Vol. 1, No. 2, 2006, France.

* Goutam Kumar Saha, "Understanding Software Testing Concepts," ACM Ubiquity, Vol.9, No. 6, February 2008, ACM Press, USA.



HALT (Part 2)

Key Points of HALT

Lou Gullo

IEEE RS Newsletter

This article is part 2 of a 4 part series of articles to be published in 4 consecutive IEEE Reliability Society (IEEE RS) newsletters on Highly Accelerated Life Testing (HALT). An introduction to HALT was published in the previous newsletter in March 2008. This article, part 1 of HALT, included a comparison to traditional reliability tests. As described in the March newsletter, HALT is a method used to rapidly accelerate failure mechanisms, which may be latent manufacturing defects or design weaknesses. The failure acceleration occurs through the application of a combination of environmental and electrical stress conditions, such as temperature, vibration, humidity, power and voltage. HALT uses accelerated stresses that are applied non-uniformly in varying stress combinations, which are called step stresses, and various environmental conditions, called load case conditions. Further details on what HALT is and what HALT is not are included in this article. Also, a discussion on HALT time compression and test coverage are included in this part 2 of the 4 part series.

As mentioned in the previous newsletter article, Dr. Gregg K. Hobbs pioneered the HALT process and coined the term, HALT. Dr. Hobbs states: “in HALT, every stimulus of potential value is used under accelerated test conditions during the design phase of product in order to find the weak links in the design and fabrication processes. Each weak link found provides an opportunity to improve the design or the processes, which will lead to reduced design time, increased reliability, and decreased cost.”¹

To continue with the explanation of HALT, I explored multiple answers to the question...What are the key points of the HALT Process?

- Develop a HALT with discrete and combined load cases and step stress conditions
- Time compression to find design weaknesses faster
- Test coverage with internally designed built-in-test capability and the use of adequate external test equipment to detect faults and ensure high test coverage
- Understand the capability of the design
- Define the Fundamental Limit of Technology – determine operating and destructive limits
- Build confidence in the design performance through knowledge of the design margin and Factors of Safety (FOS)
- Precipitate and detect latent failures and defects – search for the weak links
- Detect all failure sources (hardware and software)
- Increase stress conditions until unit fails or is destroyed or to a predefined limit
- Indicate sensitivity to stresses
- Determine the product’s robustness or improve the product’s robustness

¹ Accelerated Reliability Engineering – HALT and HASS, Hobbs, Gregg K., PhD, published by John Wiley & Sons Ltd, June 2001

- Correct inherent design and manufacturing process flaws
- Perform Failure Analysis on every failure
- Continue HALT through an iterative process
- With corrective action, this improves product design margin
- Determine the size and weight of the equipment to be tested to determine the chamber size and the weight handling capability of the vibration table
- Design test fixtures with high mechanical transmissibility and low thermal mass
- Used to develop the Highly Accelerated Stress Screen (HASS) and Highly Accelerated Stress Audit (HASA) profiles for production testing
- Establish groundwork for future reliability testing to generate reliability performance metrics

To consider the meaning of HALT from another angle, lets analyze the question... What a HALT is not?

- HALT has no Pass/Fail criteria
- HALT is not a qualification test
- HALT is not intended to find and fix all failures - Resolve the failures that affect product reliability, and develop an awareness of failure modes at stress conditions well beyond the design specification limits
- HALT is not a test that is used to calculate the demonstrated reliability of products. Reliability Tests such as Accelerated Reliability Testing (ART) or Accelerated Life Testing (ALT) are used to calculate reliability performance metrics, such as Mean-Time-Between-Failure (MTBF)
- HALT is not a method to calculate acceleration factors for failure mechanisms
- HALT does not always test to destruction limits if the destruction limit is already well understood through vendor data or other analysis – HALT may use pre-established test limits (preset stress limits in the HALT plan)
- HALT does not take a long time, such as weeks or months, to find weaknesses in a product design, and recommend fixes in a product design to improve reliability

Now lets consider the question... Why HALT became widely accepted in the commercial product design marketplace in the early to mid-1990's?

The reason that HALT achieved acceptance in commercial design applications is due to its ability to rapidly identify design weaknesses early during the product development phase. The initial success of HALT resulted from short cycling the design process to determine design margin and establish design maturity faster than the traditional reliability test approaches. Short cycling compresses the time spent in development testing by revealing defects and product vulnerabilities faster than common accelerated test methods and their associated acceleration factors. During development testing the precipitation of latent design and manufacturing defects, and early life wearout mechanisms are accelerated faster than the normal evolutionary process of detecting failures in the field (customer use applications).

Time Compression

One key point of HALT is time compression. Time compression in HALT does not result in acceleration factors that may be calculated for any particular stress condition, but does result in the acceleration of failure mechanisms. This time compression causing an acceleration of failure mechanisms results from:

- Stresses that are applied higher than expected in the field application environment
- Stresses that are applied beyond the product design's specifications and operating requirements
- Higher vibration stresses beyond where Miner's Criteria can approximate accumulated fatigue damage
- Hotter test conditions and colder test conditions beyond where thermal acceleration models exist to substantiate an acceleration factor for thermal stress conditions
- Increased environmental cycling rate which can be modeled by exponential acceleration of stress vs. number of stress cycles
- Higher temperature cycling conditions beyond where Coffin-Manson's model is useful for calculating the acceleration factors from temperature cycling stresses. Coffin-Manson's model is useful when the temperature cycling stresses are constant and uniformly applied, but this is not the case for HALT since HALT uses accelerated temperature cycling stress conditions.

Time compression or failure mode acceleration is accomplished through exercising a single stress condition or combinations of stress conditions. These stress conditions typically are some combination of temperature extremes (hot and cold), temperature cycling (or thermal shock), vibration (typically, 3 axis random vibration with six degrees of freedom), mechanical shock, humidity, power, operating profiles, voltage, current, duty cycle, and frequency. Stresses may be applied individually or in various types of combinations, such as a combined temperature cycling with voltage cycling and vibration cycling. For each stress condition, an acceleration factor may be calculated and measured. Accelerated Life Tests (ALTs) are performed where one output from this type of test is an acceleration factor based on a acceleration model in terms of test time equated to actual customer use time. For instance, an ALT with temperature cycling slew rate of 10 degrees C per minute may be found to have an acceleration factor of 10, which means that one hour in test is equivalent to 10 hours in the customer use application and normal field operating environment. If the ALT condition changes to thermal shock with a slew rate of 100 degrees C per minute, the acceleration factor may be 100 and the value of the time compression increases by a factor of 10 compared to temperature cycling.

Test Coverage

Besides time compression, another key point of HALT is test coverage. Test coverage is the method to analyze the extent of the ability of the design and external test equipment to identify faults in the hardware being tested. Test coverage is another way to say fault coverage or probability of fault detection. It is meant to reveal operational and environmental vulnerabilities. Test coverage is not a method to determine if all the design specification requirements are met by the product or system design, or a test of the product or system to meet its requirements.

In HALT testing an electronics box (multiple circuit cards packaged within an enclosure), the electronics cards are exposed to the combined accelerated environments. During this testing, the electronic test points must be accessible to permit monitoring circuit performance parameters. This is done when a formal test station is not available. Test equipment probes are attached directly to test points and circuit traces or component leads to ensure the design is operating as planned. The duration of each step within a step stress profile is based on the soak time and the length of time to perform a test. The soak time is the amount of time to determine that the equipment under test has reached thermal equilibrium. After the soak time, the additional time in the step is the duration to perform the electrical test on the equipment under test. The amount of stress increase after each step is based on the sensitivity of the equipment to the stresses and how much time the analyst wants to take to determine the fundamental limits of the technology, where the operating design limits are for determining operating margin and destruct margin.

Key Points of HALT Test Coverage Analysis:

- Must have good test coverage of all operating states, branches and conditions for full detection. An example of good test coverage might be > 90% of the circuit tested for faulty conditions. Without good test coverage, you don't know how effective your testing has been and how many faults might remain.
- An undetectable problem will become a detectable problem at some point in the product's life.
- An undetectable problem can be an intermittent that will plague the product over its field deployment even when the test coverage is 100% of all functionality tested. Test coverage should include the ability of the test to detect time dependent failure mechanisms, such as probabilistic mechanisms, as well as functional dependent failure mechanisms.
- Test coverage analysis is measured as a percentage of the design that is testable, and able to detect faults, such as the product's built-in-test (BIT) design has 97.5% probability of fault detection, and 99.8% probability of fault detection when connected to external test equipment.

The next IEEE RS newsletter article, part 3 of HALT, will focus on other key points of HALT.

This is the second of a 4 part series on HALT that I plan to publish in the IEEE-RS newsletter.

*Lou Gullo
Raytheon
June 6, 2008*

Student Outreach Symposium, University of Padova

A joint student outreach symposium was held at the University of Padova, Italy on May 29-30, 2008. The ‘System and Device Reliability in the Nanoelectronics Era’ Symposium was sponsored by the Department of Information Engineering at the University of Padova and the Reliability Society. Professor Enrico Zanoni and Professor Gaudenzio Meneghesso provided assistance developing the program, obtaining local financial co-sponsorship and with advertising and local arrangements.

The speakers included Reliability Society members as well as regional industrial and academic experts in the reliability field. The well attended symposium was open and free of charge to all engineering undergraduate students. In addition to the technical program the benefits of IEEE student membership were presented. A luncheon was held on the opening day to provide the student attendees an opportunity for networking with graduate students, academic and industrial reliability experts. Additional networking opportunities for the speakers at the close of the symposium included a visit to the Scrovegni Chapel, the library of the Seminario Vescovile and a tour of the oldest section of the University of Padova.

The invited symposium speakers and their presentation titles were:

- Developing world class products with "Design for Six Sigma" Tools
Dr. Samuel Keene, Six Sigma Master Black Belt, Keene and Associates
- Microelectromechanical Systems (MEMS)
Richard L Doyle, P.E. Consultant
- Rf-MEMS Reliability
Dr. Gaudenzio Meneghesso, University of Padova
- Safety and Reliability on the NASA Space Shuttle
Alfred Stevens, United Space Alliance (retired)
- Ionizing Radiation Effects on Electron Devices and Integrated Circuits
Prof. Alessandro Paccagnella, University of Padova
- Focused Ion Beam Technology and Applications to Microelectronics
Ms. Marsha Abramo, IBM Systems and Technology Group
- Laser Diodes Fundamentals and Reliability
Prof. Massimo Vanzi, University of Cagliari
- Electro Static Discharge (ESD) effects on CMOS ICs
Dr. Dimitri Linten, IMEC Leuven
- GaN Light Emitting Diodes: the solid state lighting revolution
Karl Engl, OSRAM Opto Semiconductors
- Reliability of GaN Optoelectronic Devices
Dr. Matteo Meneghini, University of Padova
- Reliability of GaN Microwave Transistors
Dr. Enrico Zanoni, University of Padova

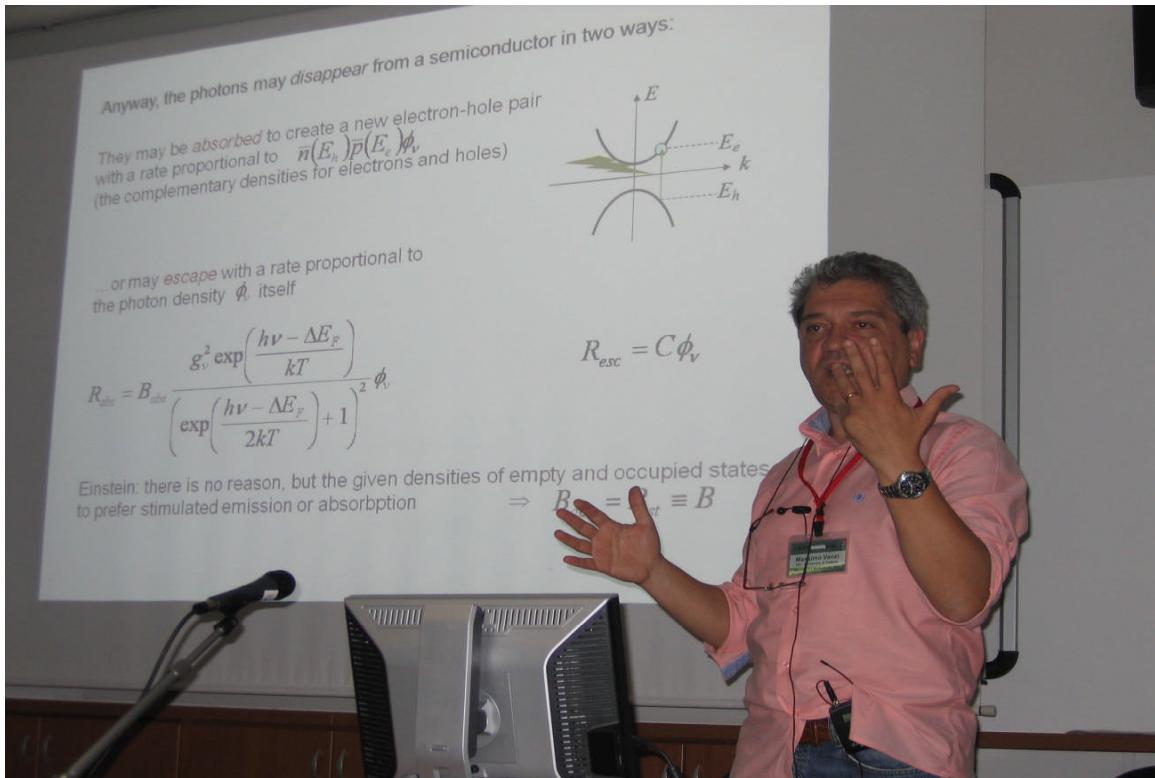
The following pictures were taken at the symposium:



Alfred Stevens, United Space Alliance (retired)



Dr. Gaudenzio Meneghesso, University of Padova



Prof. Massimo Vanzi, University of Cagliari



Ms. Marsha Abramo, IBM Systems and Technology Group



The IEEE Reliability Society Scholarship

<http://www.ieee.org/portal/site/relsoc/>

Description:

This scholarship recognizes active students who are members of the IEEE and who demonstrate promise in their academic and/or professional Reliability Engineering accomplishments.

Prize:

Multiple \$2,000 scholarships are available per year.

Eligibility:

Full-time Graduate Students, Seniors, and Juniors in degree programs in engineering, computer science, or other well-defined reliability-related field who are active members or student members of the IEEE. At least one course in Reliability Engineering or closely related field should be completed. Minimum overall grade point average should be 3.0 for undergraduate students and 3.5 for graduate students.

Basis for Judging:

- Involvement in IEEE activities – 30%;
- Academic achievement (with preference given to those who demonstrate excellence in reliability) – 40%;
- Extracurricular activities related to your academic/professional interests – 10%; and
- Letter of evaluation by at least one of the instructors who taught you a course with reliability engineering content – 20%.

Deadline:

Multiple scholarships will be awarded each calendar year. Submission deadlines are:

- Summer Term – April 1st
- Fall Term – July 1st
- Winter Term – November 1st

Note: All material must be received by the submission deadline.

Submission Requirements:

- The IEEE RS Student Scholarship Application;
- An essay (not to exceed two pages) describing your academic accomplishments, professionally related extracurricular activities, work history, career goals, and the relevance of reliability engineering to them;
- An official academic transcript of all college courses completed;
- A degree plan with reliability-related courses clearly identified; and
- One or more recommendation letter(s) from the instructor(s) of reliability-related course(s) you have successfully completed.

Contact:

IEEE Reliability Society Scholarship

Attn: Alfred M. Stevens

200 Cordoba Court

Merritt Island, FL 32953



IEEE Reliability Society Scholarship Application

All APPLICANTS – Please provide the following information along with this application:

1. An essay describing your academic accomplishments, professionally related extracurricular activities, work history, career goals, and the relevance of reliability engineering to them.
2. An official academic transcript of all college courses completed.
3. A degree plan with your reliability-related courses clearly identified.
4. One or more recommendation letter(s) from the instructor(s) of reliability-related course(s) you have successfully completed.

Applications will be considered incomplete until all documents are received. With the exception of signatures and dates, documents should not be handwritten.

Please select your current level of education:

Junior

Senior

MS/ME Student

PhD/DE Student

Last Name	First Name	MI	GPA/Scale (e.g. 3.5/4.0)
Student Permanent Address		Student School Address	
School Name and Address			School Telephone Number(s)

Major Field of Study (be specific – e.g. Electrical Engineering, Industrial Engineering, Computer Science, Physics, etc):

Email Address:

Authorization to Release Scholarship Information

Federal Law requires that we obtain written permission before releasing information to the news media regarding scholarship recipients. If you wish to give such permission, please sign. If you do not sign, we will not release information to the media. However, it will not adversely affect your scholarship application.

Applicant's Signature and Date

I certify that all statements in this application and related materials are correct.

Applicant's Signature and Date

Submission Deadlines (Note: All material must be received by the appropriate submission deadline):

- Summer Term – April 1st
- Fall Term – July 1st
- Winter Term – November 1st

Please submit all application material to:

IEEE Reliability Society Scholarship
Attn: Alfred M. Stevens
200 Cordoba Court
Merritt Island, FL 32953

How to Become a IEEE Fellow

Do you know an IEEE colleague who has made outstanding contributions to the electrical and electronics engineering profession?♦ If so, consider nominating him or her as an IEEE Fellow.♦ The deadline for receipt of complete IEEE Fellow nominations for the Class of 2010 is 01 March 2009.

At the time the nomination is submitted, a nominee must be an IEEE Senior Member whose membership is current and who has completed five years of service in any grade of membership.♦ *Note: IEEE affiliate membership does not apply.*♦ The nominee can come from any field, including academia, government and industry.

Any person, including a non IEEE member, can nominate an IEEE Senior Member.♦ The Nominator cannot be a member of the IEEE Board of Directors, the IEEE Fellow Committee, an IEEE Technical Society/Council Fellow Evaluating Committee Chair, a member of IEEE Technical Society/Council Fellow Evaluating Committee reviewing the nomination, or IEEE Staff.

♦The nominator is responsible for:

- ♦ Preparing the IEEE Fellow Grade Nomination Form
- ♦ Soliciting at least five, but no more than eight references capable of assessing the nominee♦s contributions.♦ The references must be an IEEE Fellow in good standing.♦ References cannot be members of the IEEE Board of Directors, the IEEE Fellow Committee, IEEE Technical Society/Council Fellow Evaluating Committee reviewing the nomination, the Nominator or IEEE Staff. *Note: References will be accepted if a reference is an IEEE Senior Member in good standing and the nominee they are serving as a reference for resides in Region 9.*
- ♦ Identifying an IEEE Society/Council whose evaluating committee will assess the nominee♦s technical qualifications and contributions
- ♦ The option of soliciting no more than three Endorsements that can attest to the nominee♦s field of technical accomplishments.♦ Endorsements cannot be members of the IEEE Board of Directors, the IEEE Fellow Committee, IEEE Technical Society/Council Fellow Evaluating Committee reviewing the nomination, the Nominator or IEEE Staff.

The process consists of two reviews.♦ The first evaluation is completed by the IEEE Society/Council that the Nominator identified on the nomination form. The Technical Society/Council evaluation is extremely important, because it is an impartial and even-handed view of the nominee♦s merit, by persons who are familiar with his or her work.♦ Once the Technical Society/Council review is completed, their comments are given to the Fellow Committee.

All nomination materials are forwarded in confidence to the IEEE Fellow Committee, consisting of 52 members, who are all IEEE Fellows selected to represent the 10 IEEE Regions, and have expertise in the technical areas represented by IEEE Technical Societies/Councils.

The Fellow Committee recommends nominees to the IEEE Board of Directors, according to the following criteria:

- ◆ Significant contributions as Application Engineer/Practitioner, Educator Research Engineer/Scientist or Technical Leader.
- ◆ Evidence of technical accomplishments
- ◆ Evaluation by the IEEE Technical Society/Council selected by the nominator
- ◆ Confidential opinions of references and endorsements
- ◆ Service within IEEE and/or other professional engineering organizations
- ◆ Total years in the profession

The Fellow Committee submits its nominees to the IEEE Board of Directors during the 3rd Quarter, and the Board acts upon those recommendations at its year-end meeting.

According to IEEE Bylaw I-306-8, the total number of Fellow recommendations in any one-year must not exceed one-tenth of one percent of the voting membership on record as of 31 December of the year preceding.

For additional information, nominations instructions, forms and more please visit
<http://www.ieee.org/fellow>

IEEE Reliability Society Newsletter Submission from the Boston Chapter June 2008

Greetings, we have completed another successful monthly meeting series for the 07-08 the season! As a follow up to this year's meetings we are hosting Technology Development workshops for June and July. To our chapter members & guests, have a great time over the summer. Please check for updates on the website periodically, about our upcoming 08-09 meeting season!

07-08 meetings: (March - May)

In **March**, Joseph Raynus from Lexington based ShareDynamics presented "*Improving Software Reliability by Connecting Measurements to Key Process Areas by using Goal-Question-Metric (GQM) method*" at EMC Corporation's 171 South St. facility. Joe reviewed processes, methods & techniques for collecting & analyzing data for assessing software development processes. The Goal-Question-Metric method was described in detail and is a technique that can be used in software or hardware based development programs. The metrics & assessments are used to mitigate risk & make informed decisions during product development stages. We had a total of 28 members & guests in attendance for this meeting.



April Meeting held at Teradyne in North Reading MA. 29 members & guests in attendance



Lou Gullo (Raytheon Portsmouth) reviewing the IEEE Standards association & the Standards approval process

- April 2008 monthly meeting, held at Teradyne Inc. Images courtesy of AdCom member Aaron D. (Raytheon)

In **April**, Senior IEEE-RS AdCom member Lou Gullo (Raytheon Company) presented "*IEEE Reliability Standards Development*" at Teradyne Corporation in N. Reading. Lou talked about the mission and

purpose of the IEEE Standards association, which is an internationally recognized standardization entity, within the IEEE. Lou provided examples of existing and proposed standards currently under consideration by IEEE-SA. Reliability Society sponsored proposed standards IEEE P1624 (organizational reliability) and IEEE P1633 (recommended practice for software reliability predictions & assessment) were reviewed. An overview of the application, evaluation, voting and ballot methods utilized by IEEE-SA was discussed to give attendees insight into the approval process. Attendees were encouraged to consider joining IEEE-SA & participating in the member standards review process. A total of 29 members & guests were in attendance at this meeting.



May meeting at RSA, the security division of EMC, Bedford MA. ; Bob Kuper- ARDEC presenting



40 members & guests in attendance ; AdCom member Joe Dzekevich presents Bob w/ a plaque

- May 2008 meeting at RSA (Bedford MA.). Images courtesy of AdCom members Aaron D. (Raytheon) & G. Kedem (RSA)

In **May**, our intended December annual keynote speaker Robert Kuper Reliability Dean, from the U.S. Army Armament Research Development & Engineering Center (ARDEC) was on hand to present *“Developing & Deploying Army Life Cycle Cultural Changes in Reliability Engineering”*. Bob presented updates on Army & Department of Defense (DoD) Reliability Improvement initiatives. This was a follow up to a key note presentation (Dec. 2005) where he reviewed “ATRIP” The Army’s Transformation Reliability Improvement Program. Bob talked about some of the cultural changes that are taking place to ensure mission success & system reliability. ARDEC’s efforts include collaborations with NASA and Industry professional societies. Bob was presented with a Plaque by the Boston chapter, at the end of the meeting, in appreciation for his industry wide efforts to promote reliability engineering best practices. We had a total of 40 members and guests in attendance for this meeting.



Gary Rohlke, Sypris T&M providing facility overview ; 35 members and guests attended the June workshop

- June 2008 Technology Development workshop, Sypris Test & Measurement (N. Billerica MA). Images courtesy of AdCom member Aaron D. (Raytheon)

In **June**, the chapter's Technology Development Committee held a workshop at Sypris Test & Measurement in North Billerica MA. This included presentations by Gary Rohlke & Jack Mushow (Sypris) on the companies facilities and services. Arvin Blank followed the overview with a presentation on Reliability test methods & accelerated life test strategies. Sypris resources were on hand to provide everyone with a tour of the testing facilities. A special thanks goes to AdCom members Eddie Robins, Rudy Bauer & Sadie Ganas (Sypris) for arranging a very informative meeting! We had a total of 35 members attend the workshop. If you would like to learn more about Sypris and their test capabilities, please contact Sadie at: Sadie.Ganas@Sypris.com

Upcoming meetings:

We have one more Technology Development workshop scheduled over the summer,

In **July** (Wed. July 9th), Gene Bridgers from Mercury Computer will host a workshop titled: "*Automated MTBF-DfR Demonstration*". Gene will review some of the Design for Reliability tools that Mercury uses during product development. He will also demonstrate some of the best practice techniques utilized to predict & assess product reliability. This workshop will be held at Mercury Computer's headquarters in Chelmsford, MA.

For next year, we are planning a kickoff meeting which will highlight Reliability issues with respect to lead free (RoHS compliant) interconnects & platings. We also plan to cover ESD, counterfeit electronics & Reliability based accelerated test strategies in some of the 08-09 meetings. Please check our website periodically for updates on these upcoming events!

<http://www.ieee.org/bostonrel>

If you would like to present a reliability based topic at a future meeting, have meeting topic suggestions or ideas about how to improve our meetings, we want to hear from you! Please send an e-mail to any of the AdCom members or go to our website and Click on: [Suggest a Monthly Meeting Topic](#).

To participate or provide input to chapter technology development activities, sign up to become a TDC committee participant using our website. Click on: [Join Technology Development](#).

You can also be added to the chapter e-notice distribution via our website, click on: [Join our E-Mail Distribution List](#) or send a request to: dermarderosiana@ieee.org

Best Regards,

Aaron C. DerMarderosian Jr. - Chair, Boston Chapter

Cleveland Chapter

Fall 2007

The Cleveland Chapter had four meetings in this period.

PAST MEETINGS

The January meeting was an advanced look at NASA 50th Anniversary Project. Jimmy Simek explained the plan for this celebration. We should: Make plans to join the celebration! Lewis Field held open house on May 17 and 18, 2008. Plum brook had their open house on May 31 and June 1, 2008. A great crowd of about 50,000 people attended. The retiree reunion is scheduled for July 18 and 19, 2008. The employee and retiree picnic will be held on July 18, 2008. There will be a gala celebration on August 29, 2008. Tickets cost \$12.00. It was a good meeting. The food was great.

The March meeting was on the Yankee Air Museum. Dave Steiner, Vice President, explained how the YAM was able to celebrate its 25th year of service to the community. When the historic YAM hangar burned to the ground in a spectacular fire October 9, 2004, probably not many people thought the museum would be around to celebrate its 25th year. Building on a foundation of volunteer hours and tremendous determination, the YAM is alive and well. The Michigan Aerospace Foundation, headed by Dennis Norton, Yankee founder and member #1, has been instrumental in helping to formulate plans and major fund raising efforts to rebuild the museum. There is a lot happening at YAM. We were invited to support the action, have fun, and keep them flying at the museum. This was a very informative meeting, good fellowship, and great food made it a fun event. Thanks to Jimmy for arranging this great meeting!

The April meeting was on Sustainability. Linda Sekura explained the green efforts that are being made at Glenn to protect our environment. Media reports tell us that unless we act now, global warming may cause significant climate change with potentially dire consequences for us and our environment. Many believe that human activities are a major cause of global warming. Rising temperatures could intensify storms, floods, and droughts. The Sustainability Specialists at GRC are hard at work doing research to help solve these problems. It was a good meeting. The food was great.

The Election of Officers was on May 30. It was held at the Picnic Grounds. Ernie Bartone and Jimmy Simek took care of the logistics. The steaks and fish were excellent again this year. There are a few changes in the Officers and Committee Chairs for next year. Please try to bring new members into the Chapter so we can keep active. It was a great roast with a lot of news; fun, and good cooking for a delicious meal. See you in the fall. Our next meeting will be in September.

CHAPTER ACTIVITIES

We are supporting meetings and conferences on the Management Committee, with papers, tutorials, and session Chairs and suggestion topics. The Chapter Staff are all working to build our membership. Our golf outing, social events, and technical meetings are working to keep the members active. Each member is trying to bring an associate to activities when they can.

The Technology Symposium and Risk Management Conference will be held at the Ohio Aerospace Institute in June and September 2009. There will be presentations, exhibits, training, and splinter meetings in the three and one half day activities. Award for the best presentation is given. These activities provide the Safety and Mission Assurance (SMA) community and Project personnel with a unique opportunity for interchange and interaction on innovative assurance technologies and tools. It promotes dialog and co-operation with the Project Managers, Contractors, and Safety and Mission Assurance Managers. .

Overall, here in Cleveland we are having fun, staying active, and serving the needs of our members.

Regards,

Vince Lalli,
Chair

Dallas Chapter Activities

The Dallas Chapter held the following meetings during the spring. The chapter takes the summer months off but will resume meetings in the fall.

Title: "Warranty Data Analysis: Quality, Reliability, Forecasting and Design Improvements"

Date: April 17, 2008

Speaker: Andre Kleyner



Program Summary:

Discussion of warranty data analysis with the illustrative example from the automotive industry. This presentation will show how the engineering and statistical analysis of warranty data can provide the key information to evaluate the product's quality, reliability, and drive the necessary design improvements.

Outline:

Warranty data in general and automotive warranty data in particular

Types and formats of warranty data

Warranty data analysis:

Engineering analysis

Actuarial analysis

Financial analysis

Quality analysis

Reliability analysis

Warranty forecasting using Monte Carlo simulation

Cost models and life cycle cost optimization

Design improvement closing the feedback loop

Speaker:

Andre Kleyner is a Reliability/Quality Sciences Manager with Electronics & Safety division of Delphi Corporation. He has over 20 years of engineering, managerial, and research experience, most of which from automotive electronics industry. He received the doctorate in Mechanical Engineering from University of Maryland, and Master of Business Administration from Ball State University. During his career in the industry Andre developed and taught many training and certification courses for reliability, quality, and design engineers. Dr. Kleyner is a senior member of American Society for Quality (ASQ) and a Certified Reliability Engineer. He is a recipient of P.K. McElroy award for the best paper at 2003 Reliability and Maintainability Symposium (RAMS). He holds several US and foreign patents and authored multiple papers on the topics of vibration, statistics, reliability, warranty, and lifecycle cost analysis.

Title: "X-ray Inspection for Electronics Quality and Reliability"

◆◆◆◆◆◆ Date:◆◆◆◆◆◆ May 22, 2008

◆◆◆◆◆◆ Speaker: ◆Glenn Robertson, Process Sciences Inc.◆

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Program Summary:

X-ray-based inspection has become an important tool for process development, quality assurance, and failure analysis in electronics. The technology of X-ray inspection has advanced in a number of ways over the last several years.◆ Hardware and software improvements have resulted in X-ray inspection systems that are well-suited to many applications in electronics.◆ Specialized applications such as Laminography and Computed Tomography have been developed and used successfully.

In this presentation, X-ray system components and their effects on machine performance will be examined.◆ We will also compare Laminography and CT with real-time 2-D inspection.◆ Finally, examples will be presented on a variety of process control, quality assurance and failure analysis applications.

Speaker:

Glenn Robertson is a Process Engineer and Technical Trainer with Process Sciences, Inc. in Leander, Texas.◆ He holds degrees in Physics and Materials Science, and has worked in the fields of Optoelectronic components, Optical hybrids, and PCB assembly.

Denver Chapter

The Denver Chapter will sponsor a \$1,000 student scholarship for the best paper/presentation of a student at Colorado University. ♦ We also invite student chapter members to all of our meetings.

Sam Keene
Denver chapter chair

Contribution to IEEE Reliability Society Newsletter by Singapore REL/CPMT/ED Chapter May 2008

In the past three months the Singapore Chapter's main activities have been planning for its two flagship conferences IPFA in July and EPTC in December. For IPFA the final touches are being made to the program which will include over 50 papers presented orally together with 20 poster presentations. As well as the submitted papers, there will be 6 invited papers and exchange papers from ISTFA and ESREF. Two keynote papers will be given by very prominent experts in their fields, Professor Dimitri Antoniadis from MIT, USA and Dr. Raj Master, from AMD, USA. More information on IPFA can be found at the website: <http://www.ieee.org/ipfa>

EPTC 2008 will be held in Singapore from 9 to 12 December 2008. Over 250 abstracts have already been submitted and the deadline for abstract submission has been extended to 15 June. There will be keynotes Speeches by the well-known experts Dr. G.Q. (Kouchi) Zhang, from NXP, Prof. Michael Pecht from University of Maryland and Prof. CP Wong from Georgia Tech. This will be the 10th Anniversary of EPTC so there will be special celebrations, social events and networking activities. Full details of EPTC can be found at the website: <http://www.eptc-ieee.net>

Twin Cities IEEE RS Chapter Report may 2008

The Twin Cities RS chapter was active during the winter of 2008. Two members attended the IEEE RS meeting at RAMS (Jim McLinn and Larry Akre) and participated in the meetings. Local chapter activities were also maintained.

On February 19 had Dan Hoolihan, local EMC expert spoke in front of 21 people at the RS chapter meeting on EMC and Reliability. Dan provided examples of how unattended EMI/EMC problems can impact the reliability of a product.

March 18 th had Dennis Arter, of the Columbia Group, Kennewick, Washington speaking on ♦The theory of everything♦ before a crowd of 23 at the RS chapter meeting.♦ Dennis showed how related many different things were.

April 15 was another out of town speaker. Forrest Breyfogle, author and consultant from Austin, Texas spoke on ♦Design for Six Sigma and Reliability♦ presented an extended case study showing how a DOE can be used to estimate longevity with a small sample. A house filling crowd of 37 attended this session.

On May 20 th had local speaker Chris Strand of Unisys talking about some of the problems with implementing ROHs for components. He showed examples of soldering unreliability and even Tin whisker growth. Twenty people attended.

New officers and directors were elected for the coming year and a planning session was established for June.

♦James McLinn
Chapter Treasurer
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CALL FOR PAPERS

IEEE Systems Journal Special Issue on Biometrics Systems

The increasing needs for security as well as medical diagnosis make biometrics more and more valuable world-wide, both as theory; technologies, design methodologies, and applications are concerned.

To create a biometric system various issues need to be studied in an integrated way: from sensing to measurement procedures, from signal analysis and interpretation to quality assessment, from feature extraction to classification and analysis, from knowledge creation to extraction, from algorithms to data structure, from computational complexity to system performance, from system engineering to software engineering, from privacy to social implications, and much more. Integration and cooperative combination are another key aspects if biometrics systems and applications.

This special issue is directed to collect original papers that address any aspect of the design, implementation and application of biometrics systems, by focusing on a system-level perspective. The detailed call for papers is available at <http://www.dti.unimi.it/~piuri/pages/ISJ-SpecialIssueBiometricsSystemsCFP.pdf>

The submission deadline is January 15, 2009. Acceptance notification is expected by April 15, 2009 and publication in August 2009.

Guest Editors of this special issue are: Vincenzo Piuri, University of Milan, Italy; Jie Tian, Chinese Academy of Sciences, China; and Evangelia Micheli-Tzanakou, Rutgers University, USA.

Questions about the special issue should be directed to Prof. Vincenzo Piuri (vincenzo.piuri@unimi.it).

CALL FOR PAPERS

IEEE Transactions on Instrumentation and Measurement Special Issue on Biometric Instrumentation and Measurement

Biometrics is a growing and important applications area receiving significant interest as a result of the criticality and the social impact of its applications. In addition, the increasing worldwide interest in security makes biometrics even more valuable and desirable, from many perspectives including its theory, technologies, design methodologies, and applications. The constituencies that may benefit from this ever growing field include academia, industry, government, and the general public.

To create a biometric system various issues need to be studied in a comprehensive and integrated way: from sensing to measurement procedures, from signal analysis and interpretation to quality assessment, from feature extraction to classification and analysis, from knowledge creation to extraction, and much more. Integration and cooperative combination are other key aspects of biometrics applications.

This special issue is focused on publishing original papers that address instrumentation and measurement aspects of the design, implementation and applications of biometrics. The detailed call for papers is available at <http://www.dti.unimi.it/~piuri/pages/TIM-SpecialIssueBiometricIMCFP.pdf>

The submission period is February 15 – March 1, 2009. Notification of final acceptance is expected by June 30, 2009 and publication in December 2009.

Guest Editors of this special issue are: Fabio Scotti, University of Milan, Italy; David Zhang, The Hong Kong Polytechnic University, Hong Kong; Evangelia Micheli-Tzanakou, Rutgers University, USA

Questions about the special issue should be directed to Dr. Fabio Scotti (fabio.scotti@unimi.it).

The 54th Reliability & Maintainability Symposium, RAMS♦ 2008, was held in Las Vegas at the Palace Station Resort and Casino in Las Vegas January 28 through 31.♦ The theme of this year♦s Symposium was **Dawn to Dusk ♦ Life Cycle Prescriptions** and featured 20 tutorials, 22 paper sessions representing 100+ technical papers, as well as four panels.♦ Twenty-one exhibitors made for a crowded but informative Exhibit Hall.♦ The Symposium was very successful with 703 attendees, including 94 IEEE members, from 33 countries supporting the theory that Las Vegas can be a very attractive venue for technical conferences.♦♦ Although not posted as of this writing the papers will be available IEEE Explore in the near future.♦ The 2009 RAMS♦ will be held in Ft Worth, January 26 to 29, 2009 with the theme of **Reliability as a Competitive Advantage ♦ From Theory to Practice.**♦ Information on the 2009 RAMS♦ can be found at www.rams.org along with the Call for Papers.♦ Submissions are due April 21.



Dear Colleague,



You are receiving this email because of your membership in a society which participates in the IEEE Nanotechnology Council.



We have a very strong technical program emerging this year, with several new topic areas such as Education and Environmental Health and Safety. Our confirmed plenary and luncheon speakers include such distinguished speakers as Stanley Williams from Hewlett-Packard and Michael Simpson from Oak Ridge National Laboratory. Outstanding researchers from companies like Zyxvex and Lockheed Martin, along with our colleagues from universities and government agencies, are actively participating in organizing the technical tracks. It promises to be a most engaging and worthwhile conference.



8th IEEE International Conference on Nanotechnology

August 18-21, 2008

Sheraton Hotel and Arlington Convention Center

Arlington, Texas, USA