

JUNE 2009

GOLDRush

The quarterly newsletter of IEEE GOLD for young professionals



Celebrating 125 Years
of Engineering the Future



IEEE 125th Anniversary Edition

MESSAGE FROM ADRIAN PAIS 2009 MGA GOLD Committee Chair

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Dear IEEE GOLD members, In an article entitled [“Volunteers Are the Greatest”](#), published in the June 2009 edition of *The Institute*, IEEE President John Vig mentions that without volunteers, IEEE could **not** be the “leading professional association for the advancement of technology.” A back-of-the-envelope calculation revealed to him that there are **hundreds of thousands of volunteers** contributing to the IEEE each year. This is absolutely incredible!

John Vig also pointed out the importance of finding meaningful ways to involve young professionals in IEEE and the fundamental role that GOLD has in achieving this. There is certainly no lack of

recognition from the IEEE President and other senior IEEE leaders that GOLD is essential to IEEE and the profession.

I am privileged to be part of the IEEE and to have the opportunity to work with so many great volunteers from around the world. In mid-May 2009, the GOLD Committee had its two-day annual meeting in New Jersey, USA. In attendance were GOLD representatives from various Regions and Societies, as well as GOLD representatives on IEEE Major Boards and Committees, IEEE staff members, and senior volunteers.



MGA GOLD Committee at the 2009 GOLD Annual Meeting in New Jersey

The purpose of the meeting was to begin work on a 3-to-5 year strategic plan for GOLD based on the fundamental premise that it is only through involvement and participation from all stakeholders that the plan will be fulfilled. We also worked towards some immediate objectives discussed in the [March 2009 edition](#) of *GOLDRush*. These include finding ways to feed young professional leaders to various IEEE entities and developing training manuals for GOLD volunteers at every level of the IEEE. The progress and outcomes of this ongoing work, including a renewed vision and mission of GOLD, will be reported on in the next edition of *GOLDRush*.

I was inspired by the tireless commitment, hard work and enthusiasm of all those who attended the meeting. I am encouraged and motivated by the work of thousands of GOLD volunteers throughout the world, including those contributing to GOLD Affinity Groups, those involved in regional and technical entities, and those sitting on Major

'We will continue to develop programs and opportunities that inspire, empower and engage you, our valued GOLD members, to envision and realize your dreams'

Boards and Committees of the IEEE. All of you are indeed the greatest!

We recognise that it is crucial that young professionals find a home within the IEEE, especially those who have recently graduated. Relevant activities and programs that inspire the involvement of young professionals within Societies are extremely important. The GOLD Committee is seeking closer cooperation with the Technical Activities Board (TAB) and Societies, greater engagement of

GOLD volunteers within Societies, and expansion of programs and opportunities for young professionals in Societies. I have therefore appointed William Sommerville (GOLD representative on the Vehicular Technology Society) to oversee the creation of a sustainable platform to support GOLD volunteers on Societies, thus enabling more member opportunities and engagement.

On behalf of the GOLD Committee, I pledge that we will continue to develop programs and opportunities that inspire, empower and engage you, our valued GOLD members, to envision and realize your dreams. We will continue to foster relationships and support within and outside the IEEE that enable greater cooperation and increased contributions to humanity and society. I welcome your feedback or contributions by e-mail: a.pais@ieee.org.

Best wishes,
Adrian Pais
2009 MGA GOLD Committee Chair

125 YEARS YOUNG

The young professional in 1884 By George Gordon, Editor

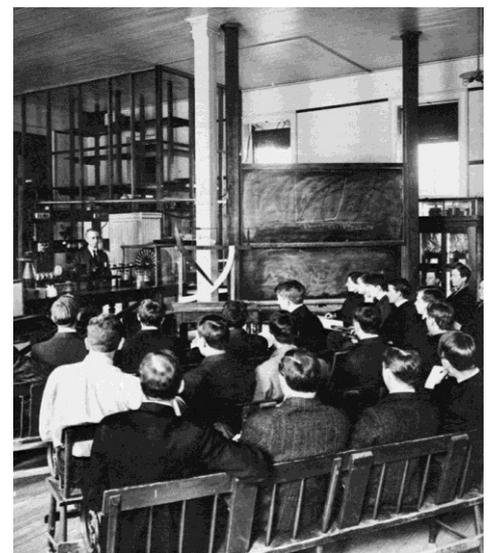
Forget your emails. Forget your cell phone. Forget the internet, your computer and even your television. It may seem inconceivable today but this was life for the pioneers of our profession over 100 years ago. In light of the 125th anniversary of IEEE, formed in 1884 as the American Institute of Electrical Engineers (AIEE), let us take a moment to ponder what it would have been like to be a young technology professional before the turn of the 20th century.

The 1880s were exciting times for Electrical Engineering, the predecessor to many of the IEEE fields of interest today. The telephone industry was burgeoning having been jumpstarted by Alexander Graham Bell in 1877. Edison had just patented his version of the electric filament light bulb and in 1882 he

switched on the world's first real consumer power station [1]. The electrical industry was booming and so it was no surprise that universities began offering courses to train young people for a career in this profession.

Education

The Darmstadt University of Technology started the first faculty and study course in Electrical Engineering in 1882, followed by the Massachusetts Institute of Technology (MIT) in the same year and Cornell University in 1883 [2]. Many of these programmes included relatively little electrical content and contained considerable amounts of humanities and social sciences. In fact at MIT it was compulsory to study German, as this was the lingua franca for much Electrical Engineering



An Electrical Engineering class at Cornell in the late 19th Century [3]

literature of the day [3]. Courses you might expect to take included “Communication Systems”, “Batteries”, “Electrical Railways” and “Illumination”.

Graduate study in Electrical Engineering was virtually unheard of as it was believed much more important to gain practical experience at the earliest possible stage. Practical experience was so highly valued that many employers believed a Master’s year to be a year wasted [4].

Work

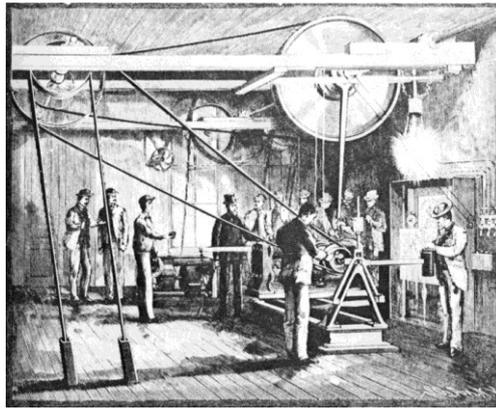
Having completed your studies, where might you find employment as a young technology professional in 1884? Just like today, there existed a number of graduate programmes designed to induct students into companies. Most notable were those at General Electric and Westinghouse Electric, which were seen as highly desirable career stepping stones [3]. A typical starting salary for a graduate electrical engineer would have been about US\$550 per year, about US\$40-50,000 in today’s money [5][6].

Those with entrepreneurial inclinations might even start their own business. In 1887, at just 27 years old Frank Sprague, an engineering graduate, began one of the first truly successful electric street car companies in Richmond, VA. The company was soon bought out by Thomas Edison [3].

There were even opportunities for aspiring computer engineers, although modern computers would not exist until many years later. In 1886 Herman Hollerith, a US gov-

ernment statistician, devised a primitive mechanical computer to keep track of medical statistics using hole-punched cards. Hollerith soon formed the Tabulating Machine Company, which would later become International Business Machines, or IBM.

There was a great deal of opportunity for



Research and Development in 1885: Testing a dynamo in the lab [5]

young technology professionals in 1884, just as there is today. However, just as today, it was the combination of these opportunities with youthful exuberance that was the key to advancing the engineering profession into the future. This concept was perhaps best put by AIEE President Prof. E. J. Houston in 1894 [3]:

“There must be something in electricity, though what it is I would not venture to say, which attracts the younger and more vigorous members of our race to its study. Perchance it may be that in this mysterious force, there

exists some lingering traces of the long sought for “fountain of youth”, but be what it may, I find in the fact that some comparatively young men have been able to do so much for the world’s weal in a special science, a bright promise of what they may be able to accomplish before their tasks are done.”

The future is in the hands of young professionals, and it looks as bright today as it did in 1884. Let us work and live so that the very same thing might be said 125 years from now.

References

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[3] Ryder, J. D. and Fink, D. G. (1984) *Engineers and Electrons: A Century of Electrical Progress*. IEEE Press, New York.

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[5] The University of Kentucky College of Engineering, *History of the College*. Retrieved 1 June 2009 from <http://www.engr.uky.edu/general/history.html>

[6] Measuring Worth - Relative Value of US Dollars. Retrieved 5 June 2009 from <http://www.measuringworth.com>

myIEEE is Looking for Your Feedback

In March 2009 myIEEE 1.7, the personalized web portal for IEEE members, was released showcasing a sleek new interface and user friendly design. This enhancement is the first in a series of changes initiated to extend and evolve myIEEE’s feature functionality.

IEEE GOLD Members are invited to complete a short feedback form so that we



may better evaluate the new design and navigation. Your comments and suggestions will help us to make improvements to further meet your needs. The first 125 GOLD Mem-

bers to respond before 31 July 2009 will receive a FREE gift courtesy of myIEEE.

To complete the form, log-in to myIEEE, www.ieee.org/myieee and select the “myIEEE Feedback” link on the bottom of the page. Be sure to include your email address so that we may identify you as a GOLD member.

READER'S FORUM

Your questions and opinions

Making It as a Consultant

The republished article, "Making It as a Consultant", by John R. Platt, was of great interest to me when I first read it in *The Institute*. I do wonder though how recent that article is, the reason being that it refers to a book called "Spare Room Tycoon", printed in 2000. This does not make it that old per se, but since I found the article quite interesting I decided to purchase this book. At that point I noticed that this book seems to be somewhat outdated, as there was no place I could find that still offered a new copy. References are useful, but if people wish to purchase them and they are not available, that is clearly not so useful. Though my search for this book is not over yet, it might be helpful if the article author could refer to some other material that is still obtainable.

WIM J. C. MELIS

The author responds: James Chan's "Spare Room Tycoon" is still available from the publisher or directly from the author at <http://www.spareroomtycoon.com/orderautographedbooks.html>. You can also read several chapters of his book on his site for free. Chan is still an active consultant and frequently speaks about consulting, so his

advice is still quite current, and well worth reading!

SoutheastCon

It was an honor to have my papers accepted at both the 2008 and 2009 IEEE SoutheastCon conferences. SoutheastCon is the annual IEEE Region 3 technical, professional, and student conference. It brings together faculty and students in the field of electrical and computer engineering to share the latest information through technical sessions, seminars, and exhibits. Conferences like this also provide great opportunities for students to meet outside the classroom.

Both events provided an excellent opportunity for me to meet GOLD members and chairs from other sections and regions. At this year's conference I met Wah Garris who introduced me to IEEE GOLD and invited me to get involved in the MGA GOLD Committee. This opportunity has opened the door for me to work together with other MGA members to plan and implement future

events and activities. I also enjoyed viewing the exhibits and talking with company representatives about the technology they use and training they provide.

SoutheastCon is one of the best conferences I have attended. I look forward to attending the conference again next year and meeting more GOLD members!

SIMON OBEID



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Express your opinions on GOLDRush articles and ask questions to the authors by submitting a letter to the GOLDRush reader's forum. Send your submissions to GOLDRush@ieee.org before 5 August 2009 for inclusion in the September edition. Submissions must be no more than 200 words and may be edited if necessary. We look forward to hearing your thoughts!

Photos: IEEE 125th Anniversary Awards Night in Virginia

The Northern Virginia and Washington Sections recently held their annual awards banquet. The event formed part of their celebrations of the 125th Anniversary of IEEE and featured guest speakers Dr. Charles Alexander, 1997 President of IEEE, his colleague Mr. James Watson and Dr. Frederica Darema of the National Science Foundation.



Photos by Michael Pearse

INVITED ARTICLE

The Waffle Chronicles: English – What they don't teach you at University

By Loreen Ozolins
(IEEE Senior Member)

"You have to dieter (pronounced deeter) mine the NPV through good solid analysis before you can ass ass the results and make your conclusions"

Now, I am not Winston Churchill when it comes to having a command of the English language but my mental databanks from my recall of both

to have several extremely interesting engineering jobs that have led me all over the world. With each new chapter, in each new company, in each new country I began, rather humorously, to realize that my grasp on the English language, as well as my listening skills, were hopelessly inadequate and in need of some significant upgrading.

Nothing prepared me for the next assignment when I was hired to manage a very big programme for Singapore Airlines during the turn of this Century.

During my first meeting with a cast of no less than 30 people, I was surprised when the meeting finally started. It was a very formal affair held just before lunch – a known technique used in this part of the world if you want your meetings to end on time! The meeting starting 30 minutes late because the highest ranking person, the Technical Director had yet to show up – making the meeting even more efficient than usual.

The moment he arrived, the conversation

Hmmm....tricky question.

My split second recall of the Oxford/Webster data bank was drawing a blank on the word, "lestolon".

"Caaannnnnnn?????" was my response not wanting to disagree with anything on my first day on the job but still not knowing exactly what it was I was agreeing to!. We then got up and went to a local res-tau-rant (les-to-lon) for lunch!

It was at that time that I began to really admire countries that have encouraged and integrated the teaching of several languages into their teaching curriculum. I have worked in the USA, the UK, New Zealand, Belgium, Germany, The Netherlands, Sweden, Denmark, Italy, Singapore, Hong Kong, the Czech Republic, China and India. With the exception of the first three countries, the school curriculums all included learning at least 1 other language starting from a very early age.

It is my opinion that people that can speak multiple languages, no matter which

"You have to dieter (pronounced deeter) mine the NPV through good solid analysis before you can ass ass the results and make your conclusions"

the Oxford and Webster dictionaries came up blank on the word "dieter mine" much less "ass ass" – other than of course the obvious meaning.

Perhaps "Dieter mine" is a new data mining technique to come out of one of the Big 5 Consulting firms? After all, one cannot possibly keep up with all of the new management techniques these days. As for the "ass ass", well, that had me completely baffled.

Finally, sometime later in the meeting, the penny dropped as my ear adjusted to the different emphasis on the syllables:

"You have to DETERMINE the NPV through good solid analysis before you can ASSESS the outcome."

I have been really fortunate in my career

was quick and fast in a lyric I didn't recognize. This went on for 30 minutes or so as I watched the faces of the people with interest listening to the dynamic sing-song of the conversation, wondering exactly what they were talking about. I was just pondering the delightful sounds of the language when the room fell silent with everyone looking at me as the Technical Director of the Programme asked,

"Do you understand? We try to speak very good English for you!"

I was still pondering how I could have mistaken English for Chinese when the Technical Director then looked at his watch and asked me, "Lestolon? Can or can not, lab?!"



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languages they are, already have more opportunities open to them than those that only speak English. I also firmly believe that this trend of rewarding multi-linguistic Engineering professionals will continue to grow and be a key skill set for our engineering profession as the world continues to become more and more integrated through the technology that we invent.

No truer a word is spoken in jest when working in Belgium, where there are no less than 3 official languages, none of them English. Flemish, French and German are the official languages but many people also speak English as well. It has been working in Belgium that has raised my understanding of the flexibility of the English language to a whole new level.

"Lets go and take a Coffee?", my colleague said.

My immediate thoughts were, "I don't want to steal any coffee!"

"Come, we take a coffee". Oh, great I thought, I will be wanted by Interpol for stealing coffee! I already had a \$200 offense for inadvertently trying to smuggle a single banana into New Zealand and I didn't want to be known in Belgium as the "coffee thief"!

But alas, I quietly followed my new partner in crime to the place where this offense was to be committed all the while thinking how I could escape this dastardly deed of taking coffee. When we arrived at the kitchen he proceeded to get out 2 cups and pour us a both a coffee.

Ah! "Take" = "Have". We were not going to "take" any coffee but "have" a coffee together! Brilliant!

Things were going along swimmingly when my Australian friend received an invitation from work:

"After the meeting you are invited to join us for a walking dinner"

In typical Aussie language, she asked, *"What the %\$# is a 'walking dinner'? Does your plate get up and walk off the table?"*

The answer to the mysterious "walking dinner" question was resolved when she arrived to find the evening was "buffet" style where you help yourself to food, stand around high tables whilst eating and chatting the

entire evening: A proverbial "Walking Dinner" indeed!!

I have been trying to learn French for a few years now. So my appreciation for people who have mastered another language increased tremendously when I recently went on holiday to France wanting to try out my French.

Having just sat down to dinner in a very crowded "lestone", the waitress put a plate of succulent lamb chops in front of me. In my best French accent, I blurted out at the exact time the entire place fell silent:

"I have a vegetarian!"

She looked at me, smiled, then asked, *"Where?"*

'If you can effectively communicate in another language your worth to your organization and your own professional and personal development increases'

As our world continues to shrink through our inventions of technology, transportation and commerce, so will our cultures. Embrace this "culture clash"! Learn a foreign language. And if you already have learned 1, then learn another one.

If you can effectively communicate in another language your worth to your organization and your own professional and personal development increases: you can learn so much about different countries and their cultures through learning their language. It may not always be perfect, but the effort you make in trying to communicate in another language will gain you immediate respect if not a laugh or two!

There is another benefit as well. Through learning a new language you also learn to listen and listen well. Listening is an invaluable skill when working in different foreign lands as it increases your awareness of the differences and also the similarities hence



Loreen Ozolins has over 20 years of Project and Programme Management experience in a variety of industries. She has worked on several high tech projects including engine management systems for King of the Hill Corvettes, automation of paper machines and gas pipelines for forestry, telecommunications in the "Space Race" and managing large IT infrastructure Programmes for Singapore Airlines and DBS Bank in Hong Kong. She now designs and conducts project management workshops in Europe and Asia for world leading organizations in lithography, packaging, dairy, banking and electricity. Loreen is an IEEE Senior Member and has been actively involved in a variety of positions since 1984 when her first position was as the University of Colorado at Colorado Springs Student Branch Chair.

making it perhaps just a bit easier to understand the people, the place and the meaning of what you are trying to convey.

As I travel the world on my working adventures, I have come across many linguistic adventures! As I share these humorous adventures with you, my colleagues, I find that I am not alone in these faux pas of hilarity. So, if you would like to add your humorous adventures to the Waffle Chronicles, please send them to GOLDRush@ieee.org, subject: Waffle Chronicles

Waffle On, Friends!

**Comments on this article?
Write to our Reader's Forum at
GOLDRush@ieee.org**

MEMBER PROFILE

Every issue, we profile a GOLD member in the workforce. This issue's profile looks at:



Rainer Spiegel

IEEE Student Member, Munich, Germany

Career description:

After psychology education in Switzerland/Germany (the equivalent of Bachelor/Master), I did my PhD at the Department of Experimental Psychology, University of Cambridge (UK). My thesis title was Human and Machine Learning of Spatio-Temporal Sequences: An Experimental and Computational Investigation. Subsequently, I became a Junior Research Fellow in Experimental Psychology at

Wolfson College (University of Cambridge) and received a junior faculty position in Computer Science at Goldsmiths College (University of London). After being on the faculty for two years, however, I decided to go back into education to study medicine at Ludwig-Maximilians-University in Munich (Germany). I am now in my final stages at medical school, where I am involved in research projects on vertigo, balance and sensory-motor processes. I did clinical experiences in Internal Medicine (Rheumatology), Neurology, Ophthalmology and Psychiatry.

I was interested in both people and technical devices as much I was interested in treating diseases and conducting research projects. I aim to specialize in the field of neurology, which partially overlaps with methods from experimental psychology and neurocomputing. It is my aim to help alleviate neurological symptoms (e.g. vertigo, sensory-motor problems etc.).

Personal interests:

I very much enjoy BMX-freestyle (see Part-time passions, IEEE The Institute, September 2008), snowboarding, going to the movies, travelling and learning languages (currently trying to improve my Portuguese).

How has IEEE shaped your career?:

I became an IEEE student mem-

ber after I had seen an IEEE membership advert in the library where I was looking at IEEE Transactions articles. As a student member I played a small part in the voluntary creation of an online system that confirmed the student status, so that students from Cambridge University could have their student status confirmed electronically when applying to become IEEE members. Throughout my studies, I very much enjoyed going to IEEE conferences (International Joint Conference on Neural Networks, IEEE International Conference on Fuzzy Systems, IEEE World Congress on Computational Intelligence), where IEEE provided student grants.

Words of advice for young professionals:

I believe you should try to live your dreams, although I acknowledge that there can be a lot of external barriers that might hinder you in doing so. Even if your dreams are realistic, it may often take a lot of extra time, patience and could even require a number of detours. In any case, it is important to find out for yourself what you really enjoy doing and to permit changes in case your goals and dreams change. If you are sure what you want to do, stay focused, and don't be put off by the detours you may need to take.

GOLD NEWS

From around the world

Join the IEEE's 125th Anniversary Virtual GOLD Event

By João Figueiras
(Region 8 GOLD Coordinator)

In 2009, IEEE will celebrate 125 Years of Engineering the Future with a year-long celebration around the globe. IEEE GOLD has started its own virtual 125th Anniversary event by inviting members

and non-members to create short video clips that will be connected to form a fun anniversary video with worldwide participation.

The concept is simple – GOLD members are encouraged to visit the Web site at <http://www.goldaroundtheworld.com/>, view the video, download and print out a copy of the IEEE's 125th Anniversary mark, and create their own video clip, maximum 10 seconds long, where it appears as if they are passing along the Anniversary mark from person to person, and from place to place. Volunteers at Region 8 GOLD Committee, who conceived the project, are maintaining the website

and connecting the short clips to make the larger video.

The end result is a video that takes the IEEE 125th anniversary mark – and the celebration – all across the world. Guidelines and specifications for making and posting videos are found on the Web site. For general information on the 125th Anniversary of the IEEE, visit www.ieee125.org. The event shall close on December 31st 2009 and the final cut shall be ready by the beginning of 2010. The final cut video will then be placed on YouTube, for global awareness.



IEEE GOLD Webinars – A value added extravaganza

By Megha Joshi
(GOLD Webinar Coordinator)

IEEE GOLD has recently conducted a series of webinars to help engineers navigate through a globalized and turbulent business landscape in these tough economic times. Arun Gopalakrishnan, a highly enterprising IEEE GOLD volunteer with diverse work experience from R&D to marketing, shared his views on how engineers can contribute to an organization. Arun presently works for Du Pont as a Marketing Manager and sets the global strategies in the energy segment. Three broad topics were covered in this series and the recorded versions are available online.

Seminar 1: Navigating a globalized, turbulent business landscape – what engineers need to know <http://ieeena3.acrobat.com/p70729649/>

The first webinar initially focuses on globalization and how international trade works between countries, how multinational companies make decisions that impact global supply chains, what challenges are faced by them and how they are tackled. The focus then shifts to product life cycles, product development and portfolios. The webinar also discusses tangible actions that engineers can take to increase their knowledge of business drivers and to challenge commercial managers to incorporate long-term strategies, thereby ensuring that their firms thrive for years to come.

Seminar 2: How engineers and marketers work together to create new products in innovative companies <http://ieeena3.acrobat.com/p15405520/>

The second webinar narrows down to the product development and commercialization process, which comes together from a cross-functional perspective. This webinar covers topics such as best-in-class product develop-

ment processes, identifying true unmet customer needs with high value potential and how to foster cross-functional collaboration between technical and marketing professionals. The webinar also discusses actions that engineers can take to ensure that their technical projects and efforts lead to high probability wins in the marketplace.

Seminar 3: Career change: how engineers can contribute in a business/commercial role for a technology company

The third and final webinar in the series discusses career change, the importance of a career plan (both short and long term) and networking. People with engineering experience who also develop business skills can play key roles in technology companies where such a combination of skills is particularly valuable. This webinar discusses how to make this transition and the type of opportunities available for those who move from engineering to commercial roles. The webinar also touches on the actions that engineers can take to differentiate themselves and increase their portability across industries in today's turbulent economic conditions.

The three webinars are loaded with rich content and real life paradigms that make it a GOLDen delight for all young IEEE professionals.

IEEE Anniversary Celebration in Spain

By Antonio Luque

A celebration of IEEE's 125th anniversary is being prepared in Spain, and several GOLD members are in the organizing committee. The event will take place in the city of Seville, on June 10th, and will consist of a number of different activities. A presentation on the Spain Section and of its more than 40 years of history will be delivered by the Section's President and Past-President. After that another presentation will deal with the history of engineering and technology and the engineering creation method using the

development of wireless communications from Maxwell to Hertz and Marconi as a prototypical example. At the same time, an exhibition will showcase some of the pivotal developments in electrical and electronics engineering featuring several unique objects, some of which are more than 100 years old. The event will end with a social function, where people can meet one another while enjoying meals and drinks. Everybody is invited to participate so come and join us in Seville on June 10th! For more information, visit ieeegold.org/spain or email aluque@ieeegold.org.



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GOLD Congress in Bangalore

As part of the IEEE's 125th anniversary celebrations, a GOLD congress is being planned in Bangalore, India, on 5th and 6th December. The theme of the event is "Challenges for young professionals and next generation leaders" - to celebrate IEEE's proud history of success, as well as identify and groom the next generation of future leaders to sustain this legacy.

It is anticipated that most of the participants will be GOLD members and students from India and nearby countries, but the organisers will more than welcome participants from other corners of R10 or even outside of R10.

More details about this event and invitations to participate will be publicised very soon. Expressions of interest should be sent to r10gold@ieeegold.org or ieeegold.blr@gmail.com.

**Comments on GOLD News?
Write to our Reader's Forum at
GOLDRush@ieeegold.org**

A Peek Inside the IEEE Operations Center

By Aisha Yousuf
(Region 4 GOLD Coordinator)

The annual IEEE MGA GOLD Committee meeting was held in Piscataway, New Jersey, USA on 15 – 16 May, 2009. As part of this meeting, the GOLD volunteers got to visit the IEEE Operations Center in New Jersey. The idea behind the tour of the operations center was to learn more about IEEE operations and meet IEEE staff and other MGA volunteers.

The IEEE Operations Center consists of three buildings with over 700 staff members working at the facility. Quite contrary to what people might expect, the IEEE Operations Center is a very secure building. Upon arrival at the facility, all the GOLD Committee members had to be checked in and photographed in the lobby, where all the medals and awards of IEEE were displayed proudly along with photos of some recent events and Mission and Vision of IEEE.

Walking through the hallways was like witnessing the history of engineering. The entire building was a tribute to engineering and the dedication of IEEE to advancement of technology. The white corridors of IEEE

buildings were lined with black and white frames displaying photographs of famous inventors, patents, historic events, equations and proofs, and awards. Every once in a while around the corner would be a small exhibit of life-changing technologies or busts of famous inventors.

The first stop on our tour was the IEEE contact center. The IEEE contact center, with two shifts of multilingual staff is open 120+ hours per week with an average response time to members' questions through e-mail of about 1 to 2 days. The contact center, along with other units of IEEE, also has an emergency plan. That is, in case the building needs to shut down, the staff members can continue their work from home or off site to maintain the good quality of the service for the IEEE members. More information about the IEEE contact center is available at: www.ieee.org/contactcenter.



The hallways of the operations center are like a museum of engineering.

The next stop on the tour was the IEEE command center. Sadly no picture taking was allowed in this facility and very few people have permission to enter it. The main room of the command center was like the inside of a space craft in a sci-fi movie. The command center had a huge desk lined with computers and two whole walls lined with TVs and monitors along with wall clocks on the opposite wall displaying time in various parts of the world. These computers monitor every activity on IEEE servers as well as building security. In addition a TV screen is tuned to world news 24-7 to watch for any natural disasters, emergencies or technology news stories that might affect IEEE in any way or



The lobby of the IEEE Operations Center in Piscataway, NJ, USA.



The IEEE TV studio.

disrupt operations. Also inside the command center is a server room where rows upon rows of servers are housed, along with over 80 air conditioners to keep them cool. These servers hold the 1.1 million documents in the IEEE Xplore digital library, IEEE webpages, member information, which requires the most security, and much more. Of course, the server room comes with its own automatic backup tape sorting robot! Clearly, IEEE firmly believes in utilizing the advanced technology it promotes.

The last stop on the tour was the IEEE.tv production room. Here we were able to gain a sneak peak into the latest production for the series 'Profiles in Volunteering'. This series sheds light on outstanding engineers who use their technical skills to help others in need and benefit humanity. The latest episode featured GOLD member Sampathkumar Veeraraghavan and can be viewed online at iecc.tv.

Overall the tour was very educational and many of the GOLD Committee members were pleasantly surprised by IEEE's exceptional dedication to its members. IEEE always welcomes visits from its members so if you would like to see the operations center for yourself, don't hesitate to call IEEE and make an appointment.

News from IEEE Morocco GOLD Affinity Group

By Hasnae Melhaoui & Imade Benelallam

It is our pleasure to announce that thanks to the efforts of several IEEE student members, the IEEE Morocco GOLD Affinity Group (AG) has officially been formed. We celebrated the inaugural meeting at the University of Mohammed the Fifth Agdal on October 23, 2009. Led by Imade Benelallam, Chair, the main mission of the IEEE Morocco GOLD AG is to promote strategies to facilitate the transition of student

members to higher grades, and to provide recent engineering graduates with a collaborative network. The IEEE Morocco GOLD AG aims to foster the participation of young professionals in IEEE events and provide them with opportunities to develop professionally and personally. It also seeks to become a bridge between young and senior members.

On November 3 and 4, LIMIARF Laboratory, the Association of Information Technologies Researchers (ACTIF, "Association des Chercheurs en Technologies de l'Information" in French), and the IEEE Morocco

GOLD AG successfully organized JOS-TIC'08, a scientific conference being held for the second time (<http://www.fsr.ac.ma/jostic/>). PhD students from several Moroccan universities, ACTIF members, and IEEE Moroccan GOLDies attended the conference, whose main aim was to showcase the development of scientific and technological research in Morocco to the scientific and professional community. This event also provided a good opportunity for university researchers and professionals to exchange experiences.

IEEE NZ North GOLD Induction Dinner

By Pradeep Anasuri
(IEEE New Zealand North Section GOLD Chair)

On May 11 2009 the IEEE New Zealand North Section GOLD Affinity Group held its first event of the year: a GOLD induction dinner. Invited were both current GOLD members and guests interested in becoming members. The affinity group holds regular events throughout the year including site visits to the Auckland Sky Tower, Lion Nathan Brewery and the Auckland Traffic Control Centre as well as workshops on topics such as time management, leadership and career development. A list of past events can be found at http://www.ieeenorth.org.nz/gold/?page=past_events. This year the focus will be geared towards social events where members can network with one another and with distinguished guests from relevant fields. This GOLD affinity group exists to help

students make the move from an academic environment to a professional one. It aims to aid members' professional development by offering training in leadership and time man-



GOLD members and potential members at the induction dinner.

agement and providing mentoring. Finally, it seeks to provide mechanisms for graduates to network with people of similar ages from a wide variety of career paths.

**Comments on GOLD News?
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SIBCON2009: IEEE GOLD Italy and IEEE GOLD Siberia together for the first time

By Cosimo Stallo
(IEEE Italy GOLD Chair)

The 8th Siberian Conference on Control and Communications (SIBCON) was held in Tomsk, Russia on 27-28 March, 2009. The meeting, which takes place every other year, was sponsored by the Russian Foundation for Basic Research with technical co-sponsorship from the Russia Siberia Section. It was organized by the Tomsk Electromagnetic Compatibility Society Chapter and the Siberian GOLD Affinity Group, chaired by Oleg Stukach.

The technical program was divided into several oral sessions on contributed papers. Conference attendees discussed many papers on a wide range of scientific topics. The main aim of the conference was to bring together researchers from various fields in order to present advances in state-of-art theory and



GOLD Members sightseeing in Tomsk in Siberia, Russia

technology in communications and control. The intended result was to develop unified perspectives in this interdisciplinary field of advanced research.

Many participants also showed interest in sharing experiences and opinions from a cultural and historical perspective, which proved particularly rewarding for everyone. This brought additional value to the conference and made it truly memorable. Tomsk is one of the oldest towns in Siberia and has always

played a very important role in both the scientific and the cultural life of Russia. The participants at the conference had the opportunity to enjoy Tomsk's historical sites, museums and the Voskresenskaya Mountain, where a stone monument to the city's foundation stands. The conference banquet was held in the "Scientific Palace", located in the historical part of the town.

SIBCON was a great opportunity to create a bridge between experienced IEEE members and newcomers. It also provided an excellent starting point for innovative business ventures and strong relationships between the Italian and Siberian GOLD Affinity Groups. We hope you might consider participating at the next SIBCON which will be held in Krasnoyarsk, Russia, in 2011: you will not be disappointed.

Further information about SIBCON can be found at <http://www.comsoc.org/tomsk/sibcon/>



Panel discussion session at SIBCON2009.

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PEER-REVIEWED CONTRIBUTIONS

Why and How is GOLD Different?

By Vijay Ramnath Jayaraman
(IEEE Member)

I recently renewed my IEEE membership and I realized that I belong to the Region 3 and the Atlanta Section. I had been thinking of renewing for a long time after a big gap from my undergrad studies. A friend of mine who is an active volunteer for the GOLD Affinity Group in Texas insisted that I take up some volunteering positions with the section. I was considering joining a few specific groups like Engineering Management, Engineering in Medicine and Biology etc but then after a long thought process I finally decided upon GOLD. I have decided to share this thought process because I became totally convinced that there is no better stage to display management and leadership skills than GOLD.

GOLD is very unique. I say this with certainty because I am also a part of a couple of other professional bodies like IIE, HIMSS and the SHS. All of these are very credible and extremely popular bodies like the IEEE in their own fields. However, after looking into their membership details and the kind of volunteering opportunities that one might get, I was surprised to find that there is no comparative group like what IEEE has by the name of GOLD. GOLD cuts across all area specific groups in IEEE and thus could be

used as a stepping stone for entering into leadership roles in those groups.

I recently went through the list of issues that most IEEE leaders are concerned about. They talk about increasing memberships at the grass-roots level and beginning with the students. IEEE has been very successful in targeting students. There are already hundreds of members in all the schools I have been into. What IEEE needs to focus on is converting these student members into full members. The only answer to that is GOLD. The success or the failure of a GOLD group could be measured by this conversion rate. There are many reasons that could explain this drop in membership, not the least of which is popularity.

'I became totally convinced that there is no better stage to display management and leadership skills than GOLD'

As I was thinking about the ways to mobilize our GOLD Affinity Group, I had a chance to discuss them with some current GOLD members. One of key reasons for unpopularity that we uncovered in our brainstorming session was the inability to provide the current student members with the incentives. We came up with several good ideas:

- Combining student events in the section with at least one GOLD sponsored event. This will showcase the importance of GOLD and IEEE in general and also improve awareness.
- Providing student and GOLD members



Vijay Ramnath Jayaraman is the Vice-Chair of the Atlanta Section GOLD Affinity Group

with access to job fairs so that there is a big incentive for the current student members to renew their accounts even after they graduate.

- Running job training workshops and panel discussions.
- Arranging meetings for GOLD group leaders at least once a year in an "annual GOLD conference" and brainstorm ideas, similar to how groups like the Power Electronics Society and the Engineering in Medicine and Biology Society currently meet at their technical conferences. This way there is not only great visibility for GOLD, but leaders are offered a chance to talk to other GOLD leaders to discuss the challenges they face and share ideas to solve them.

I am looking forward to hear from the current members and I am very interested in what they think about these ideas. Please email any comments and discussions on these topics to vijay.j@ieee.org.

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Graduates Of the Last Decade

Global Security Concerns: Moving Towards a Foolproof Authentication System Using Brain Signals

By Cota Navin Gupta
(IEEE Graduate Student Member)

Automatic verification of a user's identity has become an everyday issue. It is especially important in ensuring security for access to restricted areas such as research labs and airport control gates and involves either confirmation or denial of the user's identity. With the recent advances in technology and computing power biometric technologies using iris, fingerprint and face scanning have become increasingly popular.

Current biometric technologies are somewhat fraud resistant, but are not completely foolproof and can be compromised. While there are many public identity databases containing biometric fingerprint data, fingerprint biometric systems are not suitable for high security environments. Recent studies have shown that common household articles, such as gelatin, can be used to make artificial fingerprints to bypass security systems. Face recognition has been used as a biometric system but issues like family resemblance, occurrence of identical twins (one in every 10,000) bring into question their reliability. Further, it has been shown that face recognition systems can be bypassed simply by using still images and video footage of a person. Another issue facing many of the

'Biometric authentication, which arrived as early as the 19th century with the use of fingerprints, is being used today without much improvement'

biometric systems is the fact that most biometric data sources last a lifetime and if misused may permanently violate a person's privacy.

While we cannot expect any biometric to effectively meet the requirements for all applications, the above discussion highlights the shortcomings of existing techniques in high security environments and reiterates the need for an authentication system that has characteristics like changeability, privacy (theft protection), universality and stability. With the issue of terrorism raising its hood of late and global security being on every government's agenda, the research community is constantly developing new ways to combat these threats effectively.

More recently, a new authentication method using brain signals has started making waves. The breakthrough in brain-computer interface (BCI) system designs, which effectively capture brain signals for translation into control commands, has made this new method possible. The scientific community is currently exploring various effective approaches to transform this nascent research idea into an effective and reliable commercial system for high security applications. However, there are a number of hurdles in using such systems: complexity in obtaining reliable brain signals without unwieldy data collection procedures and paradigms; difficulty in extracting effective features from the brain signals; and efficient translation of these features into authentication commands.

This challenging task involves innovative and 'outside the box' interdisciplinary research at the fringes of computer science, engineering and even psychology.

The pioneering system currently under research in University of Essex exploits a novel integrated evoked potential scheme at an application level for biometric authentication. The system proposes to use evoked brain signals (recorded at certain optimal



Cota Navin Gupta is currently working towards his Ph.D. in the Brain Computer Interface labs at the University of Essex, UK.

locations on the scalp) to recognise the sequence of colours/images/letters that the user focuses on. This sequence forms a password, which we denote as the 'BrainWord'. Further, the novel paradigm developed utilizes a multi-feature strategy that enables enhanced recognition performance. With the advent of dry electrodes to obtain brain signals, a simple headband can be designed to capture the required data and the concept of 'brain biometrics' is beginning to look viable and attractive.

Looking back today, it is surprising that the field of biometric authentication, which arrived as early as the 19th century with the use of fingerprints for criminal identification, is being used today without much improvement. There is no denying the fact that biometrics, applied as a matter of principle has provided effective solutions for many applications. There is, however, an urgent need to explore novel and futuristic security technologies to combat rapidly evolving forms of identity theft and even terrorism. Imagination combined with practicality appears to be the key here. While there is still much research progress to be made on all fronts, the race is definitely heating up and we foresee the technology using brain signals moving towards the threshold of commercialisation in the coming years.

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Selecting Research Topics with Product Development in Mind

By Josh Mull
(IEEE Member)
Key Technologies Inc
Baltimore, MD USA.

Each year, companies and universities pour hundreds of millions of dollars into scientific research. And each year, a few great ideas emerge from the sea of research projects and blossom into promising technologies that will have great success in the open market. However, for every one successful technology there are many more great ideas that stagnate and are slowly forgotten. What differentiates the successful projects from those that struggle for attention is market need.

The evolution of a research project can be considered a series of unique phases. With each progressive stage, fewer projects continue down the pipeline. These phases take the forms of securing funding, completing and publishing research, refining and transitioning into product development, and being introduced to the market. For many projects, the critical point in their evolution occurs between the publishing and product development phases. This is the point in a project's evolution where market need becomes a critical consideration in the project's success.

While many research topics do a great job of advancing scientific understanding, product development is ultimately a business venture. The majority of research projects do not translate well into meeting a market need. Perhaps the right application has not been identified or the marketplace just is not ready for a new technology. For ideas struggling to graduate from the research phase into the product development phase, new realms of

considerations, such as the business model, production cost, or product yield, suddenly appear. It becomes apparent that a great deal of additional capital will be needed to invest in the refinement, production, and marketing of the project. A project is no longer judged on its technical prowess or intrigue, but rather it is considered in terms of its risk-to-reward ratio and up-front costs versus long-term return. The appeal of a well-addressed market need quickly becomes the biggest advantage that a fledging project can have.

When companies, government agencies, or venture capital firms evaluate the breadth of research published each year looking for projects to fund, they target the projects that most directly address a market need. When compared against other ideas that need further research simply to find a suitable market, it becomes an easy decision for funding groups to direct their money toward the projects with the best risk-to-reward ratios: projects that began their consideration of market need early. Projects that exhibit compelling market needs have stronger business plans, and the

technology behind them can graduate into further development. Ideas that do not attempt to address a market need, no matter how strong the science behind them, will always have an uphill battle to overcome their risk-heavy risk-to-reward ratio.

For research topics that successfully plan ahead to address a market need, there is ample opportunity for the project to receive continued funding and grow into a product with great potential. Government grants, venture capital, and corporate buyouts all provide opportunities for good ideas and good research to evolve into products that become market successes. The biggest challenge for researchers who want to see their science move beyond the lab stage is identifying

and addressing a market need early in the research, and driving their project toward that market need. Success in driving toward a market need will give any project the assets it needs to become a competitive business venture and continue down the path to successful technology development.

'The biggest challenge for researchers who want to see their science move beyond the lab stage is identifying and addressing a market need early in the research'

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Telecommunications Mythbusting

By Milan Bjelica
(IEEE Graduate Student Member)

Telecommunication technologies have inevitably become a key component of popular culture. In TV series and movies the heroes use high-end communication devices, while back in the headquarters a supercomputer searches large databases in the blink of an eye. It would seem that nowadays it is technology, rather than gray matter, that solves the most complicated crime cases.

Being a communications engineer, I often find myself asked if these scenarios are reasonable or possible. I am aware that the screenwriters are not guided by scientific principles but rather by effect on the audience instead. However, in doing this they not only promote popular misunderstandings of telecommunications and technology in general, but sometimes tend to shape them as well.

Of course, some ideas have indeed evolved from science fiction to reality, mobile phones and laptop computers being notable examples. However, when judging the plausibility of fictional gadgetry, it is necessary to distinguish between the physical and the technological aspects. The technology may well evolve through time but the fundamental laws of nature remain unchanged.

Let us consider two examples that are often seen on TV. In the first one, an action hero

communicates with mission headquarters via a satellite transponder implanted in his tooth. While this idea is not physically impossible, its implementation would call for enormous engineering effort. The complete device—battery, transmitter and antenna—must fit into the tooth cavity. This space constraint means that both the available battery power and antenna gain would be very limited at best. If we now assume that operating wavelength is comparable to the antenna size then even for the best case, i.e. transmitting to a low-orbiting satellite, it is not difficult to show that the signal would suffer enormous attenuation just traveling through free space.

In my opinion, it would be virtually impossible to make this idea a reality with present state of the art technology.

The second example makes use of something one might call the “almighty signal processing”. In numerous TV series, a blurry security camera shot is passed through image enhance-

ment software that, having magnified the picture thousands of times, extracts a crystal clear image of the suspect’s face or even fingerprints. To the average viewer this may appear scientifically founded, but it is nothing more than pure fiction. Every camera has a

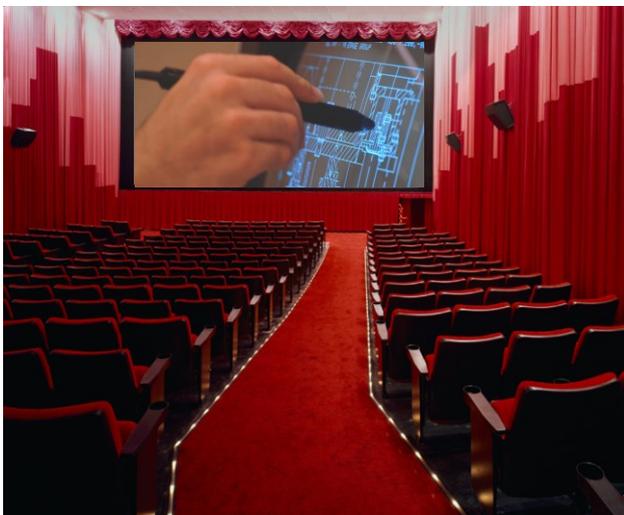
Milan Bjelica has a BS and MS in Electrical Engineering, both from School of Electrical Engineering (ETF), Belgrade, Serbia. He is currently a PhD candidate in communications at ETF.



finite (i.e. limited) resolution. If the camera had failed to capture sufficiently detailed information in the first place, then there is no image processing method could create this extra detail from nothing. In the best case, it would be possible to reveal some hidden or less obvious details. From what we often see, the input camera images are dark, noisy and blurry, with the subject of interest occupying only a small portion of the frame. In these cases it is particularly difficult to extract such important information, especially by magnification alone.

One might ask if this discussion is needed at all? Why should we not just enjoy these fanciful creations of popular culture without thinking about their basis in science? I am strongly opposed to this point of view because it could easily misrepresent the engineering profession as charlatanism. Engineers should stop being mere consumers and try to get involved in creating popular culture. The entertainment industry already utilises the services of medical and legal advisors; maybe it is high time to introduce engineering advisors as well. With a little help from the rest of the engineering community, these advisors should insist on highlighting the difference between ideas that are plausible and those that are fictional, existing only for their entertainment value. In this way the role and the importance of engineers in modern society might be better understood and appreciated.

‘The entertainment industry already utilises the services of medical and legal advisors; maybe it is high time to introduce engineering advisors as well’



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NOTICES

IEEE Launches Interactive Web Site to Highlight Members' Humanitarian Projects

IEEE has announced the new Humanitarian Technology Network (HTN) - a platform that enables IEEE members to connect and collaborate with others doing similar humanitarian work, while gaining visibility and recognition for their efforts. In addition to sharing details of their project(s), IEEE members may also post their needs for advice, funding or assistance from others. The ability to post articles in the HTN is one of the benefits of IEEE membership. Anyone can browse or view the HTN content, including humanitarians, Non-Governmental Organizations (NGOs), and others who may wish to partner with or fund member humanitarian efforts.

The HTN is built on the same technology as the IEEE Global History Network launched in 2008. The platform accommodates multi-media descriptions - including text, photographs, diagrams, audio, video, as well as PowerPoint slide presentations.

The network is now open for IEEE member contributions. Visit www.ieeehtn.org to make your humanitarian contributions more visible.

IEEE in Second Life

Second Life® is an online 3-D virtual world within which residents are able to establish identities (avatars), explore, create and communicate. Referred to as "inworld" by its residents, this interactive environment lends itself well to social networking, collaboration and learning. IEEE

has created in Second Life® a virtual infrastructure and presence to support its staff, volunteer and member needs. This presence is spread across two islands and serves as a gateway for people to explore and participate in the activities of the IEEE. Opportunities to help develop the IEEE islands are open to IEEE staff, volunteer and member groups. To view the IEEE in the Virtual World visit <http://www.ieee.org/go/secondlife>. If you'd like to participate, please contact the IEEE Second Life Team. Send an email to secondlife@ieee.org expressing interest to become involved.

IEEE Electron Devices Society Early Career Award

Cor L. Claeys
(IEEE Electron Devices Society President)

The IEEE Electron Devices Society (EDS) is very happy to announce a new award, the EDS Early Career Award. This award will promote, recognize and support Early Career Technical Development within the IEEE Electron Devices Society field of interest. The candidate must be an IEEE EDS Graduate of the Last Decade (GOLD) member at the time of nomination and the nominator must be an IEEE EDS member. This award will be presented annually at the annual GOLD Lecture held in conjunction with the International Electron Devices Meeting (IEDM). The recipient will receive a certificate and a check for \$1,000. Further details concerning the award can be found on the EDS website at http://www.ieee.org/portal/pages/society/eds/awards/early_career_award.html

All nominations should be sent to Fran Urbaniak of the EDS Executive Office (frurbaniak@ieee.org). The deadline for submission of nominations for the 2009 award is 15 August 2009.

Call for Articles: September Edition

IEEE GOLDRush invites you to submit an article for publication in the September 2009 edition. The article topic(s) shall be of interest to young professionals, the primary readers of the publication. Articles must be strictly no more than 700 words and should be sent to the IEEE GOLDRush editor, George Gordon, at GOLDRush@ieee.org on or before 5 August, 2009. Please feel free to include captioned photos or pictures with your submission. All articles and photo(s) will be peer reviewed and edited if necessary. Full submission guidelines must be adhered to and can be found at <http://www.ieee.org/web/membership/gold/newsletter/goldrushPolicy.html>.

We look forward to reading your articles!

Articles of Interest from The Institute

Adrian Pais: The GOLD Standard
By Susan Karlin - <http://is.gd/JDXg>

IEEE-USA Survey Taps Strategies for Surviving Unemployment By John R. Platt - <http://is.gd/N4DS>

IEEE: No Better Place for Networking
BY Kathy Kowalenko - <http://is.gd/N4Kx>

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