



## Message from Chairman

August, 2011..

Dear Members,

Greetings from IEEE INDIA COUNCIL, during the last month, IEEE India Council have been recognized as emerging students power world over. During the present month, IC has emerged as a strong technical women power in Region 10 of IEEE and we have received the following merits:

### **2010 IEEE Region 10 WIE Affinity Group Of The Year.**

R10 WIE coordination committee received 4 entries and has selected the **WIE Affinity Group, Hyderabad Section as the winner of the 2010 IEEE Region 10 WIE Affinity Group Of The Year.** The selection of the award is based on the performance summarized in the nominations submitted by R10 WIE Affinity Groups.

### **IEEE Region 10 WIE Support Funds.**

In 2011, R10 WIE coordination committee received 34 proposals from 23 WIE affinity groups.

Following are the results of IEEE Region 10 WIE Support Funds

#### (1) Progress Funds (\$300 \* 7 groups)

10 entries were received and the following groups have been selected.

\*WIE Delhi Section, Delhi Section

\*WIE Student Group, Institute of Technology, Nirma University, Gujarat Section

\*MES College of Engineering Thrikkanapuram(po), Kuttipuram, Malappuram(dt), Kerala Section

\*WIE Kerala Section, Kerala Section

\*WIE Indonesia, Indonesia Section

\*Japan Council Women in Engineering Affinity Group, Japan Council

\*IEEE Pakistan WIE forum, Lahore Section

#### (2) Congress/Forum Funds (\$300 \* 5 groups)

7 entries were received and the following groups have been selected.

Women In Engineering Affinity group, IEEE student Branch, DA-IICT, Gujarat Section

IEEE WIE VJCET, Kerala Section

College of Engineering ,Trivandrum, etc. (8 groups), Kerala Section

WIE Kerala Section, Kerala Section

WIE Affinity Group College of Engineering Adoor, Kerala Section

#### (3) Conference Funds (\$500 \* 3 groups, \$200 \* 2 groups)

6 entries were received and the following groups have been selected.

\*WIE Affinity Group, Hyderabad Section, Hyderabad Section (\$500)

\*College of Engineering Trivandrum, Kerala Section (\$500)

\*Government Engineering College, Barton Hill, Thiruvananthapuram, Kerala Section (\$500)

\*IEEE Malaysia WIE Affinity Group, Malaysia Section (\$200)

\*IEEE Singapore Section Women In Engineering Affinity Group, Singapore Section (\$200)

#### (4) STAR Funds (\$200 \* 7 groups)

11 entries were received and the following groups have been selected.

\*WIE IEEE JMI, Delhi Section



- \*MES College of Engineering Thrikkanapuram (po),Kuttipuram, Malappuram (dt), Kerala Section
- \*WIE SBCET, Kerala Section
- \*Vidya Academy of Science & Technology, Kerala Section
- \*College of Engineering Karunagappally, Kerala Section
- \*WIE SB TKMCE, Kerala Section
- \*IEEE SB, Government Engineering College, Bartonhill, Thiruvananthapuram, Kerala Section

IEEE India Council Education Society Chapter has been revived and Presently Prof Raghu Raman , Director, Center for Research in Advanced Technologies for Education (CREATE), from Amrita University has been appointed as Chair. He is organizing IEEE INTERNATIONAL CONFERENCE ON TECHNOLOGY ENHANCED EDUCATION (ICTEE):Theme: Educational Technology for Societal benefit :January 3-5, 2012, Amrita University, Amritapuri, Kerala, India.

IEEE India Council has also agreed to be a partner in the Conference on Social Implication of Technology being organized by IEEE Society in partnership with IEEE Singapore, SSIT, Japan and Australia.

I am sure, you all must be knowing about the IEEE Section Congress 2011 held at San Francisco during August 19-22,2011. About 1133 participant from all over the world participated. Besides the General Agenda, R10 and India Council meetings were held. During IC meeting more than 20 participant participated. The India Council meeting was also attended by the R10 Director and IEEE MGA representative. The conclusive details of the SC2011 are annexed. I am also happy to mention that the followings awards was presented to Indian Originals:

- 2011 IEEE James H. Mulligan, Jr. Education Medal to  
Prof. Raj Mittra of Pennsylvania State University**
  - 2011 IEEE Alexander Graham Bell Medal to  
Prof. Arogyaswami J. Paulraj of Stanford University**
  - 2011 IEEE Honorary Membership to  
Dr A P J Abdul Kalam Ex President of India**
- Further details can be seen at [www.ieee.org/awards](http://www.ieee.org/awards)**

The top 5 recommendations as ranked by the primary section delegates are noted below. These recommendations will be included as part of the 2012 MGA Board projects listing.

IEEE to develop a comprehensive long-term strategy to increase the number of next generation youth pursuing science and engineering careers.

As members maintain their IEEE membership over their years, IEEE must reward them for their loyalty. Rewards ought to be tangible and useful and can be done simply and inexpensively. Create Global Fidelity Programs including: (a) Continue membership Recognition 5-10-15-20 years of membership (b) Bonus for specific Benefits (e.g., reduced fee, IEEE merchandise, etc).

IEEE membership (including e-Membership) should include a Society membership as part of the basic membership fee.

Increased support to students in technical activities with grants to attend conferences and organization of technical competitions.

To encourage interest in pre-university students in engineering careers, IEEE to publish a subscription periodical (paper or electronic) targeted to high school students that highlights engineering activities of interest to those students. The periodical should also have articles promoting the benefits of an engineering career and what the students can do in college to get involved with IEEE.

Looking forward for your inputs. Thanks.



Dr. Ram Gopal Gupta

# Message from Secretary

Dear Members,

It is my pleasure to write to you. We have many activities ahead, for the benefit of the members in different disciplines/subjects. A close support is needed from all the IEEE Sections in India. Glimpses of the activities/events are as follows:

## 1. Recent Activities (June/July/August, 2011)

Initial meeting of few members organized and e-circulation was made to members

Mr Peter Sobel, Peter Sobel, Staff Director, Global Business Development

IEEE, IEEE H/Q visited Delhi on June 7, 2011, along with Mr Harish (IEEE Bangalore office). A meeting was held with few IEEE- India Council Members and business development issues were discussed, particularly about the standardization of electronic and telecom products.

A meeting of Engineers Council of India was attended by IEEE Council Members, Dr. V.R. Singh and Mr R.K. Asthana on June, 2011

## 2. Future Events

IEEE Sections Congress is scheduled to be held at San Francisco (USA) on August 16-19, 2011. Some the members will be attending the program/meeting.

A special meeting of IC Members and other delegates from India will be held on August 19, 2011 from 7 AM to 8 AM during Sections Congress in USA.

Indicon 2011 is scheduled to be held at Hyderabad on December 16-18, 2011

The Aerospace Engineering Dept. of IISc is taking lead in organizing the second edition of the conference ACODS 2012 (<http://www.acods.org/>). The conference will be organized during 16-18 February 2012

## 3. Some Useful Information for the Members is as follows:

a) vTools Portal Updates: The vTools portal has been updated to simplify finding products of interest, relevant tutorials, and to allow submission of functionality improvement requests. Please visit the [vTools Products page](http://sites.ieee.org/vtools/products/) <<http://sites.ieee.org/vtools/products/>> for the updated list of available tools. Navigate to the [vTools Tutorials page](http://sites.ieee.org/vtools/training/) <<http://sites.ieee.org/vtools/training/>> to quickly get started with any of the vTools products. Use the [Feature Requests page](http://sites.ieee.org/vtools/feature-requests-and-bug-reports/) <<http://sites.ieee.org/vtools/feature-requests-and-bug-reports/>> to report a problem or request an enhancement.

b) IEEE Smart Grid Newsletter: [IEEE Smart Grid](http://smartgrid.ieee.org/) <<http://smartgrid.ieee.org/>> and the IEEE Smart Grid Newsletter continue to make a constructive contribution to the Smart Grid conversation and industry. The July IEEE Smart Grid Newsletter includes articles from international Smart Grid experts sharing their insight, information, and lessons learned. What the Smart Grid Means—and Doesn't Mean—for India, Rahul Tongia, IEEE member and principal research scientist at the Center for Study of Science, Technology, and Policy in, Bangalore, notes the nation's unique grid requirements, where the most important technologies will be those that help constrain peak demand and peak load growth at reasonable cost, while cutting losses. Dr. Tongia works closely with utilities in India and the Indian government on smart grid issues;

c) Publicize Your Society/Council Activities on the New Official IEEE Facebook Page: IEEE recently expanded its social media presence with the creation of the official IEEE Facebook page <<http://tiny.cc/ieeefacebookpage>>. NOTE: You need to have a Facebook account to "like" this page, view its newsfeed and create posts <<http://www.facebook.com/>>. The IEEE Facebook page joins many existing IEEE Facebook pages and groups and is designed to serve as the hub of all social media activities on Facebook.

d) Society Chapters Listing Report : The Society Chapters Listing Report provides contact information for those Society Chapters whose chapter chair position is currently active. This roster is available on the Technical Activities Roster page at: [http://www.ieee.org/go/ta\\_roster](http://www.ieee.org/go/ta_roster). In order to access this roster you will need to login using your web account.

e) New IEEE Distinguished Lecturer Program Page Published: In order to provide a more accessible resource for Section/Chapter Distinguished Lecturer program information, a new IEEE Distinguished Lecturer Program web page

[http://www.ieee.org/about/volunteers/tab/distinguished\\_lecturer\\_program.html](http://www.ieee.org/about/volunteers/tab/distinguished_lecturer_program.html) has been created to assist Sections/Chapters looking for a Distinguished Lecturer. The web page includes a list of direct links to Technical Society/Technical Council program pages, replacing the former password-protected database that required a login. This new web page allows Sections/Chapters to easily link to specific Section/Chapter Distinguished Lecturer program pages.

f) Resources for Promoting e-Membership in Your Section: In response to a call for a lower cost membership option for individuals residing in developing economies, IEEE began offering the new electronic membership (e-Membership) option

[http://www.ieee.org/membership\\_services/membership/join/emember.html](http://www.ieee.org/membership_services/membership/join/emember.html) for the 2011 renewal year. e-Membership delivers all of the same benefits of traditional membership, but without paper - and of course, with reduced dues. For just US\$50 per year (plus the applicable Region assessment), IEEE members residing in eligible countries

[http://www.ieee.org/membership\\_services/membership/join/emember\\_countries.html](http://www.ieee.org/membership_services/membership/join/emember_countries.html) can choose the

g) IEEE Offers Discounts for Online Courses to IEEE Members: The IEEE eLearning Library, recently launched for organizational subscriptions, now also provides technical professionals and students with access to individual, fee-based short courses and conference workshops. Members of IEEE receive a further benefit of a members-only discount.

h) The Institute Seeks Member Achievements: If an IEEE colleague received an award, promotion, appointment, or any other achievement, please inform us to include our Member Recognitions column, by giving a brief biography of the member's career and a description of the achievement.

It is good to note that IEEE is becoming popular, day by day and more IEEE Students Branches are being launched in different institutes/colleges/universities in different parts of the country. You are approached to increase the membership further.

All the members are encouraged to send any relevant information to us, as and when available.

Dr. V.R.Singh, Fellow-IEEE

Secretary/Treasurer, IEEE India Council

# That is IT in July 2011

Prof. S. Sadagopan



## General

- ❖ India launches successfully GSAT 12 on July 15, 2011, using locally designed launch vehicle that put the satellite with twelve Extended C-Band transponders in geo-stationary orbit; the last "shuttle" service by Space Shuttle from NASA ended on July 21, 2011
- ❖ South Sudan is born on July 9, 2011; United Nations welcomed the new Nation as the 193rd Member; interestingly, Bangalore-based Sandeep Sastry of Jain University had a role in the constitution writing for this newest country!
- ❖ Political developments in India include the reshuffle of central ministry by the Prime Minister on July 12, 2011, Central Minister Dayanidhi Maran forced to resign on July 7, 2011 due to alleged corruption and Telengana crisis continuing unabated
- ❖ Man-made crises in July 2011 include Mumbai blast on July 13, 2011, Norway shootout on July 23 in Oslo and Kalka Mail derailment on July 10, 2011

## Technology

- ❖ Professor Jeffrey Boker led research team from University of California, Berkeley announced their work on "magnetic" computers (that use nano-scale magnets to "switch") that can be far more efficient than "electronic" computers on July 1, 2011 (UC Berkeley)

## Products

- ❖ **Google** launched **Google+** on July 6, 2011 reached an amazing 20 million subscribers within 20 days!
- ❖ **Facebook** launches **Facebook Video** launch July 10, 2011
- ❖ **HP TouchPad** was launched on July 1, 2011 with sales starting from July 17, 2011
- ❖ **Samsung** launches 10.1" tablet in India on July 20, 2011
- ❖ **Apple** and **Samsung** with 20.3 million and 19.2 million smart phone sales in the April – June quarter, beat 15 year lead of **Nokia** (16.7 million) according to Strategy Analytics
- ❖ **Microsoft** launched its cloud-based **Office 365** on July 5, 2011
- ❖ **Intel** unveils its cloud-based "smallest data center" on July 7, 2011

## Markets

- ❖ **Apple, Microsoft** led group buys Nortel patents for \$ 4.5 billion on July 2, 2011
- ❖ Games software major **Zynga** filed for its very ambitious IPO on July 1, 2011 but forced to revise it
- ❖ **Apple** posts excellent results with \$ 27 billion turnover and \$ 7 billion profit for April -June 2011 quarter on July 22, 2011; Indian IT services major **TCS** posts record results, 27% growth in profit and 31% growth in revenues, while **Wipro & TCS** had muted growth; **Cognizant** with its record turnover of \$ 746 million reached No 3 position among Indian IT services majors
- ❖ **Adobe** buys electronic signature technology firm **EchoSign** on July 18, 2011
- ❖ Defence equipment supplier **General Dynamics** buys **Network Connectivity Solutions**, a cloud-based solutions provider on July 18, 2011
- ❖ **Citrix Systems** buys startup **Cloud.com** for \$ 200 million

### Indian IT companies

- ❖ **TCS** posts great results; net at Rs 2,830 Crores and revenue Rs 10,800 Crores for the April – June 2011 quarter; plans to add 60,000 in the year, while the headcount is at 202,190;
- ❖ **Infosys** announces results with Rs 1,722 Crores profit and Rs 7,485 Crores turnover for April - June 2011 quarter; plans to hire 12,000 in the next 3 months
- ❖ NASSCOM Top 20 Indian IT-ITES Companies announced on July 28, 2011 include **TCS, Infosys, Wipro, Cognizant, HCL, Mphasis, Genpact, Cap Gemini India, Tech Mahindra & Aegis** as the Top 10 employers

### Education & Research

- ❖ As a follow-up of the review of IIT's, Anil Khakodkar Committee to review NIT's

### Telecom

- ❖ **Vodafone** buys out Essar finally on July 7, 2011  
TRAI recommends cancellation of 74 licenses and release 210 MHz of spectrum on July 17, 2011

### Applications

- ❖ **EPFO** (Employees Provident Fund Office) goes online in July 2011 though with some teething problems

### People

Pulok Chatterjee takes the place of TKA Nair as Principal Secretary to Prime Minister on 28th July, 2011  
India-born **Anshu Jain** becomes Deutsche Bank co-CEO on July 26, 2011

- ❖ **Thailand** elects the first woman PM on July 4
- ❖ **Lagarde** of France is the first woman Chief of IMF
- ❖ US Secretary of State **Hillary Clinton** (July 19-20), and HP Board Member of Indian origin **Vyomesh Joshi** (July 7-10) visit India during July 2011

### Numbers

- ❖ **Facebook** announced it has 750 million customers on July 6, 2011
- ❖ **Apple** sells 20+ million iPhones, 9+ million iPads and 4+ million Macs in April - June 2011 quarter; Apple sells 15 billionth App on it's AppStore on July 6, 2011
- ❖ Worldwide PC shipments in April – June 2011 stood at 85.2 million; HP is No 1; Dell at No 2
- ❖ Indian auto sector has \$ 73 billion revenue and employs 13 million people
- ❖ **Amul** goes to USA sets \$ 3 billion revenue

Percentage of poor in India dropped from 37% in 2004-05 to 32% in 2009-10 as per (NSSO July 2011)

# Eclipse C/C++ Development Environment

Nayna Jain, IBM, Bangalore.

## Introduction

Eclipse had gone long way from its start. Every year, Eclipse has its simultaneous release. Indigo was released this year on June 22, 2011. This year 62 project teams participated in this release. 46 million lines of code were released on the same day as accounted by Ohloh. 408 developers (committers) contributed to this code. 49 organizations contributed in this release.

This article, I would like to introduce Eclipse C/C++ Development Toolkit. It is an IDE built on Eclipse framework which provides all the basic and advanced features for C/C++ Developers. I would try to put here as many features as possible. However it is not possible to detail all the features here. To get the entire details look at Eclipse CDT Documentation as comes on Help -> Help Contents.

Eclipse CDT can be used in two ways:

- ♦ Use Eclipse CDT for C/C++ Project development
- ♦ Customize/Extend Eclipse CDT by developing your own plug-in

## Major CDT Features:

### Project Explorer:

Projects can be seen in the “Project Explorer” and “Navigator” view. You can open/close the projects. All the projects except the one which you are working on can be kept closed. Various context menus are available at project level, folder level, and file level. Features like Import/Export for files work on these projects.

### Editor

Major Editing Features include:

- ♦ Syntax/Keywords/Variables Highlighting
- ♦ Display of Problem Markers which includes errors, warnings and info on the vertical bar
- ♦ Quick Outline View using Ctrl+O
- ♦ Navigation of the Source Code using
  - o Open Declaration
  - o Open Hierarchy
  - o Open Type
  - o Open Resource
  - o Open Include
  - o Alt+Left/Right key to navigate code to previous and next reached code.

This is the most useful feature for new developers coming to project and trying to understand the code for the first time. And also during debugging.

- ♦ Code Folding
- ♦ Inactive Code Highlighting
- ♦ Finding and Replacing Text
- ♦ Finding Matching Brackets
- ♦ Arranging Editors Side by Side or Top-To-Bottom
- ♦ Key Bindings

### Useful Views

- ♦ Code Outline
- ♦ Console View
- ♦ Problems View – Describe Errors, warnings and info markers in the Problems View. When user clicks on this, it takes directly to the respective line in the respective file in the Editor.
- ♦ Task Tags – Users can add task tag in the editor, the part which they want to add later. For e.g., If you want to defer some functionality and want to implement it later you can set a reminder task tag, “TODO”, You can view these tasks in the “Console View”

**Preferences** Various formatting options are available on single key/mouse click

- ♦ Code Templates – These can be defined in Window->Preferences section. These are used to set the common templates across all the projects
- ♦ Custom Profile can be created at Code Formatter Preference Setting. This profile can be used to define indentation, spaces, tab space, folding, line width, and many other options
- ♦ Code Style
- ♦ Editor – Custom Profile can be created to set the text coloring, size and many other format options
- ♦ Scanner/Indexer Settings – These are provided to set the error parsers and indexers like (full indexer, fast indexer settings). Many advanced content assist settings are available based on indexer/scanner settings
- ♦ Build Preferences

### Build

- ♦ Build Output available on console view
- ♦ Recent 8.0 release provides support of differentiating colors on build console view based on Errors, problems or info
- ♦ Showing of markers on editor based on build.

## Debug

- ♦ Support for debugging C++ Core Dump, Local Application, Remote Application and post-mortem applications.
- ♦ Debug Perspective with Debug View, Variables View, Registers View, Expressions View, Breakpoints View and Console
- ♦ Debug View shows the complete stracktrace.
- ♦ Variables view displays values allows editing of variable values
- ♦ Registers view displays values allows editing of variable values
- ♦ Breakpoints view allows enabling/disabling of breakpoints. Allows, condition setting for breakpoints enablement, count enablement for breakpoints.
- ♦ Support for multi-core processors is enabled in CDT 8.0. More on these features is explained on Section What's New in 8.0

## Eclipse CDT Project Details

CDT Project Site is - <http://www.eclipse.org/cdt/>

There are two ways to setup eclipse in your system

### Download CDT Package

You can download complete Eclipse CDT from <http://www.eclipse.org/cdt/downloads.php>

Once you download it. Just unzip the package. And you get eclipse executable a click away.

### Install CDT using P2

If you already have existing Eclipse, you can install CDT on existing eclipse by using Windows -> Install Software link. You can find the p2 repository on the link <http://www.eclipse.org/cdt/downloads.php>

You need to add the repository path. It will show the available plug-in for CDT. Choose the development tools and take the next procedure.

If you don't have existing Eclipse, you can install the Eclipse Classic IDE from <http://www.eclipse.org/download.php>

Few useful CDT Resource:

- ♦ Eclipse Help Manual. Windows -> Help Contents
- ♦ <http://wiki.eclipse.org/CDT/User/FAQ>  
<http://www.eclipse.org/resources/?category=CDT>  
[http://wiki.eclipse.org/Getting\\_started\\_with\\_CDT\\_development](http://wiki.eclipse.org/Getting_started_with_CDT_development)  
Eclipse CDT Plug-in Development Help Manual . Windows -> Help Contents
- ♦ Eclipse Corner Articles - <http://www.eclipse.org/articles/>  
CDT Development Mailing List - <https://dev.eclipse.org/mailman/listinfo/cdt-dev>  
CDT Users Forum - <http://www.eclipse.org/forums/index.php/f/80/>

## Latest Release Updates

### What's New in 8.0?

Eclipse C/C++ Development Toolkit (CDT 8.0) is released as part of the Indigo release. The purpose of this article is to make readers aware of the various new features getting implemented in Eclipse releases and so will contain most popularly usable features rather than all the features in details. Readers can find the detailed "New & Noteworthy" <http://wiki.eclipse.org/CDT/User/NewIn80>

### Editor:

#### Override Markers:

Three types of annotations are shown in C++ files. These annotations are shown on the vertical bar besides the method declaration/definition. They indicate the polymorphism level of method. The annotation is in form of triangle with different fillings

- ♦ Green Triangle (Override) – Virtual method in one of the base classes is overridden.
- ♦ Empty Blue Triangle (Implement) – Pure virtual method (abstract method) in one of the base classes is overridden.
- ♦ Dark Blue Triangle (Shadow) – Method in one of the base classes with the same parameter set is shadowed.

### New Code Formatting Options

Numerous improvements are done to Code Formatter. One of these being. Users can now format constructor initialize lists, stream output expressions and inline comments.

### New Code Templates:

New code templates are available for namespaces, class declarations and for C++ test files.



## Code Analysis

- ◆ Error Markers for Unresolved Symbols  
Codan now has checker which reveals many errors while typing.
- ◆ Quick Fixes are also made available for some of the problems. Currently available for:
  - Name Resolution Problem
    - ◆ Create Local variable
    - ◆ Create Field
    - ◆ Create parameter
- ◆ Checker now shows problems for:

## New Icons for Editor for Codan Problems

Codan Errors are shown with different icons on vertical bar of Editor. This is to avoid confusion between Codan icons with editor Problem View icons

## Code Analysis Usage:

- ◆ Code Analysis can now be run on selected folder/file also using context menu
- ◆ Codan Checkers can be configured:
  - Edit scope to exclude/include files.
  - Edit launch options to run on with build or only when you edit the code.
  - Enable parameter settings for multiple checker problems in a group.

## Refactoring

### Rename Refactoring

- ◆ Support available for rename option in quick fix hover dialog
- ◆ JDT-Style inline rename refactoring support.

### Toggle Function Definition

Move function definition inside C/C++ Source Editor from one position to another and preserves correctness.

## Build

- ◆ C-Build Console is named as CDT Build Console
- ◆ Color Highlighting in build output for error, warning and info problem markers. The colors are different for each type of marker.
- ◆ Ability to reset individual error parsers in preferences
- ◆ Possible to clear old built-in include paths and symbols left after compiler upgrade in Paths&Symbols in project properties. It can be done by newly introduced “Clean” button in Scanner Discovery page.
- ◆ Support to inspect output of command to collect built-in compiler include paths and symbols.
- ◆ Support to configure automatic refresh after project builds. Configuration includes selecting specific folders for refresh.

## Debug

- ◆ It is possible to debug any binary without need to specify or even create a project in Eclipse. This is supported for all types of debugging (local, remote, attach and post-mortem)
- ◆ Support for full pretty-printing of complex structures in Variables and Expressions View as well as the advanced Debug hover of the Editor. This includes STL nested structures. It is also possible to edit the values in the nested structures. For full details on how to configure for this support, look at the link –
- ◆ Debug Views now also shows the “Processor core number” in which a particular process or thread is running.
- ◆ Variables, Expressions, Registers, Disassembly, and Memory Browser now supports opening multiple instances, and pin the view to the selected Debug context(s) in the Debug View. This can be easily used to easily compare the data in different threads.
- ◆ Many new set of preferences are added to allow users to customize their debugging experience.
- ◆ CDT now supports debugging multiple processes in a single debug session. This also means that while debugging if your current process forks a new process then, that will also be added to the debug session.

## Conclusion:

Though there are many IDEs for high level languages like Java, but C/C++ developers are still more near to their command line editor. In midst of these command line editors, Eclipse CDT comes out to be a great IDE for C/C++ Development. Every release adds a lot of new features to make developers life simpler, easier and efficient. Also, there are Linux tools which get shipped with CDT. This provides lot of tools to support debugging/profiling features. These Linux tools project are still in incubation project. Also, there is Remote CDT Project as part of PTP project which can be integrated with CDT. It is used for remote C/C++ Development. I had been using CDT for last 2 yrs and also extending it and recommend the project teams to use it for their C/C++ projects

## Report IEEE PES workshop on “Sustainable Energy: Economics, Environment and Equity” 23-24 June 2011, Bangalore, India

IEEE workshop on “Sustainable Energy: Economics, Environment and Equity” was definitely a highlight of 2011 for the Power & Energy Society Bangalore & India Council Chapters and also for the Bangalore Section. The PES Bangalore and India Council Chapters in association with National Institute of Advanced Studies (NIAS) and IEEE Bangalore Section had organized the workshop successfully on 23-24 June 2011, at NIAS, Bangalore having more than 130 registered participants who attended the workshop

The inaugural function of the workshop was held on 24<sup>th</sup> June having around 150 attendees of which about 30% being IEEE members. Dr. R. Nagaraja, Conference Convener, welcomed the gathering for the workshop and Mr. Ramakrishna Kappagantu, General Chair briefed about the IEEE, PES and its activities. Dr. Rahul Tongia, Technical Chair had briefed about the workshop and its objectives. Prof. S. L. Rao, former Chairman of Central Electricity Regulatory Commission, GOI has been the chief guest for the occasion and had delivered a befitting inaugural keynote address.

During the workshop, IEEE PES Bangalore Chapter felicitated Prof. H. P. Khincha, Iisc, Ex-Vice Chancellor, Visveswarayya Technological University with Outstanding Service award worth INR 10,000/- including a citation for his “EXCELLENCE AND LEADERSHIP IN TEACHING, RESEARCH & DEVELOPMENT AND INDUSTRY INTERACTION” in the area of power system and outstanding contributions to IEEE.

Around 24 eminent speakers from Government, Industry, Academia, Research and NGO organizations addressed the gathering on various issues of “**Sustainable Energy: Economics, Environment and Equity**”. During the workshop, six panels brainstormed on scoping the electricity scenario & requirements, renewable & fossil fuels, economic viability, environment and access & societal issues, challenges in commercial loss reduction, cross-subsidy charges and governance, next steps and roadmap ahead.

IEEE PES provided this event free and there was no fee charged for the delegates who attended the workshop without any sponsorship in view of the benefit the workshop provides for the development of power sector.

This workshop had a unique format of only panel sessions without any power point presentations. All the sessions were held in series with a panel of around five experts interacting with the delegates very actively. The workshop photos and proceedings are being published in the chapter website shortly. It is also being planned to bring out the proceedings in a book form.

The IEEE PES Bangalore and India Council Chapters thanked one and all who contributed towards the great success of the workshop. Section also profoundly thanked NIAS, POWERGRID, PRDC and other agencies in supporting the workshop.

During the workshop IEEE exhibited a stall for membership development which certainly has enhanced the membership as at least 10 % of the attendees have become members.

Reported by

Ramakrishna, Kappagartu

# 2011 IEEE Region 10 WIE Most Inspiring Engineer Award

## PURPOSE

The IEEE Women in Engineering (WIE) initiative has been established to promote achievements of women professionals in fields of interest to IEEE. IEEE WIE promotes membership growth and elevation of its members. Also, WIE gathers and disseminates information on the status of women in technology and science.

This award will be given to individual or a team (maximum two members per team) of IEEE R10 WIE members that involved in the development and completion of a project(s) or activity(ies) which are directed to fulfill one or more of the goals and objectives and which have left an undeniable imprint on the fabric of WIE operations through service to society.

## ELIGIBILITY

- Nominee must be an IEEE R10 WIE member in good standing who has made an identifiable creative achievement and/or a significant contribution toward the improvement of human relations, Women's participation in Engineering Education, social welfare and justice, and the quality of life of the people through Innovative engineering solution and/or significant contribution towards WIE activities.
- The individuals nominated must be WIE regular or student members at the time of nomination.
- Cannot be a member of the R10 WIE committee.
- Must not have received the IEEE R10 WIE Most Inspiring Engineer Award within the last 3 years.

## SCHEDULE

Call for Nominations – End of July 2011

Nomination Deadline – 30<sup>th</sup> September 2011

Recipient Selected and Notification – 30<sup>th</sup> November 2011

## BASIS OF SELECTION

The IEEE R10 WIE Most Inspiring Engineer Award is selected based on the following points relating to the candidate's eligibility:

- Impact of the projects over the society
- Uniqueness of the approach
- Outreach & societal implication
- Leadership ability

If no candidate is found to be suitable, no award will be given in the year.

## NOMINATION CONDITIONS

The nomination form sent with the Call for Nominations must be completed by Nominator who is familiar with the work and contribution of the candidate(s) and endorsed by the Section Chair. Nominator must be IEEE members of professional membership grade. Members of the R10 WIE Committee cannot act as Nominator.

- Nomination form must be sent to IEEE R10 WIE Coordinator by the end of July in electronic means (pdf file) or FAX. Make sure that an acknowledgement is received after sending the complete form, or it should be assumed that the submission is not received.

## AWARD INSTRUMENT

The winning IEEE R10 WIE Most Inspiring Engineer(s) is/are awarded a certificate of recognition.

## **SELECTION COMMITTEE**

This selection is to be done by an appropriate selection committee appointed by the IEEE R10 WIE coordinator. The decision of the Selection Committee is final.

## **PRESENTATION**

The IEEE R10 WIE Most Inspiring Engineer Award would be sent to the R10 Section for the presentation at an appropriate event.

## **NOTIFICATION AND RECORD**

The IEEE R10 WIE Coordinator notifies the result of selection by e-mail to the R10 Sections, on the R10 Website and in the R10 Newsletter. The IEEE R10 WIE Coordinator also maintains a record of award recipients on the R10 Website.

## **NOMINATIONS SUBMITTED TO**

IEEE R10 Women In Engineering Coordinator Prof. Takako Hashimoto To: [takako@cuc.ac.jp](mailto:takako@cuc.ac.jp) Cc: [ieeepo@pacific.net.sg](mailto:ieeepo@pacific.net.sg) FAX: +65 6778 9723

# Enhanced Imaging in Synthetic Aperture Radar (SAR) using Compressed Sensing

Vijay Kumar

Member IEEE (Member No. 80586926)



## INTRODUCTION

The most signal acquisition protocol used in the consumer audio and visual electronics, medical imaging devices & radio receivers are based on Shannon's theorem, the sampling rate must be at least twice the maximum frequency present in the signal (Nyquist rate). While in most of the cases we compress the data soon after sensing, trading of signal representation complexities for some error, which is wastage of valuable sensing resources.

## COMPRESSED SENSING

It is a technique for acquiring and reconstructing a signal utilizing the prior knowledge that it is sparse or compressible. The idea of compressed sensing is to use the low information content of the most real life images to overcome the limitation imposed by Shannon-Nyquist sampling theorem while acquiring the data. Generally Shannon's theorem limits the reconstruction of image or signal if we have no information about that image or signal. But if you know the image is sparse or compressible, then Shannon's limit does not apply. Hence compressive sensing asserts that we can recover certain signal & image from far fewer sample or measurement than traditional methods used.

Compressed sensing based on two principles: Sparsity (it pertains to the signal of interest and express the idea that information rate of a continuous signal may be much smaller than suggested by its bandwidth) and Incoherence (it pertains to the sensing modality & extends the duality between time and frequency. It expresses the idea that objects having sparse representation must be spread out in the domain in which they are occupied).

## SYNTHETIC APERTURE RADAR

Synthetic Aperture Radar (SAR) is very efficient instrument for obtaining a better understanding of the earth's environment due it's all weather and day light imaging capabilities. SAR is a form of radar in which multiple radar images are processed to yield high resolution images than would be possible by conventional means. The many echoes waveform received at the different antenna positions mounted on a moving platform (satellite or airplane) are post processed to resolve the target. SAR has been widely used in remote sensing and mapping.

## COMPRESSED SENSING FOR SYNTHETIC APERTURE RADAR IMAGING

Modern SAR system have an on board hardware basically a transmitting and receiving end, analog to digital converter followed by a real time data link and storage facility. One of the major constraints in the design and operation of SAR system is the non availability of a down link with high data rate. Hence in SAR system the data can be processed on board because of the presence of less computational resources and the steadily increasing resolution of SAR. So the data must be transmitted to the ground where the image formation process is performed. The SAR image data are now constraint by on board storage facility and transmission links.

Thus, the efficient algorithms for SAR data compression become very necessary to fulfill the requirements like high resolution and large swath of advanced SAR system. Many techniques has been used in past for SAR data compression in the past. Compressed sensing is also one of the most appealing techniques in the recent past for the purpose of SAR data compression. Compressed Sensing has been preferred by many of the researcher for the SAR data compression over conventionally used Fourier based compression technique at the cost of significant increased complexities for the decompression because of its excellent performance during denoising and superresolution processes.

Compressed sensing has been used by many researchers in the past for the compression of SAR data to meet the demand of high resolution imaging. Few researchers have also reported the use of compressed sending for the compression of SAR data to meet the demand of enhanced imaging.

Some of the other methods which may be used for the purpose of enhanced imaging in SAR are:

1. By Using the certain artificial neural network or fuzzy based image enhancement techniques in addition to the compressed sensing.
2. By doing certain kind of probabilistic signal processing while image formation process.

## REFERENCES

1. U. Benz, K. Strodl, and A. Moreira, A comparison of several algorithms for SAR raw data compression. *IEEE Transactions on Geosciences and Remote Sensing*, 33(5):1266–1276, Sep 1995.
2. D.L. Donoho. Compressed sensing, *IEEE Transactions on Information Theory*, 52(4):1289–1306, April 2006.
3. G. Rilling, M. Davies and B. Mulgrew, Compressed sensing based compression of SAR raw data, *SPARS'09 - Signal Processing with Adaptive Sparse Structured Representations*, April 2009.
4. L. Zhang, M. Xing, C.W. Qiu, J. Li, and Z. Bao, Achieving Higher Resolution ISAR Imaging With Limited Pulses via Compressed Sampling, *IEEE Geosciences and Remote Sensing Letters*, 6 (3): 567-572, July 2009.
5. Richard G. Baraniuk, Compressive Sensing, *IEEE Signal Processing Mag.*,: 118-122 July 2007.
6. J. D. Coker and A. H. Tewfik, Compressed Sensing and Multistatic SAR, *IEEE International Conference on Acoustics, Speech and Signal Processing, 2009. ICASSP 2009*, 1097–1100, April 2009.
7. Matthew Herman and Thomas Strohmer. Compressed sensing radar, *IEEE International Conference on Acoustics, Speech and Signal Processing, 2008. ICASSP 2008*, 1509–1512, 31 2008-April 4 2008
8. Y. Wiaux, G. Puy, Y. Boursier and P. Vandergheynst, Compressed sensing for radio interferometry: prior-enhanced Basis Pursuit imaging techniques, *SPARS'09 - Signal Processing with Adaptive Sparse Structured Representations*, April 2009.
9. E.J. Candes and M.B. Wakin, An introduction to compressive sampling, *IEEE Signal Processing Magazine*, 25(2):21–30, March 2008.
10. Richard Baraniuk and Philippe Steeghs, Compressive radar imaging, Radar Conference, 2007 IEEE, 128–133, April 2007.
11. Piotr Indyk, Explicit Constructions for Compressed Sensing of Sparse Signals, *Nineteenth annual ACM-SIAM symposium on Discrete algorithms*, 30-33, Jan. 2008
12. Matthew A. Herman and Thomas Strohmer, High-Resolution Radar via Compressed Sensing, *IEEE Transactions on Signal Processing* (to appear)
13. S. Bhattacharya, T. Blumensath, B. Mulgrew, and M. Davies, Fast encoding of synthetic aperture radar raw data using compressed sensing, *IEEE Workshop on Statistical Signal Processing*, Madison, USA, August 2007.
14. Justin Romberg, Imaging via Compressive Sampling, *IEEE Signal Processing Magazine*, 25(2):14–20, March 2008.
15. Mark D. Plumbley, Marco Bevilacqua, Sparse reconstruction for compressed sensing using stage wise polytope faces pursuit, *16th International Conference on Digital Signal Processing*, July 2009

## **Report of “One Day Tutorial on Simulation of Wired and Wireless Networks using NS2 Simulator”**

One Day Tutorial on Simulation of Wired and Wireless Networks using NS2 Simulator, a joint event of IEEE Gujarat Section and the IEEE Computer Society Chapter, India Council was organized on Tuesday, 12th June 2011 at Ahmedabad Management Association (AMA), Ahmedabad, Gujarat, India. The event was presided by Dr. Savita Gandhi, Chairman, Technical Activities of IEEE Gujarat Section and Professor & Head, Department of Computer Science, Gujarat University, Ahmedabad. The Chief Guest of the function was Dr. Akshai Aggarwal, Vice Chancellor, Gujarat Technological University (GTU), Ahmedabad. He delivered the Keynote Address through telephonic conference (in his speech he elaborated about importance of this kind of tutorial & emphasizes to use NS2 open source simulator to carry out valued research) at which 86 researchers, faculty members, PG and UG final year students from 20 organisations across Gujarat State from reputed institute and R&D centre include Space Application Application(SAC), ISRO, Ahmedabad, DA-IICT, Nirma University and Dept. of Computer Science, Rollwala Computer Centre, Gujarat University etc. attended the tutorials. Dr. Deepak Ghodgaonkar, Chairman, IEEE Gujarat Section could not attend the inaugural session and wished the event a great success. NS2 Network Simulator is widely used in research and teaching field of Wired, Wireless and Sensor Networks. The tutorial was conducted by Mr. Mohit Tahiliani, Ph.D Research Scholar, NIT, Surathkal, Karnataka, India.

Mr. Mohit Tahiliani began with the fundamental concept of Networking, Need for Simulator in research and described Structure of NS2, Introduction to Tool Command Language (TCL) Script, how to create a simple network topology and Traffic Sources, recording data in output files, how to write awk script to extract data from trace .tr file and demonstrated live example for Wired and Wireless Networks using NAM and plotted graph (using xgraph) showing the results of simulations. The major topics that he has covered include explanation of generating traffic-connection and node-movement files for large wireless scenarios.

The tutorial sessions were followed by interesting question-answer session. Overall tutorial was highly interactive and participants gained a lot out of this.

At the end of the function in the evening, Dr. Savita Gandhi welcomed gathering to concluding session and proposed vote of thanks. Mr. Nirbhay Chaubey, Vice Chair, IEEE Computer Society Chapter, India Council co-ordinated the tutorial along with IEEE Gujarat Section Officer and briefed gathering about IEEE and IEEE Gujarat Section and appealed delegates to become IEEE Members. The participants like Prof. K. P. Aggarwal, Nirma University, Ahmedabad, Professor Ninad Bhavsar, SVIT, Vasad, Gujarat highly appreciated the efforts put-up by the IEEE Gujarat Section in their feed back speech.

Reported by,

Dr. Savita Gandhi  
Chairman, Technical Activities  
IEEE Gujarat Section