IEEE India Info

IEEE India Council
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IEEE The Institute of Electrical and Electronics Engineers. Inc

Message from Chairman

July 2011.

Dear Members,

Greetings from IEEE INDIA COUNCIL, During the last month, IEEE India Council has been recognized as emerging students power world over. We have received the following merits :

2010 R10 Outstanding Branch Counselor

Nirbhay Chaubey,Counsellor, IEEE ISTAR Student Branch (Code - 65201) and Chair, MDC, IEEE Gujarat Section,Assistant Professor of Computer Science,Institute of Science and Technology for Advanced Studies and Research has been elected 2010 R10 Outstanding Branch Counselor.

Region 10 Website Competition:
2nd Place: USD350 & Certificate
IEEE Student Branch Manipal, Bangalore Section
(http://www.ieee-manipal.org/)
3rd Place: USD200 & Certificate
IEEE Jamia Millia Islamia, Delhi Section
(http://www.ieeejmi.com
Student Paper Contests:
3rd Place: USD200 & Certificate
Amar Kumar Nandan and Ritesh Kumar Kalle (International Institute of Information Technology, Bangalore)
"VP8 Video: Performance Evaluation, Modeling and Frame Size Prediction"
UG
2nd Place: USD200 & Certificate
Ramesh N Nair, Sai Manoj P, and Mithun Mohan (Amirta Vishwa Vidyapeetham)
"Gesture Based Wheelchair Control for the Physically Challenged"
3rd Place: USD150 & Certificate
Amarjot Singh, Srikrishna Karanam, and Devinder Kumar (National Institute of Technology, Warangal) "Constructive Learning for Human-Robot Interaction"

Larry K. Wilson Regional Student Activities Award Imran Ali (Jamia Millia Islamia, Delhi Section)
Region 10 Exemplary Student Branch
3rd Place: Certificate
Thangal Kunju Musaliyar College of Eng, Kolam (Kerala Section)

Big Heartiest CONGRATULATIONS to all INDIVIDUALS, Chapter and Sections.

In the coming month, we are going to have IEEE Section Congress. Inputs from all of you are welcome.
Our emphasis in the congress will be on the following:

- More and more involvement of the developing countries participation in the educational activities.
- Linkage with industry for all the courses /tutorials /web courses etc sponsored and offered by the IEEE
- International agencies working in the developing countries shall actively involved IEEE volunteers wherever it is easily possible.
- Less and less burocarcy approach towards networking facilities to the volunteers of IEEE. Communications should be used as one of effective means to bring closeness to the World.
- Association of IEEE with the Local Accreditation and Professional bodies to reach the Profession General Mass.
- Aggressive approach should be adopted by IEEE to involve local commercial organizations for the requirements of IEEE.

We are also having our executive committee meeting on 19th August from 7 AM to 8 AM during Sections Congress in SFO, USA. All Indian participants are requested to kindly make it convenient to attend. Voting rights will be reserved to the voting members of IEEE India Council

Looking forward for your inputs. Thanks.

Dr. Ram Gopal Gupta

That is IT in June 2011

Prof. S. Sadagopan

General

- UN Secretary General Ban Ki-Moon gets a second term
- IBM celebrates centenary in June 16, 2011
- Smaller coins (less than 50 paise) become history on June 30, 2011
- GoAir places orders worth $ 7.2 Billion on Airbus
- Crusade against corruption throws up unusual outcomes that includes Baba Ramdev fast, midnight arrest and tame end during May end to June 6
- Diesel and LPG become costlier from June 26
- Maruti plant in Manesar, Gurgaon observed strike for 10 days (June6-17)

Products

- **Google** launches StreetView in India on June 9, 2011 (starting with Bangalore)
- **Apple** announces iCloud music service, iOS 5 and Mac OS 10 new release Lion on June 6, 2011
- **RIM** launches BlackBerry Playbook in India on June 22, 2011
- **Nokia** announces MeeGo-powered N9 for the global market and Dual SIM India made phone for the Indian market
- **SNK** E-Tax launches online tax filing E-Tax on June 15, 2011

Markets

- **CapGemini** buys Prosodie for € 382 Million on June 14, 2011
- **Ericsson** acquires Telcordia for $1.15 Billion on June 14, 2011

Indian IT Companies

- **Infosys Technologies** becomes **Infosys**; **Infosys** inducts V Balakrishnan, BG Srinivas, Ashok Vemuri and Ann Fudge into its Board; announces transition; Founder & Chairman NR Narayana Murthy to hand over charge to K V Kamath, the incoming Chairman on August 20, 2011 (approved on June 11, 2011 in the AGM)

MNC IT Companies in India

- **ARM** India has 300 of the total 1,300 design engineers
- **IBM** completes 100 years globally and 60 years in India (with gap during 1977-1991)
- **Huawei** plans $150 million expansion of India Lab

Education & Research

- Infosys co-founder Nandan Nilekani and his wife Rohini donate Rs 50 crores to IIHS (Indian Institute of Human Settlement) on June 28, 2011
- IIM Tiruchirapalli (11th IIM) starts functioning from June 2011
- India-born Professor Chandrakasan to head EECS Department at MIT from July 2011

People

- NR Narayana Murthy gracefully hands over charge to KV Kamath on June 11, 2011 AGM
- Ajit Kumar Seth IAS takes over as Cabinet Secretary on June13, 2011
  Mathai to becomes Foreign Secretary in place of Nirupama who will become Indian Ambassador to USA
  Distinguished visitors to India in July 2011 include New Zealand PM (June 26), Slovenian PM (June 10-14), ARM CEO Warren East and COO Graham Budd (June 20-23), Cisco CEO John Chambers, Xilinx CEO, Northwestern University President Shapiro
- Bar code creator Alan Haberman of Ohio died on June 15,2011 (the first bar code reader in Marsh supermarket went live on June 26,1974!

Interesting Applications

- Indian companies can use Video conferencing for AGM
- Data.Gov.In to be up soon
- Union Bank of India to add 2,500 ATMs by March 2012
- E Books sales exceed print books sales on Amazon as of May 15, 2011

Interesting numbers

- Mobile subscribers in India increased by 13.35 million in May 2011 to touch 840.28 million by May 31, 2011; of the 840.28 million 588.13 million subscribers were active as of May 31, 2011; wire-line subscribers decreased by 0.15 million in May to touch 34.40 million by May 31, 2011; broadband subscribers increased from 12.01 million to 12.12 million by May 31, 2011 (TRAI)
- Foreign exchange reserves as on June 30, 2011 was $ 315.72 billion (RBI)
- Sensex on June 30, 2011 was at 18,845 (BSE)
- US Dollar stood at Rs 44.72 on June 30, 2011 (RBI)
- Global enterprise software to touch $ 288 billion in 2012 (Gartner)

Professor Sowmyanarayanan Sadagopan is the Director of IIIT-Bangalore. These are his personal views. He can be reached at

ETHICAL CONCERNS In Biotechnology

Dr.S.Thiruvengadam, Professor of Eminence
Department of Electrical Engineering
Valliammai Engineering College. Chennai

1.0 Introduction

Ethical concerns in this case can be divided into a number of areas spanning biotechnology, effects on environment and human health and resultant impact on social and economic conditions and related cultural values. Certain issues arise specifically from the intrinsic nature of biotechnology, while others such as the exploitation of poor nations by rich ones, are part of an existing dilemma.

2.0 The following are some examples of issues arising from biotechnology calling for ethical concerns:

1. Environmental safety

- Will genetically altered organisms upset the balance of population in natural ecosystem?
- Will modified organisms transfer their altered genes to wild relatives or reduce biodiversity ?

2. Food safety and health

- Will food from modified crops or livestock be safe to eat?
- Will genetically altered food have less nutritional value?

3. Social and Economic effects

- What effects will the outcome of biotechnology have on the business of farming around the world?
- Will patent control give control of key crops to a few large corporates?
- Are poor countries being exploited of their natural sources?
- Do we have the right to refuse to use B.T if it helps treat diseases and increase food production?

Regulatory issues

- Do current regulations give adequate protection to farmers, consumers, livestock and environment
- Should procedures be put in place to label genetically altered food products?
- The attitude of common man on these issues is modulated, mostly through the media.
- He has to think

Who provides the information?

Does it present a balanced perspective?

Does it deal with various genuine concerns people have about biotechnology?

3.0 Researches at the centre for biotechnology policy and ethics at Texas university have identified three broad segments of people with varying attitudes. One group, about one of three covered by survey, felt that B.T

offers more benefits than harm to society. These people generally have faith in the ability of science and technology to solve problems.

A second group, about one fourth of those surveyed felt that B.T involves more dangers than benefits.

A third group representing about 40-50% of the people believe, it is equally beneficial and dangerous to society. This set of people are inclined to weigh each issue on its merits and guide the developments in B.T field to useful conclusion.

4.0 **Another issue that is common to all activities in Engineering and Technology is 'SAFETY' in this context the following specific problems become relevant.**

1. PATHOGENICITY: Potential ability of living organisms and viruses to infect humans, animals and plants and cause diseases.
2. TOXICITY AND ALLERGY: This is associated with microbial production.
3. Other medically relevant effects like, increase in environmental peril of antibiotic resistant micro organisms.
4. Problems associated with disposal of spent microbial biomass and the purification of effluents from B.T processes.
5. Safety concerns associated with contamination, infection or mutation of process strains.
6. Safety related to industrial use of micro organisms.

5.0 One other aspect is the actual risk assessment

1. Elucidation of the capacity of micro organisms to have an adverse effect on humans environment
2. Establish the probability that micro organisms might escape either accidentally or inadvertently from the production process
3. Evaluate the safety of the desired products and methods for handling bye- products.

6.0 Conclusion:

Actually when properly practiced, biotechnology is safe and the benefits obtained from biotechnological innovations will lead to improvement in health and well being of world's population. However certain sound regulatory measures should be introduced in the development and application of biotechnology

BEYOND THE MOBIUS STRIP

28 September, 2010

Tofique Fatehi
tofiquef@yahoo.com
http://tofique.fatehi.us

Let's go beyond the Mobius Strip. I am presuming that you are familiar with the Mobius Strip. The Mobius Strip is usually made of thin paper. Any other material would do equally well. "Thin" means of zero thickness. (At least theoretically.) If we were to use a thick paper, then as the thickness increases, it would become increasing difficult to bend and twist the paper to form a Mobius Strip. In that case, paper may then be not the ideal material. But we can use a soft, flexible rubber sheet instead. (That's the reason why Topology is nick-named Rubber-Sheet-Geometry).

By introducing a thickness, we have landed up with two alterations to the Mobius Strip. Instead of one edge, we now have two edges - with the thickness in-between. And instead of just one surface, we now have two surfaces. Otherwise, the loop retains the other characteristics of the Mobius Strip. Strictly speaking, it is no longer a Mobius Strip.

The thin paper was easy to form a loop - by just overlapping a bit of the ends and gluing them (lap joint). But when the material has a visible thickness, this looks ugly. It is neater to bring the two end sections together - butt to butt - and stick them (butt joint) so the joint is hardly noticeable.

In case you are not familiar with the Mobius Strip, please read this brief introduction before proceeding. In fact do make one.

Take a long strip of paper - the length being at least eleven times the width, but preferably much more - say twenty to thirty times the width. Bring the two ends towards each other (as if to form a loop) and give a full twist (180°) to one end and stick the two ends together. You now have a twisted loop, known as the Mobius Strip. It matters little whether the twist is in one direction or the other - clockwise or anti-clockwise. The two models are mirror-images of each other, with otherwise identical properties.

The Mobius Strip has some peculiar properties - it has one edge (boundary) and one surface. You cannot colour one surface red and the other surface blue - because there *is* no "other surface". Only one surface.

Now try cutting the strip through the middle of its width. All round the loop. You would expect two loops. But surprisingly, you get *one* big double-twisted loop. Show this to the kids, and they will think it is "magic".

Next try cutting the strip - not through the middle, but through a point approximately one-third the width. In effect, you will think that you are cutting the strip into two unequal widths - one-third and two-thirds. When you have cut round the loop once, you will be surprised to discover that you have *not* come back to the point where you started, but to a point which is about one-third the width away from the "other" edge. (But there is *no* "other" edge - remember, the Mobius Strip has *only one* edge). But continue cutting round the loop a second time around and you will land up at the first point you started. We get the illusion that we have cut the Mobius Strip into three equal parts, each having a width approximately one-third the original width. But, you will see that this is not so. You get just two loops - one big and one small - and both interlinked. The smaller loop is itself a Mobius Strip, and the bigger loop has a double twist. This is even greater "magic" for the kids.

MODEL #1

Suppose the thickness is big enough to be equal to the width of the strip. In effect, we get a square cross-section. Take a soft, flexible rubber rod, square in cross-section - one unit by one unit - and twenty to thirty units long. Bend it to form a circular loop and then twist one end by 180° and butt join the two ends. We get a loop which has two edges and two surfaces. Take a knife and cut through the square cross-section to form two identical rectangles (half-squares). Cut right round the loop. We will end up into *one* big loop (twice as big as the original) with a rectangular cross-section of half the original area.

MODEL #2

Next, take a soft, flexible rubber rod as before. Bend it to form a circular loop as before, and this time, give a twist of 90° and butt join the two ends. This is truly beyond a Mobius Strip. The figure we now have has *one* edge - going round the loop four times, and *one* surface - also going round the loop four times. If as before, we cut through the square cross-section, (into two half-squares) - all round the loop - we come back to the section we started with, but the cut is at right angles to the one we started with. If we continue cutting, we will be cutting the two rectangles into four squares - each square one fourth the original square. After the second round, we come back to the original cut. The result is *one* big loop - four times the original, with a square cross-section which is one-fourth the original square.

MODEL #3

In this model, we give a twist of 270° and join the ends. This is not the same as model #2 above. It is not even its mirror image, but a uniquely different model, although some of the properties are similar to those of model #2. It also has one edge and one surface, but more twisted. Cutting the cross-section yields on big loop four times the size of the original loop but - again more twisted than for model.

MODELS #4 TO #8

The next set of figures start with a soft, flexible rubber rod, having a regular hexagon for its cross-section. (Now we are going way beyond Mobius, but without losing sight of Mobius). We bend the hexagonal cross-section rod to form a circular loop and twist one end before butt joining the two ends. The angles of twist for the several models are: 60° (#4), 120° (#5), 180° (#6), 240° (#7) and 300° (#8). Each of these is a unique model.

Cutting the cross-section into half along a line joining the mid-points of two opposite sides of the hexagonal cross-section yields these results:

Model #4: The cut will go round the loop three times before closure and yield one big loop - six times the size of the original loop and having one-sixth the cross-sectional area of the original loop.

Model #5: The cut will go round the loop three times before closure and yield two big loops - three times the size of the original loop and having one-sixth the cross-sectional area of the original loop.

Model #6: The cut will go round the loop once before closure and yield one big loop - twice the size of the original loop and having one-half the cross-sectional area of the original loop. - This model is almost akin to the Mobius and also model #1. They all have a 180° twist.

Model #7: Almost the same effect as for model #5, but there are more twists in the loops. It is to be noted that this is not a mirror-image of model #5.

Model #8: Almost the same effect as for model #4, but there are more twists in the loop. It is to be noted that this is not a mirror-image of model #4.

MODELS #9 AND #10

The square and the hexagon are figures with even number of sides. Just for an example, let us consider a figure with odd number of sides for the cross-section - say, the simplest figure - an equilateral triangle.

Now the soft flexible rubber rod has an equilateral triangle for its cross-section. The twisted circular loop may be formed with a twist of either 120° or 240°, which gives us two different models. The halving of the cross-section would be done by making a cut from any vertex of the triangle to the mid-point of the opposite side. In either case, the cut will go round the loop three times before closure. The yield would be two big loops, three times the size of the original loop with a cross-section one-sixth the area of the original triangle. Topologically, these effects are the same as for models #5 and #7 respectively. They all have an angle of twist of 120° or 240°.

ANGLE OF TWIST

Notice now, that the angle of twist is what determines the topology of the model and not the shape of the cross-section. However, choosing a regular polygon cross-section aids in visualising the models better.

We may now define the angle of twist. If the cross-section is an m-sided polygon (m is an integer), then 360/m (degrees) may be referred to as the primary angle of twist for that loop, and may be designated as α for that model. This ensures that a twist of α will rotate the butt-ended cross-section out-of-phase once, but will still align the sides and corners of the ends, to form a perfect butt-end. The other derived angles of twist may be integer multiples of α or nα where n is an integer. The two butt-ended cross-sections will now be out-of-phase n times, but will still align the sides and corners of the ends, to form a perfect butt-end. α need not be an integer number of

degrees. Any number of degrees that is not a sub-multiple of 360° will not do for α, as we will not get a perfect closure.

BISECTING THE POLYGONAL CROSS-SECTION

One of the labours on these models is cutting the cross-section into half.

For even sided polygons (m is even), this cut may be along a mid-line passing through the mid-points of the two opposite sides of the polygon. Alternatively, the mid-line may pass through the two diagonally opposite corners of the polygon. For my sample models, I have preferred the first alternative.

For odd sided polygons (m is odd), this cut is easiest if done along a mid-line passing through one corner, and the mid-point of the opposite side.

We may choose any other cut lines provided it passes through the mid-point of the polygon. It will only complicate the visualisation.

SOME END RESULTS

The (only) angle of twist for a Mobius Strip is 180°. 180° is also one of the derived angles of twist for all even-sided (m is an even integer) polygon. They all behave in a similar manner as the Mobius Strip. A cut through the mid-line of the cross-section will go round the loop once before closure, and result in one big loop twice the size and with half the cross-sectional section.

For a primary angle of twist, α, we find these interesting observations (more for the serious mathematicians to dwell on further)

For an even sided polygon (m is even), the cut goes round the loop m/2 number of times before closure and results in one big loop m times the size and having 1/m times the cross-sectional area. (see models #2 and #4).

For an odd sided polygon (m is odd), the cut goes round the loop m number of times before closure and results in two big loop m times the size and having 1/2m times the cross-sectional area. (see models #9).

A similar result ensues for a complimentary angle of twist of (360 - α) but the final loops are more twisted than above. This complimentary angle may be designated as Ω.

If m is a perfect square (or cube, or higher powered number), we do get some interesting and unusual variations to some of the non-primary angled loops. They still follow the rules, but with some extra clauses to the rules. If m is not a prime number, there are yet more such variations.

A lot more work has to be done for some mathematical formulations of these rules. I would welcome all such meaningful formulations.

THE SQUARE SECTION AGAIN

We go back to the loop with a square cross-section and twisted by 90°. Instead of bisecting the square, we now trisect the square - by a cut parallel to one side of the square, not passing through the centre of the square, but rather at a distance of 1/3 the side. In effect we will be cutting the square into two unequal rectangles of 1/3 and 2/3 the area of the square. We cut continuously round the loop and come back to the starting section, finding that the cut is now at 90° to the cut we started with, and at 1/3 the distance from one of the adjacent sides of the square. Continuing to cut for the second round, we come back to the starting section with the cut rotated a further 90°, or a total of 180° and parallel to the cut we started with but at a distance 1/3 the side of the square. After the third round of cutting we come back to the starting section with the cut rotated a further 90°, or a total of 270° to the start of the cut. The fourth round of cutting will bring us back to coincide with the original starting cut, having rotated a full 360°, thus achieving a perfect closure. In effect, we will have trisected the square cross-section in both directions into nine small squares arranged into a 3x3 matrix. The end result is that we get three loops all entangled with one another. One loop (the core of the 3x3 grid) the same size as the original and two uniquely different loops which are four times the original loop size. All these loops have a cross-sectional area of 1/9th the original area. The core loop is essentially unchanged in its topological structure, except that its cross-section is 1/9.

NIRBHAY CHAUEY HAS BEEN AWARDED 2010 RIO OUTSTANDING BRANCH COUNSELOR AWARD BY IEEE REGION 10

Nirbhay Chaubey (S'2002, M'2004) graduated from Ranchi University, Ranchi, Jharkhand, India in 1994, Post Graduate Diploma in Computer Science Degree & Master's of Computer Science Degree at

Madurai Kamraj University, Madurai, India in 2001 and 2004 respectively. Presently working as an Assistant Professor of Computer Science at Institute of Science and Technology for Advanced Studies and Research (ISTAR), Gujarat Technological University, Vallabh Vidyanagar, Gujarat, India. He is continuing his Ph.D (Computer Science) Program at Department of Computer Science, Gujarat University, Ahmedabad, India and expecting his Ph.D degree in late 2011. His current research interests include "Security for Mobile Ad Hoc Network (MANET)". He also worked as a System Analyst for the project title "Sharable Information Management System (SIMS)" for Space Application Centre, Indian Space Research Organization (ISRO), Govt. of India, Ahmedabad, for the duration of 12th August 2003 to 18th June 2004.

Currently, he is working as an Officer on Special Duty (OSD) to Gujarat Technological University (GTU), Ahmedabad (from 21st February 2011 to 20th August 2011). He presented several research papers in various National and International conferences.

HiscontritiontotheIEEEGujaratSectionandIEEEIndiaCouncilatlargeisoutstan

ding:

IEEE Gujarat Section: Chair, Membership Development (Year 2009 onwards)

IEEE, India Council: Vice Chair, Computer Society Chapter (Year 2010 onwards)

IEEE, Communication Society Chapter, Gujarat Section: Chairman (For year 2009)

IEEE, Gujarat Section: Treasurer, (2005-2009)

IEEE, Gujarat Section: Secretary and Treasurer, (2006-2007)

IEEE, Gujarat Section: Executive Secretary (1998-2005)