The Educational Activities Board and Region 8

A Presentation for Region 8 Volunteers

Moshe Kam,
VP for Educational Activities

14 April 2007

What are the objectives of this talk?

- Provide you with better understanding of EAB
  - What it is, what it does
- Discuss specific activities that Region 8 can participate-in/ develop/ use
- Hear from you how EAB can serve Region 8 and IEEE better

Educational Activities Board

- One of the six (6) major Boards of IEEE
- Responsible for IEEE's activities in pre-university, university-level and post-university (continuing) education
  - Including accreditation
- 15 Board members
- Approximately 60 committee members
- Staff support of 15
  - Educational Activities Department

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EAB: SMALL BUT POWERFUL


IEEE
Educational Activities Board 2005

Recent Staff Changes: Managing Director

- In April 2007 Ms. Barbara Stoler retired
  - She continues to work for EAB on special projects

- Dr. Douglas Gorham serves as Managing Director Pro Tem

Dr. Douglas Gorham

- Joined IEEE in 2000
- Director of Educational Outreach
- Served as a pre-university educator for twenty-six years
  - including twelve years as a high school principal
- In his position with IEEE, Doug has focused on
  - promoting technological literacy among pre-university educators and their students
  - developing collaborations between engineers and their local pre-university community
  - Deans Summit
  - TryEngineering Portal
  - Teacher In-Service Program (TISP)

IEEE

Outline: Principal Activities

- Pre-university Education
  - Teacher in Service Program
  - TryEngineering.org
  - The Munich Summit
- University Education
  - Model Curricula and Policies
  - Accreditation
  - Women in the Engineering College
- Post-university Education
  - Expert Now IEEE
- Recognition of leaders in education

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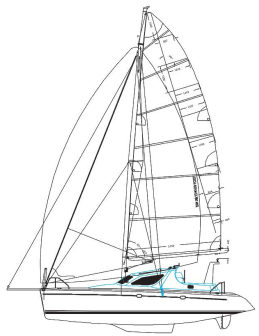
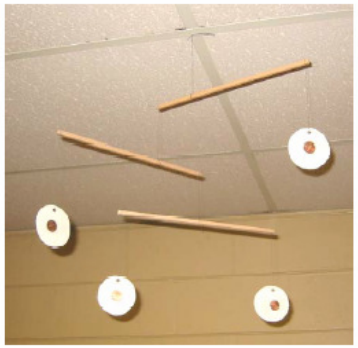
The Teacher in Service Program

“Engineering in the Classroom”

The Basic Approach – Lesson Plans

- IEEE volunteers and consultants develop lesson plans that highlight an engineering design topic
  - How to build a balanced mobile (rotational equilibrium)
  - How to design a sail for a ship (aerodynamic design)
- The lesson plans are geared toward pre-university students and are tested in the classroom
- Materials for a 30-student class cost no more than $100





Lesson plans

- The lesson plans are organized in two versions
  - For the teacher
  - For the student

- The lesson plans are aligned with educational standards

Volunteer Training

- EAB arranges for a training session for Section volunteers
  - How to conduct a training sessions for teachers using the TISP lesson plans
  - How to approach the school system to engage teachers
  - How to align a lesson plan with local education criteria
- The training requires a day and a half
- Teachers and officials from the education establishment participate in the training sessions

History of TISP 2001-2006

- 52 TISP presentations have taken place
  - Malaysia, South Africa and the US
- Over 1250 pre-university educators have participated
  - Representing more than 135,000 students
- More than 90% of the attendees indicated that they would use the concepts presented in their classroom instruction

Sample TISP Topics

- Everything You Wanted to Know About Electric Motors But Were Afraid to Ask
- Rocket Cars and Newton's Laws
- Rotational Equilibrium: A Question of Balance
- Effective Lighting
- Get Connected with Ohm's Law
- Design and Build Your Own Robot Arm
- Learn to Program and Test Robots for Classroom Use

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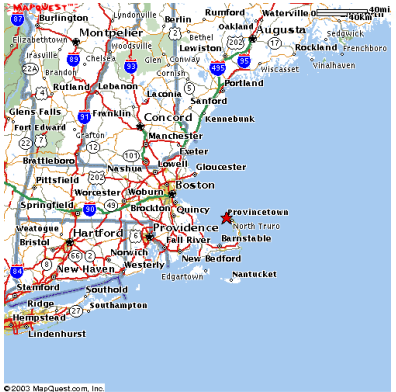
Notable successes and failures

- In South Africa we have reached more than 600 teachers less than 6 months after the TISP session was conducted
- In Region 1 we have reached no teachers (0) within a year of the training session
- The key: bringing to the training session volunteers who plan to go to the schools and do the work



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More about our success in Region 8 – South Africa

- Success in South Africa was due to the following factors:
  - A strong leader
  - A strong heterogeneous organizing committee
  - Involvement of educators
  - Involvement of students
  - Involvement of governmental bodies

A Broad Coalition

The Local Section: Chair of the IEEE SA Section Tinus Pretorius

Education Department: Jan Randewijk

National Education Department: Penny Vinjevold

Local Engineering Association: Mr Viv Crone, President, South African Institute of Electrical Engineers

Local students

EAD: Doug Gorham

EAB: Moshe Kam

What did we do in 2006?

- 5 TISP training workshops
- Region 1 (Boston)
- Region 3 (Memphis)
- Region 4 (Indianapolis)
- Region 8 Cape Town, South Africa
- Region 10 Putrajaya, Malaysia

- Over 330 people attended these training sessions representing 36 IEEE Sections

- More than 1000 teachers have participated in an IEEE volunteer led TISP presentation in 2006

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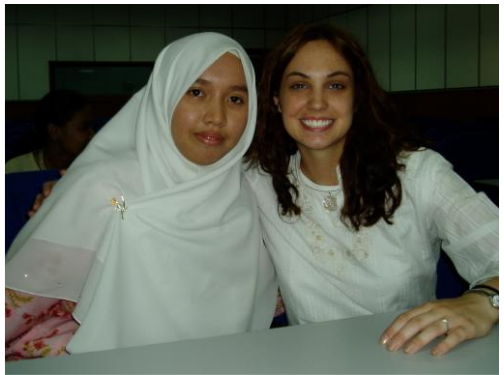
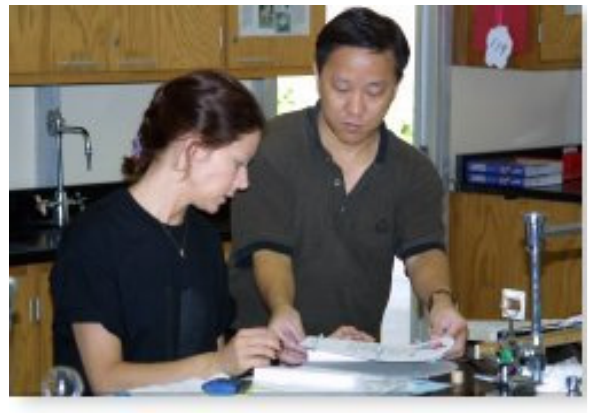
What will we do in 2007?

Region	Place	Date
2	Baltimore	7-8 September
5	Dallas	13-14 July
9	Rio de Janeiro	17-18 August
9	Lima	3-7 August





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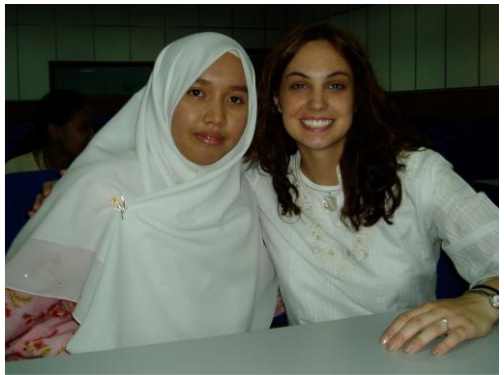
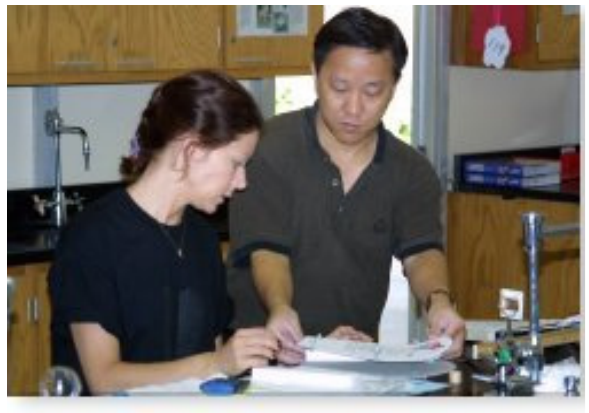


New, Student Branch based model



Training sessions

- A full-scale TISP training for volunteers
- Open to all Sections in a Region or an Area
  - All expenses are paid by IEEE-EAB
- We are looking for volunteers who will follow up and take the activities to the schools
- Now is the time to plan a TISP event in Region 8 in 2008
- The event needs to be planned at least a year in advance by a fully engaged volunteer committee

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CALL FOR ACTION

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Where in R8 should we plan the next TISP session?

- Where under-subscription to engineering programs is a problem
- Where there is a strong group of volunteers who can carry the program for at least 4 years
- Where there is enough interaction and interest of educators and the local school administration

On Line Portal

TryEngineering.org

IEEE

TryEngineering.org

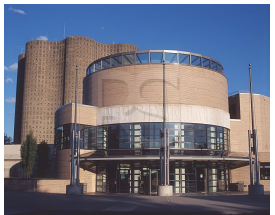
- An on-line portal for students, teachers, school counselors, and parents
  - Educational and entertaining
    - Focused on the audience
- Collaborative effort of IEEE with IBM and the New York Hall of Science
- Our plan is to make TryEnginering.org the premier on-line resource on engineering for pre-university students

IEEE

TryEngineering.org

A portal for students, parents, school counselors and teachers

School search By location, program, environment	**Day in the life of an engineer**
Hands-on and virtual projects	**Class plans for teaching engineering design**
Ask an engineer Brought to you by SAE	**Ask a student** Brought to you by JETS
Games	**Summer camps, internship opportunities**



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Play Games
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Welcome to TryEngineering.org
TryEngineering.org is a resource for students (ages 8-18), their parents, their teachers and their school counselors. This is a portal about engineering and engineering careers, and we hope it will help young people understand better what engineering means, and how an engineering career can be made part of their future. Click here to learn more.
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Unique Features

- School search
- Ask an Engineer
  - Managed by SAE
- Ask a Student
  - Managed by JETS

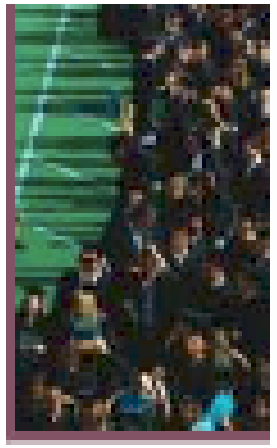
Current Status

- TryEngineering.org is on line
  - Please visit and provide us with feedback
- The site is becoming better known
  - 84000 hits per month, 19200 unique visitors, 3800 university searches, 7500 lesson plan downloads
- The site is now cited widely as the premier resource on engineering education
  - E.g., many referrals from Wikipedia
- Monthly newsletters just added
  - In English and Spanish

In the making…

- New countries were just added to the school search; currently:
  - Australia, Brazil, Canada, France, Germany, India, Japan, Korea, Malaysia, Mexico, New Zealand, Pakistan, UK, USA, South Africa
- Versions in additional languages are in preparation
  - Spanish, French, Japanese, Russian, German, Chinese

Can you spot the problem?



En Canadá, los programas están acreditados por el organismo Canadian Engineering Accreditation Board (Junta Canadiense de Acreditación de Carreras de Ingeniería), establecido por el Canadian Council of Professional Engineers, CCPE (Consejo Canadiense de Ingenieros Profesionales) en 1965 con el objeto de certificar que los programas de ingeniería de pregrado que se ofrecen a los ingenieros aspirantes cumplan los requisitos académicos necesarios para la inscripción como ingeniero profesional en Canadá. Los programas de ciencias informáticas están acreditados por el organismo Canadian Information Processing Society (Sociedad Canadiense de Procesamiento de Información).

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En Estados Unidos, los programas de ingeniería están acreditados por el organisr Inc. con una amplia participación de diversas sociedades de ingeniería. Por ejem de las principales responsabilidades de la Junta de Actividades Educativas del IEE participar en el proceso de acreditación de programas de ingeniería y tecnología

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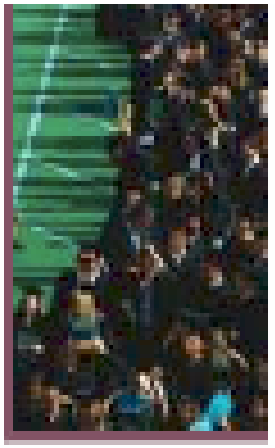

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Can you spot the problem?

How Region 8 can assist…

- Suggest engineers and students for interviews that will be featured on the site
- Get student branches to send stories to the monthly newsletter
  - short essays on student life and perspectives
- Review the Spanish, French, German, Russian and English versions of the site and help us with terms and region-specific material

This was approved by the R8 Committee in October 2006

How Region 8 can assist…

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- Launched October 2006
- Aims to put high-quality material in the hands of pre-university teachers
- Such material already exists on TryEngineering.org

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- We recommend that R8 use TryEngineering.org as the delivery vehicle for the pre-university material it discovers

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Meeting the Growing Demand For Engineers and Their Educators 2010 - 2020 International Summit

Munich, Germany

9 - 11 November 2007

Arthur Winston, General Chair

Objectives and Participants

- An international conference on the growing demand for engineers and their educators
  - and about actions required to meet that demand for engineers and their educators in the period 2010-2020
- Participants
  - Invited representatives from industry, government, and academia
  - Authors of papers and posters
  - Focus on decision makers and policy makers who can steer the educational system at both pre-university and university levels

Keynote Addresses

- An industry perspective on the status of the engineering workforce
- A Pre-university perspective on the status of the supply and demand of pre-university science, technology, engineering and mathematics educators
- The role of academia and professional societies in addressing the development of future engineers and pre-university educators in science, technology, engineering and mathematics

Where are the keynote speakers coming from?

- Industry
  - Major corporations in ECE in Germany and the US
- EU commission on education and training
- IEEE
- Engineering Education
  - President of a school known for excellence in Engineering

Breakout Sessions

- How industry, academia, professional societies and the pre-university education community can work together to address engineering workforce challenge
- How the pre-university education community, industry, academia, and professional societies can work together to address the supply and demand of pre-university science, technology, engineering and mathematics educators
- Identify collaborative strategies to address the issues and develop an action plan

Desired Outcome

- A road map: here is what we need to do to address the key two constituencies
  - "engineering" and "education"
- Best practices: here is what seems to have worked

Important Dates

Action	Date
500 Word Abstract	30 April 2007
Notification of Acceptance	30 May 2007
Registration	1 October 2007
Complete Paper Manuscript	1 October 2007
Summit Date	9-11 November 2007

Who is paying for this?

- Registration fees
- IEEE Educational Activities Board
- IEEE Foundation
- IEEE Life Member Committee
- Sponsors from Industry

- As of 10 April 2008 we are still $80K short of balanced budget

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How did Region 8 participate so far?

- Planning Committee
  - Gerald Anleitner (R8)
  - Victor Fouad Hanna (R8)
  - Dave Janosz (Educator – R1)
  - Moshe Kam (EAB – R2)
  - Fanny Klett (R8)
  - Andreas Luxa (R8)
  - Rolf Remshardt (R8)
  - Rupert Rompel (VDE)
  - Michael Schanz (VDE)
  - Bill Sparkman (Educator – R6)
  - Charles Turner (R8)
  - Douglas Gorham (IEEE Staff)
  - Jessica Czeczuga (IEEE Staff)

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How did Region 8 participate so far?

- Identified themes and topics
- Identified speakers and participants
- Provided contacts to Industry and the EU
- Helped with cooperation with VDE

How can Region 8 be of further help?

- Promote the event
- Encourage decision makers to participate
  - and contribute papers, when appropriate
- Consider financial sponsorship
  - A motion is on the agenda of R8

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Final thoughts on the Munich Summit

- This is the first time an activity of this magnitude is offered by EAB in R8
  - The previous Deans Summits were offered in the US
  - The effect of the Deans Summit reverberated for years
- A success of the Munich summit will be good for the profession and for Region 8
  - The Roadmap is likely to be referred to for many years as a key policy document
- Will be a clear demonstration of IEEE's transnational nature and of R8's influence

University Level Activities

Accreditation

Model Curricula

Women in the Engineering School

Accreditation Outside the United States

Key Activities

- Providing help to accrediting bodies in formation
  - Including training of evaluators
- Providing help to groups that want to start new accrediting bodies
- Education about accreditation

Providing help to accrediting bodies in formation

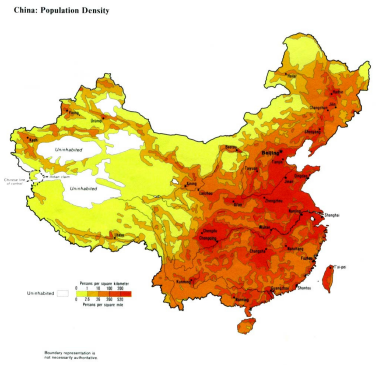
IEEE and accrediting bodies

- Wherever possible IEEE seeks formal status with accrediting bodies
  - Member, observer, advisor

- Wherever a new accrediting body in engineering is formed we offer our help
  - We believe that accreditation is local and regional
  - We want our local members to be leaders in accreditation
  - We do not believe that in the long term accrediting bodies from the US or the UK or Canada should accredit the rest of the world

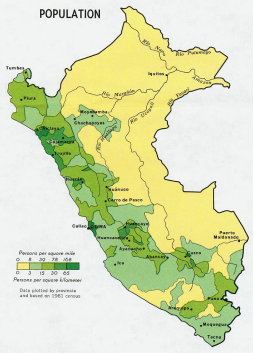
Example 1: IEEE accreditation activities in China

- In 2006 we established an accreditation working group in China
  - Face-to-face meeting in November 2006
- 2007 Activities
  - A committee of the WG will develop a framework for an accreditation pilot in China
  - A workshop on engineering accreditation will be organized in cooperation with Chinese professional associations
    - A translation of ABET accreditation materials into Chinese was completed by EAB



Example 2: IEEE accreditation activities in Peru

- IEEE is providing on-going assistance to the Peruvian accrediting body ICACIT
  - ICACIT was formed in the early 2000s
- In 2006 we have provided the first non-US EAB training for program evaluators in Peru
  - Instructional material developed
- We provided a complete translation of ABET materials into Spanish
  - We are also maintaining a website for ICACIT



Training session for Peruvian program evaluators, December 2006

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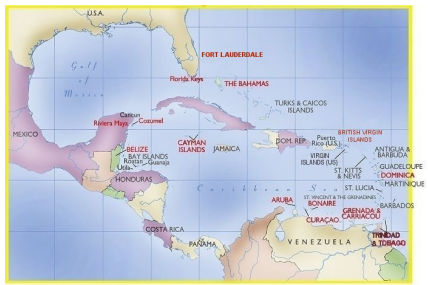
Example 3: IEEE accreditation activities in the Caribbean

- In 2006 we visited the accreditation oversight body in Trinidad and Tobago
  - And the University of West Indies

- In 2007
  - Assistance to the UWI in establishing ABET substantial equivalency status
  - Accreditation workshop and coordination meeting for English language programs in the Caribbean



Who is missing from this picture?

- IEEE Region 8

- Though…
  - There are plans to establish a new European accrediting body
  - Many countries in R8 do not have local accrediting bodies
  - Many countries in R8 do not have local accrediting bodies and do not use other accrediting bodies to review their programs

EAB's actions

- Take inventory of accrediting bodies in R8
  - Document on TryEngineering.org and accreditation.org (new, in preparation)
- Seek opportunities to help local volunteers work with existing or new accrediting bodies

How R8 can be involved

- Help with the inventory of accreditation agencies and new accrediting bodies
- Inform the membership that IEEE seeks involvement in local accreditation
  - This is true even is “it is all done by the government”
- Work with EAB to establish presence of IEEE Sections in local accrediting bodies

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www.accreditation.org

Coming in the Third Quarter of 2007!!

A New IEEE Portal www.accreditation.org

- Tutorials and references on accreditation
- Position papers
- All the internationally recognized accrediting bodies
  - And the programs that they accredited
- All the mutual recognition accords and registries
  - The full text, all signatories
  - What does in mean for you

University-level Education

Model Curricula and Policies

Development of Models and Policies

- IEEE model curriculum in Biomedical Engineering
- IEEE model curriculum in Systems Engineering
- IEEE white paper on Accreditation

How can Region 8 be involved?

- We see no need for Region 8 action in the area of model curricula
  - Educators from R8 are part of the dialog
- When the accreditation white paper is posted on a shared website, we will invite R8 to participate in the discussion
  - The Bologna declaration will play a major role

Women in the Engineering School

IEEE Discovery Based Projects

for First Year Students of Electrical Engineering, Computer Engineering, and Computer Science

IEEE

The problem…

- In most countries women are under-represented in the engineering student body
- While women made significant progress in Medicine and Law they have not increased their participation in Engineering to the same degree
- The dropout rate of women from engineering programs is high

What does the research tell us…

- Women (and many men) tend to become much more enthusiastic about engineering if they see early..,
  - The impact of engineering on society, especially as a humanitarian discipline that increases public welfare
  - They get hands on experience with engineering related projects
    - It is much too late to wait to the last year

IEEE Discovery Based Projects

for First Year Students of Electrical Engineering, Computer Engineering, and Computer Science

- **A new program, intended to develop and distribute projects that educators of Electrical and Computer Engineering (ECE) and Computer Science (CS) can use in the first-year classroom**

Desired Projects

- High quality, hands-on, team-based projects that focus on real-world problems
  - Solutions can be shown to benefit society

- Projects should allow students to discover the importance of contemporary ECE/CS problems and elicit excitement about creative solutions
  - Demonstrate “how” and “why” technical methods work, not merely “recipes”
  - Underlying complex principles and concepts are expected to be made tractable
    - …and provide motivation for further study and engagement

Time Table

Event	Invitation sent	Submission deadline	Response date
Call for abstracts	15 April 2007	31 May 2007	31 July 2007
Invitation to submit a full proposal	31 July 2007	28 September 2007	9 November 2007
Invitation for full implementation of project	9 November 2007	30 May 2008	

How R8 can be involved

- Help EAB promote the program
  - Flyers are available
- Inform education chairs and chairs of university programs that the program has been launched
- Arrange teleconferences with interested parties
  - An EAB representative will always be glad to be on the line

How R8 can be involved

CALL FOR ACTION

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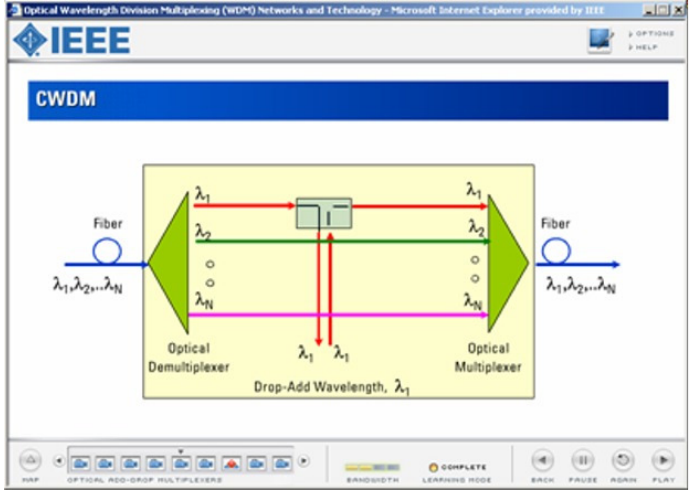
Continuing Education

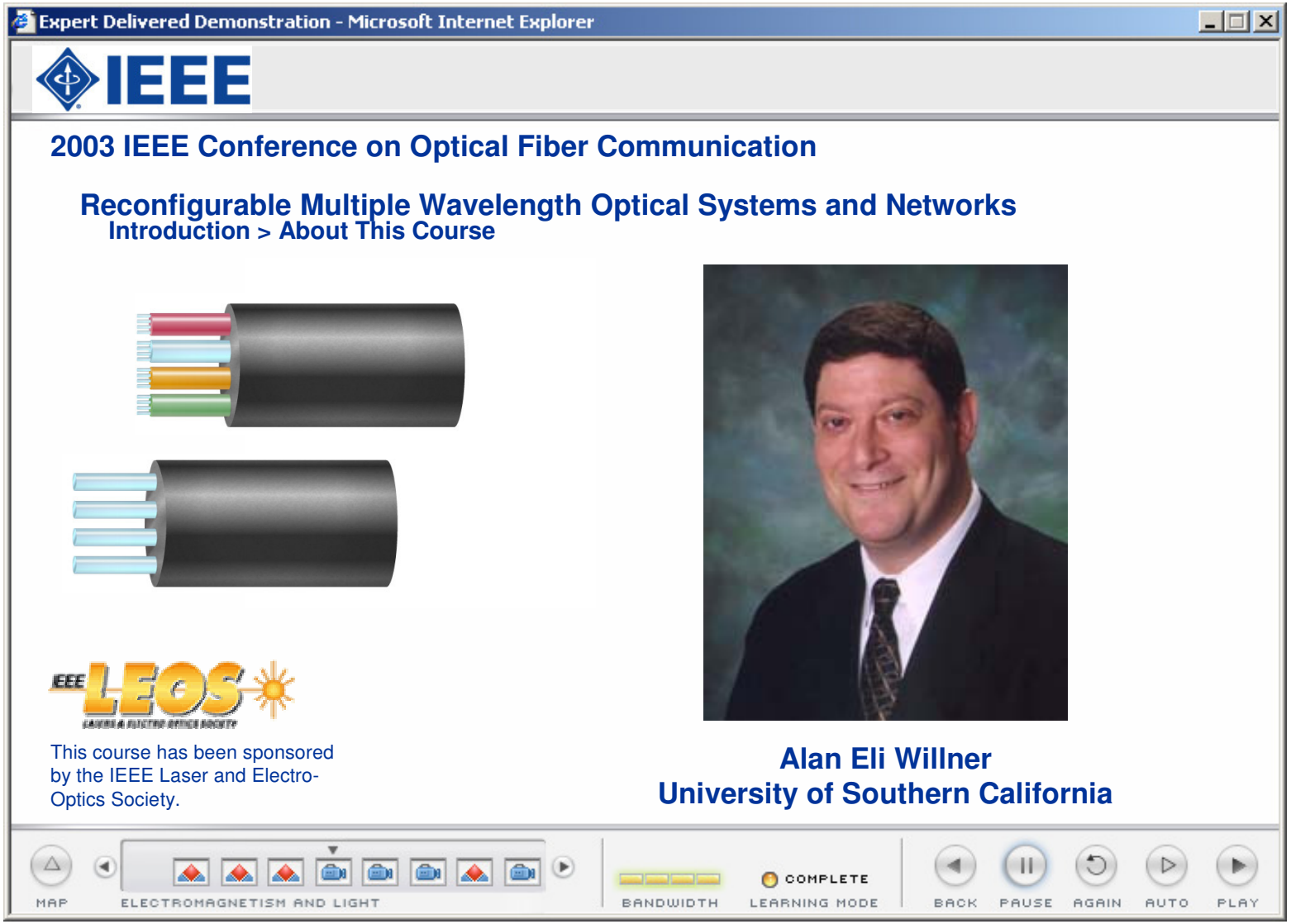
Expert Now IEEE



- The best of IEEE's educational content delivered in one-hour long online learning modules
  - 50 modules are included in the current version
  - By the end of 2007 we will have at least 75

- The latest information on emerging technologies and seminal works
  - presented at the best of IEEE's conference tutorials, short courses and workshops

Optical Fiber Communication



- A master of ceremony approach to introducing the presenter
  - Establishes the presenter as the expert of the content (SME)
  - Begins the presentation in a professional manner
- The course objectives are introduced by the Expert
  - Establish the presence of the expert
  - Establishes the mastery of the content

Selected Titles

SOCIETY	SME	TOPIC
Communications Society	Kai Siwiak	UWB Radio Technology
Computer Society	Dwight Borses	Wireless Sensor Networks
Electron Devices Society	John Cressler	RF Devices & Circuits
Engineering Management Society	Mike Aucoin	Transition to Management
Industry Applications Society	Eric Perrson	Inverter Power Stage Design for Appliance Motor Drives
Lasers & Electro-Optics Society	Ira Jacobs Joe Campbell	Introduction to Fiber Optics Optoelectronic Devices for Fiber Optics
Power Electronics Society	David Middlebrook	Design-Oriented Feedback and Analysis
Reliability Society	Wayne Ellis	Effects of Reliability Mechanisms on VLSI Circuit Functionality
Solid-State Cirucuits	Arya Behzad	Wireless-LAN Radio Design

Expert Now IEEE news

- "Free samples" are available to the membership
  - Three courses currently available on www.ieee.org/education

- The whole library is available for subscription to the membership
  - One course at a time
  - At a considerable discount

How can Region 8 get involved

- Review the available modules and titles
  - Provide feedback
- Use modules in Section and Chapter meetings
  - Module is projected with Q/A and comments by a local expert
  - Successful pilot run in Singapore

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AN ACTION ITEM FOR R8 EDUCATION CHAIR AND COMMITTEE

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Recognition of Leaders in Education

EAB has a successful awards program

www.ieee.org/education

- Meritorious Achievement Award in Accreditation Activities
- Meritorious Achievement Award in Continuing Education
- Meritorious Achievement in Informal Education
-
- Pre-University Educator Award
- Major Educational Innovation Award
- Meritorious Service Citation
- Employer Professional Development Award

- Society/Council/Section Professional Development Award
- Vice President's Recognition Award

A few award recipients from the past…

- Ronald Rohrer
- J. David Irwin
- Les Besser
- Mario Gonzalez
- Richard P. D'Onofrio
- H. Vincent Poor
- Companies: Texas Instruments, Motorola, Turk Elektrik Endustrisi (TEE)

Region 8 and the EAB awards…

- In the last few years there are almost no nominations from Region 8
  - While the number of nominations from all other Regions have gone up
- Possible explanations:
  - Region 8 does not care about education awards
  - Region 8 lags other regions in educational excellence – the talent is simply not in Region 8
  - Region 8 is deficient in getting organized to prepare nominations for awards
- Which one is it?

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CALL FOR ACTION

- Please send in Region 8's nominations

Summary: Ongoing Activities

- TISP
- TryEngineering
- The Munich Summit
  - Meeting the Growing Demand For Engineers and Their Educators 2010 - 2020 International Summit
- Accreditation
- Model Curricula
- Women in the Engineering School
- Expert Now
- Recognizing Leaders in Education

Summary of Calls for Action

Area	Action
TISP	Venues for 2008 in R8
Munich Summit	Promote and participate
TryEngineering	Help with region-specific versions
	Use for pre-university R8 materials
Accreditation	Identify opportunities for IEEE participation
Hands-on projects/WIE	Promote and participate
Expert Now	Use in Section and Chapter activities
Awards	Prepare Nominations

Questions or comments?