IEEE EIT Electro Information Technology Conference, 2001
Oakland University   June 6-8, 2001

June 6, Wednesday

Registration - 2:30 to 7 PM Tutorial: VHDL—Dr. Haskell, 6 to 9 PM - 133 SEB	3 to 5 PM-Lab View Tutorial DH 201

June 7 Thursday

9 to 10 AM Inauguration and Key note Speech by Prof. Hojjat Adeli DH 200		

10:15 AM to 11:45 AM

Session TM 101 Fuzzy Logic DH 201	Session TM 102 Mobile Communication DH202	Session TM 103 E-commerce and Internet DH203

12-1:30 Lunch at Oakland Center: Lunch speech: M. Gopalan "Automotive Digital Product Creation"
1: 45 PM to 3:15 PM

Session TA 201 Automotive Applications DH201	Session TA 202 Vetronics DH 202	Session TA 203 Next Gen Electrical Archit. DH203

3:15 PM to 3:30 PM Coffee Break
3: 30 PM to 5 PM

Session TE 301 Wireless communication DH 201	Session TE 302 Business Applications DH 202	Session TE 303 Real Time Systems DH 203

Dinner at Oakland Center 6 to 9 PM   Speech: "300 years of Detroit"

June 8 Friday

9 to 10 AM Key note Speech by Prof. Benjamin Wah DH 202		

10:15 AM to 11:45 AM

Session FM 401 Neural Network DH 201	Session FM 402 Mobile & Wireless DH 202	Session FM 403 IT Education issues I DH 203

12 to 1:30 PM Lunch at Dodge Hall (Box lunch) Speech: 2) "IT and Manufacturing" Abdallah Shanti

1: 45 PM to 3:15 PM

Session FA 501 Industrial application DH 201	Session FA 502 Application Specific Process DH 202	Session FA 503 IT Education Issues II DH 203

Coffee Break 3:15 PM to 3:30 PM
3: 30 PM to 5 PM

Session FE 601 Industrial application DH 201	Session FE 602 ATIB Applied Tech Business DH 202	Session FE 603 2 Hours Data Mining- Tutorial DH 203

Banquet Dinner at Holiday Inn 6 to 9 PM
Awards:
Speech: "Challenge of Electric-deregulation on IT industry"

IEEE EIT Electro Information Technology Conference, 2001
Oakland University
June 6-8, 2001

SCHEDULE

June 6, Wednesday 6 PM to 9 PM

1. Tutorial on Lab View   3 PM to 5 PM   DH 201
2. Tutorial:
   Dr. Richard Haskell " VHDL Synthesis of a Microprocessor Core for a Xilinx FPGA" Room   133 SEB   6 PM to 9 PM
3. Conference Registration 2:30 PM to 7 PM, Dodge Hall Foyer near Room 200

June 7 Thursday

8 AM to 5 PM – Conference Registration, Dodge Hall Room 200 corridor

9 AM – 10 AM

1. Welcome by conference General Chair Prof. Subra Ganesan.
2. Welcome by IEEE Region 4 director.
3. Inauguration by Bhushan Bhatt, Dean SECS, OU.
4. Introduction of Key Note Speaker Michael Polis.

Key Note Speech: Professor Hojjat Adeli "Wavelets to Enhance Computational Intelligence for Chaotic and Complex Pattern Recognition Problems"

10 AM to 10:15 AM Coffee Break

10:15 AM to 11: 45 AM (Three Parallel sessions)

Session TM 101　　　Fuzzy Logic, Genetic Algorithm and applications

Chair: Daniel M. Litynski　　　　　　　　　　Co- Chair: Hossein Mousavinezhad

1. **Neural Networks for Short Term Load Forecasting in Power System of Montenegro**
   Ervin Spahic, Ilija Vujosevic　　　University of Montenegro, Yugoslavia

2. **Application of Genetic Algorithm to Fuzzy Logic Control of Dissolved Oxygen Concentration in a Waste Water Treatment Plant**
   Ranganath Muthu, Ebrahim M.A Moh'd　　University of Bahrain, State of Bahrain

3. **Neuro Fuzzy Based Load Frequency Controller Using Genetic Algorithm**
   P.Laksmi, Sridhar Musham, S. Renganathan　　M.I.T Campus, Anna University, India

4. **CORTGRASS: Co-Synthesis of Real Time Systems using Genetic Algorithm with Stochastic Scheduling**
   S. Chakraverty　　　Netaji Subhas Inst of Technology, India
   D. Roy Choudhury　　Delhi College of Engg, India
   C.P. Ravi Kumar　　　Indian Inst of Technology, India

5. **Design of Neural Network Controller for Boiler Drum Level using Fuzzy Logic Controller Response**
   Dr.S.Renganathan, Dr.P.Kanagasabapathy, K.Balasubramanian, M.K.Udhaya Kumar
   Anna Univerisity, India

6. **Decentralized Expert Fuzzy Controller Design for a Class of Large Scale Systems**
   Faysal AlAbbas　　Damascus University, Syria

Session TM 102　　　　　　　Mobile Communication

Chair: Charles Thurwachter　　　　　　　　　Co- Chair: S. Vijayarangam

1. **Wireless Internet Access Technologies**
   Bharat B. Madan　　　Old Dominion University, Va

2. **An Architecture for MPLS Implementation in Wireless Networks**
   S. Vijayarangam, S. Ganesan　　Oakland University, MI

3. **Distributed Query Processing via Mobile Agents**
   Sylvanus A.Ehikioya, Quang Trinh　　University of Manitoba, Canada.

4. **Policy based Distributed Network Management employing mobile agents**
   Prof. V.Sankaranarayan　　　Ramanujam Computing Centre, India
   Prof. S.Suresh　　　　　　　Anna University, India

5. **Dyanamic Multiplexing Techniques for Wireless Networks carrying Heterogenous Traffics**

Anthony Burell   Oklahoma State University, Oaklahoma
P.Papantoni-Kazakos   University of Colorado at Denver, Colorado

6. **Cellular Data Services In USA**

Charles Thurwachter   Purdue University

7. **A Mobile Network Architecture on Software Radio and Optical Networks**

Huang Defeng, Zhou Zucheng   Tsinghua University, Beijing

Session TM 103   E-commerce and Internet

Chair: Ron Srodawa   **Co- Chair: Ali Eydgahi**

1. **Multi-Site Internet-Based Tele-Cooperation**

IMAD H. ELHAJJ, J. Tan, N.Xi   Michigan State University East Lansing, MI
W.K. Fung, Y.H. liu   Chinese University of Hong Kong, Shatin, Hong Kong
T.Kaga, y. Hasegawa, T.Fukuda   Nagoya University, Japan

2. **Enabling Global Electronic Commerce with Electronic Broker: e-Broker Architecture**

William Chi Tong   Etrons Systems Dallas, TX
Ali M. Eydgahi   University of Maryland Eastern Princess Anne, MD

3. **Local Number Portability Overview**

Vincent Butler   North Eastern University, Boston

4. **Gigabit Network Research with Washington University Switches, Adapters, and Active Network Components**

Ronald Srodawa   Oakland University, Rochester, MI

5. **Automatic Generation of SCTP Test Cases in Multi service Switching System**

Hyunjeong Lee, Namkyung Uhm, Youngil Choi, Byungsun Lee, Kyungpyo Jun
Network Technology Laboratory, Electronics and telecommunication

6. **A programmable ATM Network Interface Engine**

Ali Elkateeb   University of Michigan, Dearbon

12 Noon to 1:15 PM Lunch at Oakland Center, Gold Room

Lunch Speech: 'Automotive Digital Product Creation'
           Dr. Mukundan Gopalan, Daimler Chrysler Corporation

1:30 to 3 PM (Three Parallel Sessions)

Session TA 201   Automotive Application

Chair: Anson Lee   **Co- Chair: Mukundan Gopalan**

1.   **A resonance Noise Detection and Removal Technique using Resonant and Inverse Filter Banks and its Application in Engine Misfire Detection**
Zhijian James Wu, Anson Lee, Daimler Chrysler

2.   **Computer Modeling of CAN Automotive Bus Transceivers**
Andy Rusek, Barbara Oakley   Oakland University, Rochester, MI
Dan Stevens, Lee Hillier   Daimler Chrysler Corporation

3.   **Intelligent Systems: A Mobile Robot Case Study**
Bruce E. Brendle, Jr.   US Army Tank Automotive Research Development and Engineering Center
Ka.C. Cheok   Oakland University

4.   **Rapid Prototyping of Embedded SH2 Controller for Stabilized Platform**
Ruben De Schipper, Ka.C. Cheok   Oakland University, Rochester, MI
J. Ben Klaassens, G. Edzko Smid.   Technical University of Delft

5.   **Fuzzy Logic Parameters Selection and their influence on the controller performance and stability**
R.P.Sharma, S.Yasin   Western Michigan University, Kalamazoo
Subra Ganesan   Oakland University, Rochester, MI

6.   **A Real Time Control Network Protocol for Embedded Systems Using Controller Area Network**
Larry Seih, Peter Haniak   US Army Tank Automotive Research, Warren, MI
Paul Richardson   University of Michigan, Dearbon, MI

Session TA 202   Vetronics (Vehicle Electronics)

Chair: Rakesh Patel   **Co- Chair: Paul Richardson**

1.   **Vetronics Technology Test bed Battlefield Visualization Technology for Improved Situational Awareness**
Brian M. Novak, Melissa J. Karjala

2.   **An Open-Systems Architecture for Vetronics Applications**
Rakesh Patel   US Army Tank-Automotive Research, Warren, MI
William Prichett, Michael Smith   DCS Corporation, Alexandria, VA

3.   **Digitized Mapping-The Key to information domination on the Battlefield**
Jeffrey F. Jaster   US Army Tank-Automotive Research, Warren, MI

4. **Department of Defense Common Conceptual Framework Model Used in Achieving Interoperability**

Thomas Hosmer   US Army Tank-automotive Research, Warren, MI

5. **Using a Standard Operating Environment to Support Distributed, Object Oriented, real-time Embedded Applications**

Rakesh Patel   US Army Tank-automotive Research Warren, MI
Robert Kling, John Riley   DCS Corporation, Alexandria, VA

6. **Implementing Transient Fault Tolerance in Embedded real-time Systems**

Larry Sieh, Peter Haniak   US Army Tank Automotive Research, Warren MI
Paul Richardson   University of Michigan, Dearbon MI

Session TA 203   Next Generation Vehicle Electrical Architecture

Chair: Pat Dessert   **Co- Chair: Fred Meisterfeld**

1. **Next Generation Vehicle Electronics**

Pat Dessert   Oakland University, Rochester, MI

2. **Smart Battery Development for Automotive Applications**

Henry A Catherino   US Army Tank Automotive Command, Warren, MI

3. **Onboard diagnostics requirement and the impact on vehicle electronics**

Subra Ganesan, Ken Rao   Oakland University, Rochester, MI

3 PM to 3:15 PM – Coffee Break

3:30 to 5 PM (1 Panel Session, 2 paper sessions)

Session TE 301   Wireless communication

Chair: John Metzner,   **Co- Chair: Satwant Kaur**

1. **Convert MPEG2 Player and Server to use APIC Library for Zero-Copy Communication**

Chih-Liang Feng   Oakland University, Rochester, MI

2. **Blind Detection of Modulation Type in the Digital Cellular System EDGE**

I. Dayoub, A. Rivenq, J.M. Rouvaen   University of Valenciennes, Cedex, France

3. **Vector Symbol Decoding with List Inner Symbol Decisions and other Convolutional Codes for Wireless Communication**

Usana Tuntoolavest, John J. Metzner   Pennsylvania State University, PA

4.   **Mobile IP and implementation of regional registration**

     Satwant Kaur, Subra Ganesan   Oakland University, Rochester, MI

5.   **Mobile Management in Distributed Wireless Communication System**

     Yi Wang, Zhaomin, Zhang Zhongpei, Xu Xibin   Tsinghua University, Beijing, China

6.   **Towards a unique Model for Web-Based Information Systems**

     Bruce R. Maxim, Kiumi Akingbehin, Qiang Zhu   University of Michigan, Dearbon, MI

Session TE 302   Information Technology and Business Panel Session.

Moderator: Mohan Tanniru   AtiB, SBA, Oakland University

<u>Panel Participants</u>

Mr. Edward Pettitt   **Delphi Automotive**

Mr. Urlich Herter   **INCAT**

Mr. John Crary   **CIO, Lear**

Dr. Carl McGowan   **SBA, Finance, Oakland University**

Dr. Vijayan Sugumaran   **SBA, MIS, Oakland University**

While both are technology focussed, engineers and IT professionals differ in the way they address problems using technology. There are differences in the way ideas are conceived, requirements defined, products developed, commercial viability established and engineering knowledge managed in engineering and IT disciplines. This session will look first at how some of these differences often contribute to misunderstandings and mis-communication between engineering and IT/business people. It will also touch on how financial and Knowledge management issues have implication for each.

Session TE 303   Real Time Signal Processing Systems

Chair: S. Renganathan   Co- Chair: Sudhakara Rao

1.   **Real Time Classification of Resistance Spot Welds Using Dynamic Resistance Signatures**

     Frank Garza, Manohar Das, Nilanjan R. Chaudhury   Oakland University, Rochester, MI

2.   **A Hardware Approach to Loss-less data Compression**

B.Nagaraja Naidu, R.Srinivasan   Indian Institute of Astrophysics, India

3.   **Wavelets for Compression and its application to Paper Machine Data**

Dr.S.Ranganathan   MIT Campus, Anna University, Chennai, India
B.Sheela Rani   Sathyabama Engineering College, Chennai, India

4.   **Calculating the Rate Distortion Function of a Class of Sources for Digital Signal Processing Applications**

Laurence Wolfe   U.S National Institutes of Health, Maryland

5.   **Real Time Edge Detection implementation**

M.Z.Atashbar, I.Abdel-Qader   Western Michigan University, Kalamazoo
A.Bab-Hadiashar   Swinburne University of Technology, Victoria, Australia

6.   **A DSP based mosaic CCD Camera controller**

B.Nagaraja Naidu, R.Srinivasan   Indian Institute of Astrophysics, Bangalore, India

6 PM to 9 PM   dinner at Oakland Center, gold room
Dinner Speaker:

300 years of Detroit

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June 8 Friday

8 AM to 5 PM – Conference Registration Dodge Hall Room 200 corridor

Key Note Speeches   (9 AM – 10: 15 AM):

Professor Benjamin Wah President, IEEE Computer Society
"Reconstruction-Based Sub-band Image Coding for Transmissions over the Internet"

10:15 AM to 10:30 AM Coffee Break

10:30 AM to 12: 00 noon (Three Parallel sessions)
Session FM 401   Neural Network and applications

Chair: K.C. Cheok   **Co- Chair: Jim Overholt**

1.   Development of a Neural Network Controller for Boiler Drum Level

Dr.S.Renganathan, Dr.P.Kanagasabapathy, K.Balasubramanian, M.K.Udhaya Kumar
MIT Campus, Anna Univerisity, Chennai, India

2   On The Recognition of Hindi Phonemic and Sub-Phonemic Classes Using Time Delay Neural Network

Amita Dev, D Roy Choudhary, S.S Agrawal   CEERI, CSIR Complex, New Delhi, India

3   Handling Singularity in Sensor Fusion using Fuzzy Logic

Ka.C. Cheok   Oakland University, Rochester, MI

4   Fuzzy Clustering Technique for Ground Vehicle Traffic Monitoring Radar

Nicholas Zorka   Ford Science Research Laboratory
Ka.C. Cheok, G. Edzko Smid   Oakland University, Rochester, MI

5   Unscented Kalman Filtering Technique for Training Neural Network

Greg Hudas   US Army Tank Automotive Research Center
Ka.C. Cheok   Oakland University, Rochester, MI

6.   A Reactive Navigation Scheme for an autonomous Skid-Steer Robot using Threshold fuzzy systems

James L. Overholt   US Army Tank Automotive Research Development and Engineering Center
Ka.C. Cheok, G.E. Smid   Oakland University, Rochester, MI

7.   Self Organizing Fuzzy Neural Network

H.S Khafagy   Kingsley, Dearbon, MI
Ka.C. Cheok   Oakland University, Rochester, MI

Session FM 402   Pattern Classification

Chair: Curt Adam   **Co-Chair: Djamel Bouchaffra**

1.   Reducing Artifacts in Coded Images Using Network Aided Adaptive FIR Filter

S.Zhang, E.Salari   University of Toledo Toledo, Ohio

2.   Novel Shape Feature Extraction and Apples Classification Using Computer Vision

P. Sudhakara Rao, Dr. A. Gopal, S. Md. Iqbal   CEERI, CSIR Complex, Chennai, India

3. **Jointed MMSE Detection and Decoding for MC-CDMA**

   Zhang Zhongpei, Wang Yi, Zhou Shidong, Yao yan   Tsinghua University, Beijing, China

4. **Modified System of Complex Impulse Functions for Invariant Image Description**

   Galina I Bahrushina, Alexander P. Bahrushina   Khabarovsk State University of Engineering, Russia

5. **A New Approaches for size determination of apple fruit for Automatic Sorting and Grading**

   P. Sudhakara Rao, Dr. A. Gopal, S. Md. Iqbal   CEERI, CSIR Complex, Chennai, India

6. **Identifying Handwritten Numerals Using a K-Nearest Neighbour Rule**

   Djamel Bouchaffra, Lina Shoshani   Oakland University, Rochester MI

7. **Optical Edge Enhancement Based on Edge patterns and Fuzzy Logic**

   J. Khazaai   Diamler Chrysler, Detroit, MI
   Severance, M.Z. Atashbar   Western Michigan University

Session FM 403   IT Education Issues I
Chair: Andrew Rusek   Co- Chair: Iswar Rattan

1. **IT Infrastructure at Oakland University**

   Gerrard Joswiack, Oakland University, Rochester, MI

2. **Add a Significant Dot to Education-e-Education**

   William Chi Tong   Etrons Systems Inc, Dallas, TX
   Ali M. Eydgahi   University of Maryland Eastern Shore, MD

3. **E-Books: Current and future**

   Yogi Anand   Oakland University, Rochester, MI

4. **Software Tools for Teaching High Frequency Electronics Course**

   A. Rusek, B. Oakley   Oakland University, Rochester, MI

5. **System Courses in Undergraduate Information Technology Curriculum-Issues and Experiences**

   Iswar Rattan   Central Michigan University, MI

6. **Web Based Education**

   Chris Wagner   Oakland University, Rochester, MI

12 Noon to 1:30 PM Lunch at Dodge Hall, Box Lunch

Lunch Speech : IT and Manufacturing **Abdallah Shanti, American Axle Co.**

1:45 to 3:15 PM (Three Parallel Sessions)

Session FA 501   Industrial Applications

Chair: Manohar Das   Co-Chair: Osama Abudayyeh

1. **Accessing Remote Energy Meters Using Software Agents**

   P.E.Sankaranarayanan, Y. Merlin, Chrysolite Singh
   Sathyabama Engineering College, Chennai, India

2. **Information management for contract administration in local government**

   Osama Abudayyeh, Mohammed Al Bataineh   Western Michigan University Kalamazoo
   Dennis Randolph, Alicia Torres   Calhoun County Community Development Marshall MI

3. **An As-Built Information System for Bridge Management**

   Osama Abudayyeh, Hussien Al-Battaineh, Brad Hurley
   Western Michigan University Kalamazoo, MI

4. **Solving Non Linear Electro Magnetic Problems Using Measure Theory**

   M. Said Jalali, K. Ansari, M. Akbarzadeh, M. Gachpazan
   Ferdowsi University Mashhad, Iran

5. **Performance Study of MLP Trained by Error Back-Propagation with Dynamic Tunneling Technique on the Classification of Remotely sensed Satellite Data**

   V.K. Panchal, P.Roychowdhury, S.P Mishra, D.Roychoudhary
   Delhi College of Engineering, University of Delhi, India

6. **Parity Check Matrix for Hamming Code**

   D. Roy Choudhury   Delhi College of Engineering, Delhi, India

7. **Modeling and Prediction of Noise in a one-dimensional Acoustic Duct for Active Noise Cancellation**

   Ananth Krishnan   General Motors Corp., Ypsilanti, MI
   Manohar Das   Oakland University, Rochester, MI

Session FA 502   Application Specific Processors

Chair: Richard E. Haskell   Co- Chair: G.Srinivasan

1. **An Application Specific Top-Down Approach for Developing Automotive Power Semiconductors**

  Z. John Shen University of Michigan, Dearbon, MI

2. **A Methodology for Analysis of Substrate Coupling in VLSI Using a Fast-Convergent Green's Function for Modeling**

  Nasser Masoumi, Safieddin Safavi-Naeini, Mohamed I Elmasry University of Waterloo, Canada

3. **An Elastic Microprocessor Core for XILINX FPGAs**

  Richard E. Haskell, Darrin M. Hanna Oakland University, Rochester, MI

4. **Magneto Electric Composites for Information Storage Technologies**

  G. Srinivasan Physics Department, Oakland University, Rochester, MI

5. **Context Sensitive Analysis of Logic Programs using Call Strings**

  Lunjin Lu Oakland University, Rochester, MI

6. **Embedding an automatic data acquisition system into a Portable Magnetometer Model G-8 16**

  Johnson Asumadu, Y.E. Lam, T.K.Hoe, M.H.Mohammed Western Michigan University, MI

Session FA 503   IT Education Issues II

Chair: Ravi Anand   Co- Chair: Don-Bramlett

1. **Knowledge Management**
  K.Athappilly Western Michigan University, MI

2. **Learn and Play an Innovative way to impart Learning**
  Yogi Anand Oakland University, Rochester, MI

3. **Under Graduate Curricula in Computer Science and Computer Engineering**
  Sarma R. Vishnubhotla, Subra Ganesan Oakland University Rochester, MI

4. **Cardiac Imaging**
  Ravi Anand Siemens

Session FE 603 (Tutorial on Data mining: A Clementine approach, by Dr. Kuriacose Athappilli Western Michigan University) 1:30 to 4:30 PM with Coffee break.

3:15 PM to 3:30 PM – Coffee Break

3:30 to 5:00 PM (1 Panel Session, 1 Paper Session, 1 tutorial)

Session FE 601   Industrial Applications

Chair: R. Srinivasan   Co-Chair: S. Kaliyugavaradan

1.   **A Programmable Temperature Controller based on a Simple High - Resolution resistance-to-time Converter**

   Dr.S.Kaliyugavaradan, D.Arulraj   Madras Institute of Technology, Anna University, Chennai, India

2.   **New Approach to Dome Automation for Optical Telescopes**

   R.Srinivasan, R.Cowsik, Faseehana, A. Krishnan   Indian Institute of Astrophysics, India

3.   **Numerical Solutions of Elliptic Partial Differential Equations using the wavelet-galerkin Method**

   Dr. Kuzman Adzievski, Dr. James A. Anderson, Dr. Daniel Smith
   South Carolina State University, Orangeburg, SC

4.   **Binary Conversion Algorithms for the Implementation of Complex-Radix Numbers**

   Monte P. Tull, Guoping Wang, Murad Ozaydin   University of Oklahoma

5.   **A Limited Vocabulary Text Dictation System for Hindi Speech**

   Amita Dev, D Roy Choudhary, S.S Agrawal   CEERI CSIR Complex, New Delhi, India

6.   **Technical and Managerial Considerations for data warehouse Implementation**

   Reza Khorramshahgol   American University, Washington D.C.

Session FE 602   Applied Technology in Business (ATiB): Presentations

Chair: Mohan Tanniru, School of Business, Oakland University.

Contrast in educational style when industry partnership in involved traditionally. Co-op programs are very popular in many engineering schools to provide students the practical experience they

need while they are in school. In this panel discussion, an alternative style of industry partnership is proposed and contrasted with the co-op and internship styles. Using students that participated in programs of different style, we will highlight how one of the programs that is currently in place in the business school, called Applied Technology in Business, can be made very effective in the students education process.

Session FE 603   Data Mining Tutorial – Clementine Approach

Kuriakose Athappilli   Western Michigan University

6 PM to 9 PM   dinner at Holiday Inn

Awards

Panel Discussion on Electric De-Regulation and IT
Sponsored by Detroit Edison.

Tutorial: VHDL Synthesis of a Microprocessor Core for a Xilinx FPGA (June 6, 6 to 9 PM in room 133 SEB)

In this hands-on tutorial participants will design a stack-based microprocessor core using VHDL and synthesize the design to a Xilinx FPGA. A software program will then be embedded in the FPGA and run on the microprocessor core.

Topics covered in this tutorial:
- VHDL Design using Xilinx Foundation 3.1i.
- Design of a Function Unit.
- VHDL Simulation using Active HDL
- Design of a Register Stack.
- Design of a Single-Cycle Processor
- Microprocessor Instruction Set
- Software Program Example

Schedule: Wednesday, June 6, 2001; Time: 6:00 p.m. – 10:00 p.m.

6:00 p.m.   Introduction to VHDL
                    Xilinx Foundation 3.1i
                    Lab exercise: Multiplexer design; Digilab switches and displays

6:30 p.m.   Design of a Function Unit:
                         Relational Operators, Logical and Shifting Operations, ALU
                    Lab exercise: Simulation using Active HDL

7:00 p.m.   Design of a Register Stack
                    Stack Operation Control Unit
                    Lab exercise: Stack Operations

7:40 p.m.   Break

8:00 p.m.	Design of a Single-Cycle Processor Control Unit, Program ROM, Counter Lab exercise: Testing the Single-Cycle Processor
8:30 p.m.	Microprocessor Instruction Set Program Counter, Return Stack, Branching Instructions, Subroutine Calls Lab exercise: Microprocessor Core Simulation
9:00 p.m.	Software Program Example Compiling Programs to VHDL, Special I/O Instructions Lab exercis e: Running Programs in the FPGA Microprocessor Core
9:30 p.m.	Conclusion and Wrap-up

Tutorial Instructors:

Richard E. Haskell is Professor of Engineering in the Department of Computer Science and Engineering at Oakland University. He is the author of 15 books and has taught undergraduate and graduate courses in embedded systems and VHDL design using FPGAs.

Darrin M. Hanna is President of Technology Integration Group Services (TIGS, Inc.) and a Lecturer in the Department of Computer Science and Engineering at Oakland University. He has taught courses in digital design using VHDL.