METROCON '93

"Competing in a Changing Market"

Saturday, 13 February 1993
Automation & Robotics Research Institute (ARRI)

PROGRAM

Theodora Saunders, Chairman, Metrocon '93

This year, Metrocon will focus on the technologies and techniques that will help you to survive in our rapidly changing environment. It will explore the issues associated with changing technologies, declining defense budgets, the changing marketplace and its effect on our jobs, and the need for life-long learning.

8:30	REGISTRATION			
9:00	*Auditorium* SHORT COURSE Object Oriented Programming with C++ ** New and Improved ** *(Part I)*	*Room 205* COMPETITIVE TECHNOLOGIES FOR THE 90'S • Future Challenges to Electrical Engineers • • Visual Systems for Flight Simulation	*Room 323* INTEGRATED PRODUCT DEVELOPMENT (IPD) • F-22 Integrated Product Development/Integrated Product Technology Process • F-16 Mid-Life Update IPD . . . One Program's Approach	
10:15	BREAK			
10:30	*Auditorium* SHORT COURSE Object Oriented Programming with C++ ** New and Improved ** *(Part II)*	*Room 205* EDUCATION IS THE KEY TO STAYING COMPETITIVE • The University's Perspective • The Employer's Perspective	*Room 323* PRODUCTIVITY TOOLS AND NEW ENVIRONMENTS • ISO-9000 • IDEF (Integrated Computer-Aided Manufacturing Definition Method) • Expert Systems for Nuclear & Fossil Power Plants	*Room 202* STUDENT PAPER CONTEST • Justifying Cache Menories for Data Flow Architectures • An Object-Oriented Genetic Algorithm Research Tool
11:45	BREAK/LUNCH			
12:00	*Auditorium* KEYNOTE ADDRESS The Power of Engineering: The Social, Economic, and Political Consequences of What Engineers Do			

KEYNOTE **The Power of Engineering: The Social, Economic, and Political Consequences of What Engineers Do** *Auditorium*

Dr. Lloyd J. Dumas, Professor of Political Economy, UTD

Dr. Dumas is well-renowned for his work on the economics of military spending. He recently served as the Vice-Chairman of the Governor's Task Force on Economic Transition. Today, he will discuss with us the role of engineers in society, and present a brief version of his analysis connecting the post World War II deployment of the nation's engineering talent to the decline of U.S. industrial competitiveness.

Dr. Dumas holds degrees in engineering and mathematics, as well as economics. He is published throughout the world in many book, journals and magazines. He is the author of *The Overburdened Economy: Uncovering the Causes of Chronic Unemployment* and editor/co-author of *Making Peace Possible: The Promise of Economic Conversion* and *Reversing Economic Decay: The Political Economy of Arms Reduction.*

Sponsored by:
Fort Worth Section

SHORT COURSE *Auditorium*

Object Oriented Programming with C++ ** New & Improved **

Dr. Tom Nute, Assoc. Professor of Computer Science, TCU

We are pleased to be able to bring back Dr. Nute to present you with the "new and improved" version of his short course on C++. Object Oriented Programming with C++ will provide the attendee with an overview of object oriented concepts and advantages, using the C++ programming language and sample program fragments.

COMPETITIVE TECHNOLOGIES FOR THE 90's *Rm. 205*

Future Challenges to Electrical Engineers

Dr. Robert Mitchell, Chairman, Electrical Engineering Dept., UTA

The world is changing very fast around us. What will electrical engineers be doing in the future? Are you prepared for the next Century? This talk will address what subjects are hot at UTA and what appear to be the directions that EE is taking and what you can do to keep up.

Intelligent Control and Manufacturing

Dr. F. L. Lewis, Professor, Automation & Robotics Research Institute, UTA

This presentation will explore some new ideas in systems and control theory, including "Intelligent Control" -- self-learning neural net controllers, fuzzy control systems, and discrete event controllers. It will also give some applications of control theory in manufacturing, including inventory control, material requirements planning, and intelligent material handling.

Visual Systems for Flight Simulation

Dr. Venkat Devarajan, Assoc. Professor of Electrical Engineering, UTA

This presentation will introduce the basic concept of visual systems for pilot/sensor trainers and will discuss in more detail the various components and accompanying technical challenges. A video tape presentation will illustrate the output of several visual systems.

INTEGRATED PRODUCT DEVELOPMENT (IPD) *Rm. 323*

F-22 Integrated Product Development/Integrated Product Technology Process

Juan Sandoval, Deputy Director of F-22 Engineering, General Dynamics

F-16 Mid-Life Update Integrated Product Development . . . One Program's Approach

John Engels, Product Verification Team Leader, General Dynamics

---

EDUCATION IS THE KEY TO STAYING COMPETITIVE *Rm. 205*

How important is continuing education? It should be a high priority for both the university and your employer. But how supportive are they really? This session will bring the theme of competitiveness to a personal level by discussing the importance of life-long learning for engineers. The two presentations will address the issue from both the university's and the employer's point of view. Here's your opportunity to question them together.

Dr. Harold Sobol, Assoc. Dean of Engineering Research, UTA

Dr. David Sundstrom, Director of Avionics Systems, General Dynamics

PRODUCTIVITY TOOLS AND NEW ENVIRONMENTS *Rm. 323*

ISO-9000

Douglas Kingman, Manager, Cap Gemini America

The ISO 9000 series embodies comprehensive quality management concepts and guidance, together with several models for external quality assurance requirements. The focus of this presentation will be what ISO 9000 is, where it is applicable, and how certification can be achieved. The use of IDEF) as a process modeling technique will be presented as an ideal tool for achieving and maintaining certification.

IDEF

Douglas Kingman, Manager, Cap Gemini America

IDEF - Integrated Computer-Aided Manufacturing Definition Method or, more recently, Integration Definition Method is a structured modeling, analysis, and design technique for enterprise improvement. It presents, through text and graphics, a picture of the interrelationships between parts of any system in a manner that allows individuals with varying backgrounds to understand the total system and the effect of changes on the system.

Expert Systems for Nuclear and Fossil Power Plants

Bai K. Blyden, Lead Senior Engineer, ABB Impell

STUDENT PAPER CONTEST *Rm. 202*

Justifying Cache Memories for Data Flow Architectures

Ponnarasu Shanmugam and Shirish Andhare, Computer Science Engineering, UTA

This paper explores the effect of introducing instruction and operand caches into the Monsoon architecture. The results of our simulation study indicate that spatial and temporal localities can be exploited even in a data flow environment and that a cache subsystem is indeed beneficial.

An Object-Oriented Genetic Algorithm Research Tool

Jennifer Dunning, Computer Science, TCU

The goal of this project was to create a tool for research in the field of optimization using genetic algorithms. Genetic algorithms are claimed to be superior to the gradient search method, which neither works for discontinuous functions, nor performs well on functions with multiple extrema. The application was designed and implemented using object-oriented techniques. A test plan was designed on the basis of Davis' step-by-step development of an optimal performance genetic algorithm. The test results were documented for each intermediate step using performance graphs.