



CAST

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Table of Contents

Editorial Notes

About This Issue, Karl D. Schnelle and Peter R. Rony	3
We Need Your E-Mail Address, Karl D. Schnelle	3

Articles

ProcessCity.com Takes off, by Su Ahmad	4
A Visit to ProcessCity.com: Thirty-Three Discussion Forums, by Peter Rony	8
What is the Internet Paradigm, by Einar (Stef) Stefferud	16

Communications

Larry Biegler is selected as the CAST 2000 Computing-in-Chemical-Engineering Award Recipient, by Peter Rony	18
John Ayala is selected as the CAST 2000 Computing Practice Award Recipient, by John T. Baldwin	19
Mayuresh V. Kothare wins the Ted Petersen Student Paper Award for 2000, by Peter Rony	20
How to Contact the AIChE	23
CAST10 E-Mail List	23

Meetings, Conferences, Congresses, and Workshops	24
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Up-To-Date Meetings are now listed at www.castdiv.org

Advertisements

ProcessCity.com	7
Superpro, Intelligen, Inc.	17
CAST Communications Advertising Policy	20
Turn-Key Training, ControlStation	22
Join the CAST Division of AIChE.	25
2001 Award Nomination Form.	26

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EDITORIAL NOTES

About This Issue

By Karl D. Schnelle (kschnelle@dowagro.com) and Peter R. Rony (rony@vt.edu)

In the last issue, we talked about how the Internet will change the manner in which higher education will be conducted in the near future. So in the Fall 2000 newsletter, we want to switch to a process industry view of these changes. In fact, one change has already happened, as process-oriented *Internet portals* are already on-line. One such website is discussed in this issue in "ProcessCity.com Takes Off" by Su Ahmad, and in "A Visit to ProcessCity.com: Thirty-Three Discussion Forums", by the Editor. Any CAST member who has visited this site or any other "computer and systems technology" portal is invited to email their comments or reviews to the Editors. We would be happy to receive news and reviews of other portals. For instance, what do you think about MyPlant.com, an e-business venture of Honeywell? Do you have any tips for use, or has anyone found useful information from these new types of knowledge sources? Please give us your feedback.

A significant portion of this newsletter is devoted to Aspen Technology's ProcessCity.com portal. Their discussion forums provide, in principle, a wonderful, new opportunity to include recently graduated chemical engineers into our profession. We hope that chemical engineering faculty and CPI managers will encourage young engineers to take advantage of, and participate in, these types of forums.

Also in this issue, it is that time of year again to pay tribute to the accomplishments of our 2000 CAST award winners: Prof. Larry Biegler received the Computing in Chemical Engineering Award, John Ayala was awarded the Computing Practice Award, and Dr. Mayuresh Kothare received the Ted Petersen Award. Be sure to fill out a nomination form for 2001, which can be found in the back of the newsletter. We have provided lengthy stories about our three award winners to educate those readers who want to learn about significant achievements in our field.

To kick *CAST Communications* itself into the Internet age, we are moving some sections on-line exclusively. For this reason, this issue may seem a bit thinner than usual. To eliminate 1/3 of the bulk, the "Meetings, Conferences, Congresses, and Workshops" section is now only on-line at www.castdiv.org. The advantages are reduced postage costs, "near real-time" updates of meetings and conferences, and live links to all the websites so that the meetings are "only a click away". Furthermore, we have posted a presentation by Einar Stefferud on the website; a short introduction is included in this issue.

We Need Your E-Mail Address

By Karl D. Schnelle (kschnelle@dowagro.com)

This is the first issue of *CAST Communications* that is distributed concurrently in print and on-line. One of the reasons that we are hesitating to publish solely on www.castdiv.org is that 25% of our members have not supplied their e-mail addresses to AIChE. So that one does not have to check the website every week for the next issue, the Editors would like to send an e-mail announcement whenever a new issue is published, but we also do not want to miss a significant percentage of our readers.

So if you are in that 25%, please proceed to www.aiche.org/membership/community.htm and register for the **AIChE On-Line Community**. Select [Click Here to Register Now!](#), if you have not already done so. You'll need your unique AIChE membership number handy. Call 800-AIChemE (800-242-4363) if you've forgotten it. Then select [Member Directory](#) and [View/Update Your Online Directory Listing](#). In this way, AIChE and CAST will have your up-to-date e-mail address. Then twice a year, we will e-mail you as soon as the new issue is available on-line.

For those curious people, here is the current year 2000 breakdown (%) by top level domain name (7% were **other**):

C	E	N	C	J	K	O	G
O	D	E	A	P	R	R	O
M	U	T				G	V
59	19	7	2	2	1	1	1

The CAST10 e-mail list has a new address.
See page 23.

ARTICLES



ProcessCity.com Takes Off!

By Su Ahmad, VP, Internet Business Group,
ProcessCity, Aspen Technology, Inc.

Even before Internet browsers became commonplace, chemical engineers and others in the process industries have wanted an online place to meet, share ideas, search for information, gain access to a variety of engineering tools,

communicate with industry experts, and look for new directions in their career. Now, such a community exists: a place for all individuals in or related to the processing industry, from engineers to students and CEOs, a virtual community of people with similar interests and business challenges.

ProcessCity.com is a collaborative Internet portal for process industry professionals. It provides engineers information and technical tools including: industry-specific news and events, professional discussion forums, online engineering applications, career guidance and employment information, company profiles, consultant and solution-provider expertise.

http://www.processcity.com/ Microsoft Internet Explorer
File Edit View Favorites Tools Help

Welcome Home About Site Map Log On Contact Us Tuesday, June 27th, 2000

Web Enabling the Process Industries

News & Events

14.10.01 [WasteMasters, Inc. Continues to Develop Plan to Clean Coal Sites](#)

14.17.01 [LATIN AMERICAN FINANCIAL PRESS SUMMARY FOR JUNE 27](#)

14.11.01 [Pima! Receives Approval From Nortel Networks For Its Customer Relationship Management Solution Pima!s Outfront CRM™ is Designated as a Nortel Networks Compatible Product](#)

13.01.01 [OMNOVA Solutions Joint Venture Acquires Decorative Products Business in China](#)
[Home and Industry Specific Industries](#)

ProcessCity Latest Top Pick

In News & Events
Read the latest process industry news and analysis provided daily by ARC Advisory Group, a leading international management consulting firm.

In Workplace
Online Tools Available
Use Aspen WebProperties Express™ to easily calculate pure component properties. Use demonstrations of Aspen Plus® and Polymers Plus® from AspenTech. Take a test run of Icarus WebEstimator™, the tool to estimate project and equipment costs online, using the industry leading ICARUS Ibase Technology.

In Discussion Room
Ongoing **Production Management** discussion. Add your thoughts on production personnel management, Goldratt's Theory of Constraints, or adopting new technology in the processing industry.

In Career Center
View dozens of on-line career sites with thousands of job listings specific to the process industries

In Marketplace
ChemDraw Pro 5.0
The most popular chemical drawing package in the world, boosts your productivity even more with the new

Chart View: 1 Month
Get Quote: Symbol Lookup

http://files.stockpoint.com/ProcCity/133story.asp?Mode=45&story=20000627/173p7901.htm

ProcessCity is not just for engineers or technologists, but all individuals related to the process industries. If you are in planning, marketing, or project management in the process industries ProcessCity has relevant industry material and expertise that can help you get your work done. If you are a student or just starting out in your career, you can network and make contacts online. Whether you think of ProcessCity as a knowledge-sharing hub or a ‘digital dashboard’, there is always something of value brought directly to you at your desktop. Launched this past February, ProcessCity is sponsored by AspenTech and leverages its position in the process industry with deep process knowledge, chemical engineering expertise, proven integrated solutions and key customer and business relationships. The site is not AspenTech centric; it is a neutral site open to all companies and individuals regardless of their affiliation. There is no cost for users to join or use ProcessCity. The site already has thousands of unique users and dozens of solution provider and consultant listings. Visitors to ProcessCity

can access an extensive events directory tailored to the needs of process industry professionals.

A key differentiator for the site is its discussion forum section, where well known industry experts moderate discussions. ProcessCity currently has over 25 active discussions forums led by industry experts and recently launched “private” discussion areas where confidential dialogue can take place amongst user groups. There is a powerful and vital role for professors and researchers to play on ProcessCity. They are the highly talented experts, luminaries, and forward-thinking individuals that are the intellectual “glue” holding together professional communities. Industry professionals and students alike look to them for expertise, advice and for setting new directions in the industry. Similarly, business leaders will be much sought on ProcessCity for their insights into the “real-world” workings of the industry and where they believe fortunes will be made and lost.



There are some tremendous plans already in progress for the future direction of ProcessCity, which will be launched in the early fall. Planned enhancements include personalized capabilities, a significantly expanded marketplace providing software models and other technology, as well as, offering some tools on an ASP basis, and further expansion of “private” discussion groups.

We invite all of you to come and join us in this online community, to make the most of the tools and resources available and contribute to make it a richer place to experience the process industries.

Solution-providers, consultants, and experts can join online at www.processcity.com, by going to the “Workplace” section and selecting the “Add Resources” option.

Don't forget to look at **your** website,
www.castdiv.org.

The screenshot shows the ProcessCity.com website in Microsoft Internet Explorer. The browser's address bar displays "http://www.processcity.com/". The website has a navigation menu on the left with options like "News & Events", "Workplace", "Discussion Room", "Career Center", "Marketplace", and "Wave Newsletter". The main content area is titled "Workplace" and includes a quote from Herbert G. Blecker, President and CEO of ICARUS Corporation. Below the quote are sections for "Technical Articles" (listing items like "Steady State Simulation" and "Aspen Web Properties Express"), "Process Industry Events" (listing events like "7th International Symposium on Process Systems Eng" and "8th Annual National Minerals Education Conference"), and "Articles of Interest" (highlighting "TODAY'S REFINERY" with sub-sections for "Pipelines & Terminals" and "Moving Gulf Coast Economics Inland"). There are also links for "Read entire article" and "Download Word document". The footer contains the text: "This site is sponsored by AspenTech. Copyright © 2000 Aspen Technology, Inc. All Rights Reserved. Privacy Statement Terms and Conditions".



Work Better, Faster, Smarter . . .

ProcessCity.com--the Internet portal that helps process industry professionals process the power of the Internet by providing direct access to best-in-class technology, expertise and solutions.

Sometimes it's the simple things that make your job easier. Like knowing where to go to get answers and advice that you need. That's where ProcessCity.com can help. Visit today and see how ProcessCity will help you work better, faster, and smarter.

News & Events

Keep up to date with in-depth industry news and events.

Read the latest process industry news and analysis provided daily by ARC Advisory Group, a leading international management consulting firm.

Workplace

Collaborate with others and solve daily and unexpected problems through the use of online tools, access to consulting services, and research materials.

Use Aspen WebProperties Express™ to calculate pure component properties. Use demo versions of Aspen Plus® and Polymers Plus® from AspenTech. Take a test run of ICARUS WebEstimator™, the tool to estimate project and equipment costs online, using the industry leading ICARUS Kbase Technology.



Collaborate and exchange ideas with leading experts.

Discussions are now ongoing in 28 business, career, and technical areas. An expert in the field moderates each discussion group.

Career Center

Find or fill a challenging position and gain access to career planning tools.

ProcessCity has brought together dozens of online career sites with thousands of job listings specific to the process industries.

Marketplace

Shop for software, services, solutions, and books.

Two current best-sellers: ChemDraw Pro 5.0 - CambridgeSoft's popular chemical drawing package and the latest book from Trevor A. Kletz - "What Went Wrong? Case Histories of Process Plant Disasters."

Consultants: Add Your Company to the ProcessCity Directory for Free!

The ProcessCity Resources community is open to all companies and individuals regardless of their affiliation. Solution providers, consultants, and experts can sign up online at www.processcity.com, by selecting the "Add resources" option in the "Workplace" section. ProcessCity will make your offerings more visible and valuable by promoting and delivering them over the Internet.

Join now!

Join ProcessCity.com today and we'll send you a ProcessCity gift to welcome you to the community: just select code CAST-700 when you register online.

1-617-949-1005 info@processcity.com

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A Visit to ProcessCity.com: Thirty-three Discussion Forums

By Peter Rony

Once introduced to the website, www.processcity.com, we decided to visit the site and to explore its features. On the home page, the left-hand frame provided six main choices:

- ▶ **News & Events**
- ▶ **Workplace**
- ▼ **Discussion Room**
 - [Discussion Home](#)
 - [Business Forums](#)
 - [Career Forums](#)
 - [Technical Forums](#)
- ▶ **Career Center**
- ▶ **Marketplace**
- ▶ **Wave Newsletter**

We decided to visit the Discussion Room, clicked on the selection, and encountered four additional choices -- [Discussion Home](#), four [Business Forums](#), one [Career Forum](#), and twenty-eight [Technical Forums](#). The Discussion Home page is shown in Figure 2 in the companion "ProcessCity.com Takes Off" in this issue. We clicked on Technical Forums, which contained information about the technical topics available as of August 7, 2000:

ALL TECHNICAL TOPICS

Advanced Process Control
Computational Fluid Dynamics
Computing & Information Technology
Custom Modeling Using PC Applications
Dynamic Modeling & Operator Training
Environmental Technology Issues
General Technical Discussion Forum
Kinetics, Catalysis & Reactor Design
Knowledge Management
Molecular Modeling
Neural Net & Related Topics
Numerical Methods and Optimization
Open Standards for Technical Data Exchange
Software Interoperability
Plant Engineering & Design
Polymer Technology
Process Engineering & Design
Process Instrumentation & Control
Process Modeling & Simulation
Process Monitoring and Data Analysis
Process Safety & Reliability
Process Synthesis & Process Integration

Product R&D
Production Management
Production Planning & Scheduling
Separations Technology
Supply Chain Technology
Thermodynamics & Physical Properties

A more detailed description of these forums follows.

Forum Name: Advanced Process Control

Moderator: Frank Doyle

The aim of this discussion forum is to promote a dialogue amongst industrial engineers, vendors, and academic researchers in the broad area of advanced process control. For the purposes of this discussion forum, we consider advanced control to consist of strategies and algorithms applied at the level above the basic regulatory control system. As such, it would naturally include model-based schemes (e.g., model predictive control), as well as nonlinear control, and optimization-based strategies. Application oriented discussion is encouraged, ranging from single unit control designs to plant-wide control.

The discussion topics that are encouraged in this forum include, but are not limited to:

Large-scale issues in model-based control design
Benchmark control studies
Nonlinear versus linear model-based control;
Extensions of basic MPC algorithm
Control-relevant process model development
Novel applications of advanced control in biosystems
Controller performance monitoring
Integration of control with fault diagnosis
Integration of control with planning/scheduling
Issues in batch-to-batch control

Forum Name: Computational Fluid Dynamics

Moderator: Richard Farmer

Co-Moderator: Andy Hrymak

The purpose of the computational fluid dynamics (CFD) forum is to expedite the application of CFD to chemical process analysis by identifying current capabilities and future research needs. The spectacular success of computational aerodynamics deceived CFD specialists into optimistically believing that all transport phenomena problems could be solved numerically. However, due to the wide diversity of flow problems within the process industries, a realistic assessment of current CFD methodology can only be made with respect to specific applications and individual needs. Opinions and suggestions are sought for guiding our discussion in such a way as to avoid becoming mired in the multitude of valuable CFD analyses which have already been made.

The major benefit of CFD is avoiding geometry and temporal simplifications when representing physical phenomena. Our challenge is to provide the thermodynamic, chemical reaction, turbulence, multi-phase, and rheological submodels to utilize CFD for process analysis. Existing solution algorithm availability and computer capability are excellent and will only improve. While some participants are interested in improving the methodology, others will simply wish to utilize what is already available. Our discussions should address both of these interests.

Forum Name: Computing & Information Technology
Moderator: Mike White

The goal of the Computing & Information Technology Discussion Forum is to provide a frank, controversial and open exchange about the technologies, products, companies and people that will enable the next generation business models. Software technologies are moving at a rapid pace and at the same time the technical choices for executing business strategies are expanding. As the internet emerges as a key enabler of business communities and changes customer/supplier roles one of the greatest challenges will be to map clearly defined e-business strategy to e-commerce software execution. The Computing & Information Technology Discussion Forum will allow participants to explore the future relevance of these technologies. The key element of success for all companies is choosing technologies that will survive.

Forum Name: Custom Modeling Using PC Applications
Moderator: Lee Partin

Our mission is to share techniques for easily creating customized models in the chemical industries. Engineers and scientists often need to understand processes or products in R&D, engineering, manufacturing or marketing arenas. PC software is commonly applied. There are several software options for this purpose such as flowsheet simulators, spreadsheets, mathematical software, statistical packages and compilers. Often, the engineer or scientist must customize the software or link software together to obtain the desired calculations. Some examples include:

Adding new functionality to Microsoft Excel such as data smoothing or the integration of reaction kinetics. Applying the capabilities of a mathematical package like MathSoft's Mathcad to quickly implement the calculations of a journal article.

Using a symbolic math program such as Maple to complete a research task most efficiently. Combining the numerical capabilities of Fortran with an Excel spreadsheet or VB user interface.

Please join us as we assist each other with finding the best methods of quickly modeling a wide variety of tasks.

Forum Name: Dynamic Modeling & Operator Training
Moderator: Graham Griffiths

The mission of the Process City Dynamic Modeling and Operator Training discussion group is to provide a creative forum for professionals to discuss a wide range of technology and business issues relevant to this subject area. Typically, we would expect topics to include:

Dynamic modeling - algorithms and analysis
General solution Methods/Techniques
Sequential Modular v Equation Oriented approach
Communications
Interfaces to Control Systems
General software issues
Instructor interfaces and tools
Engineer interfaces and tools
Integration with other technologies
Project management
Operator/Instructor Training courses
Cost estimation, ...

The idea is to encompass all aspects of the subject, not just leading edge topics. Contributors should feel able to freely explore ideas with their colleagues and to seek solutions or assistance to particular problems that they have. This forum is intended to address the needs of practicing engineers, academics, students, managers, business development people and others interested in this area. Please feel free to make suggestions and/or recommendations for improvements as to how the forum is conducted.

This forum will only be as good as the contributions that get posted - good questions stimulate good answers. So, if you need to know something about Dynamic Modeling or Operator Training, this is your chance to ask the professionals. Don't delay, post your question now.

Forum Name: Environmental Technology Issues
Moderator: Gary Bennett

The environmental field offers a plethora of interesting (and often controversial) topics for discussion, i.e., global warming, acid precipitation, etc. As interesting as these topics are, I would prefer to limit this site to a discussion of environmental (pollution control) methods, opportunities and successes. Several examples of questions I suggest for discussion are listed below:

What are the potential control and removal methods for MTBE in groundwater?
How can mercury be removed from flue gasses?
What is new in Brownfield Remediation?
What do you suggest be included in the Superfund Revisions?

Forum Name: General Technical Discussion Forum**Moderator: Open Community**

This is an unmoderated open area for anyone to start discussions around technical topics, as contrasted to business or career topics. These could include engineering questions, health and environmental controls, information technology in the process industries, new developments with specific types of equipment, instrumentation and control issues, or any other technical or technology-related topic. This forum is open to all questions or ideas related to technical topics, not just leading edge topics. Contributors should feel able to freely explore ideas with their colleagues and to seek solutions or assistance to particular problems that they have.

Forum Name: Kinetics, Catalysis & Reactor Design**Moderator: Scott Fogler**

The purpose of this discussion forum is to exchange information on chemical reaction engineering. The exchange will include, but not be limited to:

Professional needs
Educational pedagogy on the teaching of reaction engineering
Collection of websites that have databases and information on kinetics
Discussions on future directions of reaction engineering
Technical questions on reaction engineering
Novel examples of reaction engineering
Standalone lessons and exercises on chemical reaction engineering

Forum Name: Knowledge Management**Moderator: Karl Wiig**

The Knowledge Management Discussion Forum provides an environment to explore and present workable and business-valuable approaches to managing knowledge and other manifestations of Intellectual Capital (IC). The premise is that enterprise performance is a direct result of the quality of personal and structural knowledge and the effectiveness by which it is leveraged. Consequently, explicit and systematic Knowledge Management (KM) has become a management initiative in many organizations although knowledge has always been managed implicitly where people have worked together.

The forum will address general questions such as the ones outlined below but will particularly encourage discussion of more specific topics as well. It is anticipated that the forum will serve two purposes:

Discussion of how KM in whole and in parts can be pursued effectively under different conditions
Exploration of how KM best can serve enterprise objectives

Many questions arise when explicit and systematic KM is considered and might be pursued in the KM Discussion Forum. General examples include:

How do we become more successful through adopting KM?
How are business objectives supported by different KM approaches?
Which practical KM approaches work?
What types infrastructure supports (such as IT support) are effective?
How should KM be managed and governed?
Which methods exist to obtain feedback on the effectiveness of KM?
What are workable KM implementation programs?
How should KM activities be matched to how people use knowledge in work?
How can we assess the value of our Intellectual Capital?

Forum Name: Molecular Modeling**Moderator: Peter Cummings****Moderator: Phillip Westmoreland**

The Molecular Modeling Discussion Forum is intended to aid the science, applications, and infrastructure issues of putting molecular modeling to use in processes. Reactant, intermediate, and product properties are of obvious value, but in process development, qualitative trends can be as well. These results are of interest in product and process design, in interpretation of analytical data, and in developing and protecting intellectual property.

The range of questions and resources of interest is broad, encompassing:

Technical questions by specialists and non-specialists
Strategic and management questions common to both groups
Issues in molecular simulations, quantum chemistry, and their hybrids
Commercial, government, and academic modeling codes
Computing platform and operating systems
Interfaces with information technologies, e.g. Combinatorial methods QSAR/QSPR High-throughput screening Bio and chemoinformatics
Information about meetings and resources of interest, such as through the AIChE Computational Molecular Science and Engineering Forum.

Forum Name: Neural Net & Related Topics

Moderator: John Guiver

Co-Moderator: Paul Turner

The aim of this discussion forum is to create an environment for engineers in the process industries to discuss the application of neural networks and other empirical modeling technologies. We would like to encourage both advocates of neural net technology, and, just as importantly, skeptics, to use this forum as an opportunity for conducting an informed, constructive and honest debate.

The discussion can include (but is not limited to):

General application areas - inferred measurements, multi-variable controllers, sensor validation, data reconciliation, data analysis and others
Specific process applications such as polymer inferentials, bio-process modeling, NIR analyzers, and others
Advances in architectures, objectives, and training algorithms that specifically relate to the process industries
Dynamic modeling - architecture, signal design, model identification, and model-based control
Online adaptation of models
Hybrid modeling and other interplays with first principles models

Forum Name: Numerical Methods and Optimization

Moderator: Larry Biegler

The discussion forum on numerical methods and optimization is devoted to the following topics:

Advances in methods for scientific computing for process applications
Advances in optimization methods for continuous and discrete variable problems
Difficulties of current methods on classes of process applications
Influence of problem formulation on performance of numerical algorithms

Forum Name: Open Standards for Technical Data Exchange and Software Interoperability

Moderator: Tom Teague

The Open Standards for Technical Data Exchange and Software Interoperability discussion forum will promote an open industry discussion about the need for the global process industry to rapidly develop and deploy practical electronic technical data exchange and software interoperability standards.

Most companies suffer significant cost and schedule inefficiencies in their work processes because the supporting software is not data-integrated or interoperable. Technical and business data must be manually transferred

across the many "islands of automation" that prevail within and across process industry companies today. Different software packages are used with costly manual intervention or custom software solutions to solve integrally related technical problems. Effective electronic technical data exchange and software interoperability standards would allow automated data transfers and calculation integration between the myriad of software, databases and companies in the process industry. Effective standards could enable the industry to achieve significant cost and schedule reductions in work processes, achieve a significant advance into concurrent engineering practices, and allow internet-based electronic commerce solutions between various participants in the process industry supply-chain. While this problem has been recognized for some years now, for a number of reasons, the development of process industry standards in this area over the last 8 years have been agonizingly slow.

Possible topics of discussion include:

Discuss progress and status of current ISO standards efforts
Discuss progress and status of CAPE-OPEN and OPC software interoperability standards
Discuss how can the technical people close to this problem get process industry senior management to actively engage and help solve this problem more rapidly
Discuss how can the standards development processes be improved and speeded up to get to a comprehensive, deployed set of standards quickly
Discuss the cooperative development of an XML process engineering vocabulary for internet/intranet solutions
Brainstorm ways of how the industry can work jointly to solve this problem to the benefit of all.

Forum Name: Plant Engineering & Design

Moderator: Jim Madden

The Forum will promote the identification and wider adoption of the best methods of plant design and help designers in all disciplines to make their contribution to improving the economic performance, safety and environmental acceptability of process plants.

The Forum will encourage the free exchange of experience, technique and ideas amongst the members of the plant design and operating community, by providing an open, multi-discipline and non-hierarchical environment where:

Ideas and experience can be contributed and validated in a professional and constructively critical but non-judgmental atmosphere free from hostility.
Individuals from all plant disciplines, whether in industry or academe, can join in to contribute or to learn.
A consensus can be created to recognize good practices considered worthy of wide dissemination.

Any topic can be raised and, by common consent, become an individual subject for focused discussion.
--

Recognized expert individuals can, by common consent, lead discussion of the focused topics.
--

Creative thinking on old and new problems can be stimulated.
--

The Forum will succeed if the design techniques and validated experience emerging from the discussions prove worthy of acceptance in the leading process industry companies.

Forum Name: Polymer Technology

Moderator: Kyu Yong Choi

The purpose of the Polymer Technology forum is to provide a way for researchers in the area of polymer process technology to communicate and share new ideas, data, opinions, research problems and other relevant information to the polymer technology. The topics to be posted for discussion should be of interest to other researchers outside the requestor's organization. Initially, this forum will be open to those who have the vast interest in polymerization process technology. In the future, the scope of the forum will be expanded to accommodate more diversified topics.

Possible initial questions, problems and discussion points (Examples):

What will be the new directions for the polymer process R&D in the next 5-10 years?

What will be the major R&D goals for polymerization process technology?

What will be the impact of internet/information technology on the polymerization process research and development?
--

What changes in undergraduate/graduate education should be made, if necessary, to have students prepared for the challenges in the polymer industry?
--

What will be the future of metallocene catalyst based polymerization technology?
--

What computational tools should be developed to advance polymerization process technology?
--

What new disciplines/technology will impact the polymer industry in the next several years? For example, what will be the impact of computational fluid dynamics (CFD) technology on the polymer industry? Examples of applications?
--

What will be the role of process modeling and simulation technology in advancing polymerization process technology?

Forum Name: Process Engineering & Design

Moderator: Art Westerberg

Co-Moderator: John Baldwin

Our mission is to improve how engineers design processes. Viewing design broadly, we invite discussions on such topics as modeling and simulation, insights for supporting innovation and creativity, formulation of proper design goals, organizing and sharing information and supporting social issues such as collaboration. As several of the other forums within Process City specialize on topics that are a part of or closely related to process engineering and design, we shall strive to cover issues that extend across or are at the interfaces among these more specialized topics.

Some initial issues:

How can we best educate chemical engineers to understand the impact of business decision making on design?
--

Designing the best technical product is only a small part of bringing a new process on stream. Other issues are how to introduce the product(s) to the market, how to price them in view of the competition, how to finance the design, where in the world to build the new process, etc.

How much new design and how much retrofit design is industry really undertaking at this time?

Assuming computing hardware and software will each be about 100 times faster over the next decade, what will be the future for simulation and optimization tools? Can we continue to add more and more detail to models and still solve them reliably?
--

What are all the goals that companies have for a process?

How does one "test" how well a proposed design meets each of these?

What are some of the experiences industry is having in setting up virtual teams (for example, around the world)?
--

Forum Name: Process Instrumentation & Control

Moderator: Harold Wade

The mission of the Process Instrumentation and Control discussion group is to provide a forum for discussion and exchange of information related to instrumentation and control equipment and practice in the process industries. The environment of process instrumentation and control systems is changing rapidly, as is the role of the instrumentation/control systems engineer, driven by rapid technological changes and by the rush to both horizontal and vertical integration with other systems. A sharing of mutual experiences will be beneficial to all.

Discussions based upon actual experience is welcome, although unwarranted negative comment directed toward any vendor, product, institution, technique or individual is not. Also, this is not a forum for overt commercialism. A suitable, but non-exclusive, list of topics include:

Design, evaluation, selection, application, installation, maintenance and performance of sensors and final actuators and control systems
--

Open communication standards for real time instrumentation and control system

Design, application, performance and maintenance of conventional and advanced regulatory control strategies, as typically implemented with standard tools of a DCS or PLC

Comparative experiences with other control technologies, including advanced process control, neural nets and fuzzy logic
--

Factors related to HMI for process control systems
--

Interface to higher level systems, such as advanced process control and ERP systems

The changing role of the instrumentation and control systems engineer in the light of current technology and the vertical integration of instrumentation and control into higher level systems
--

Forum Name: Process Modeling & Simulation

Moderator: Warren Seider

This forum focuses on two topics:

- (1) process simulation as implemented in the flowsheet simulators, and
- (2) process modeling, on a stand-alone basis, as well as for use with the process simulators.

Issues under process simulation involve the architectures of steady-state and dynamic simulators, and the incorporation of optimization algorithms. Included are sequential modular, simultaneous modular, and equation-oriented architectures.

The areas under process modeling include:

Equilibrium and conservation models involving linear algebraic and nonlinear equations
Transport and kinetic models involving ODEs and DAEs
Process optimization models

Issues associated with both topics include the role of spreadsheets (e.g., EXCEL), symbolic mathematics packages (e.g., MATHEMATICA), stiff ODE and DAE solvers (e.g., ODEPACK and DASSL) and the associated index problem, finite-element PDE solvers (e.g., PDECOL) and the associated adaptive-grid algorithms, homotopy-continuation algorithms (e.g., PITCON), bifurcation packages (e.g., AUTO 97), singularity theory, and packages for display in multidimensional coordinates.

Forum Name: Process Monitoring and Data Analysis

Moderator: John MacGregor

Co-Moderator: Dora Kourti

Historical data collected routinely on most processes provide a potentially valuable source of information for

improving process operability and product quality. The problems of interest in this forum include:

The exploration and analysis of historical data for process troubleshooting and improvement
Process monitoring and fault diagnosis
The development of soft sensors/inferential models
Extraction of information from multivariate sensors
Other novel ways of using process data

Both empirical and fundamental model based approaches are of interest. Empirical modeling approaches might include latent variable models based on partial least squares (PLS) and principal component analysis, neural networks and genetic algorithms. However, emphasis must clearly be on the problem and not the algorithm.

Forum Name: Process Safety & Reliability

Moderator: Ian Sutton

The mission of this forum is to discuss how risk management techniques can improve the safety, reliability, and profitability of process plants. The forum will include discussions on the latest developments in safety regulations from around the world.

Forum Name: Process Synthesis & Process Integration

Moderator: Antonis Kokossis

Co-Moderator: Robin Smith

The mission of this discussion group is to provide a forum to discuss conceptual design methods, modeling techniques, and optimization applications in the area of Process Synthesis and Process Integration. The development of a layout (“synthesis”) is a major task that requires the selection of the appropriate processes (i.e. distillation as against extraction), the appropriate units (i.e. bubble column as against a counter-current reactor), and the appropriate interconnections amongst the units (i.e. allocation of recycles, sequencing of units).

This forum is intended to address the needs of practicing engineers, academics, business and design managers, R&D modelers, and others interested in this area. Please feel free to make suggestions and/or recommendations for improvements as to how the forum is conducted.

Application areas include:

1. Reactor design
2. Reaction-separation systems
3. Energy efficiency
4. Separation
5. Reactive-separation
6. Utility networks
7. Environmental design
8. Synthesis of novel chemicals
9. Flowsheet integration and optimization

Modeling and optimization technologies include:

Conceptual approaches and conceptual optimization
Mathematical programming techniques
Stochastic optimization techniques
Commercial tools and applications

Forum Name: Product R&D

Moderator: Kevin Joback

The research and development of new chemical products is essential to the process industries. However, much of the emphasis to date has been on "how" we make products not on "what" products we should be making. This emphasis is particularly evident in the lack of software tools for "product" simulation and design as compared with the abundance of tools for "process" simulation and design.

Today's chemical products must be developed under increasingly stringent constraints. Solvents, lubricants, adhesives, plastics, and heat transfer fluids must all have higher performance while having low environmental impact, low toxicity, be inherently safe, and be in compliance with innumerable government regulations. In addition the market lifetimes of many chemical products, especially pharmaceuticals and agricultural chemicals, are being dramatically shortened. Fortunately, advances in combinatorial chemistry, molecular modeling, and property estimation now enable scientists and engineers to quickly screen large numbers of candidate products.

This forum provides a means for exchanging questions, answers, comments, and advice on the research and development of new products. The topics discussed may range from the particular impact of new regulations or scientific discoveries to the broad philosophies of new product development. Of particular interest is how computer technology is improving the product discovery process.

Forum Name: Production Management

Moderator: Pat Bell

The primary intent of this ProcessCity discussion forum is to facilitate an open collaborative environment for discussing key issues pertaining to production management business process functions in process manufacturing facilities. Specifically, the forum's goals are to help develop a common understanding of the role of the key production management business processes in optimizing process facilities, to provide examples of typical current practices, current best practices, and true potential for the production management business process functions. The key business process functions included in the production management knowledge domain are:

Process Order & Directives Management
Product Blending Order & Directives Management

Process Recipe Management
Plant Inventory Management
Process Recipe & Transition Execution
Material Movements Execution
Product Blending Execution & Optimization
Product Classification
Production Accounting
Offline Plant & Enterprise Data Resolution & Reconciliation
Feedstock & Product Quantity & Quality Tracking
Genealogy
Planned/Scheduled/Actual Variance Analysis
Key Performance Indicator & Value Added Analysis

Forum Name: Production Planning & Scheduling

Moderator: Ignacio Grossman

Co-Moderator: Conor McDonald

The mission of the Process City Production Planning and Scheduling discussion group is to provide a forum to discuss modeling, optimization techniques and strategies for the planning and scheduling of multiproduct batch and continuous processes.

This forum is intended to address the needs of practicing engineers, academics, students, business and logistics managers, R&D modelers, and others interested in this area. Please feel free to make suggestions and/or recommendations for improvements as to how the forum is conducted.

The topics in this forum will typically include:

Multiperiod production planning for continuous and batch plants
Planning for capacity expansion
Short term scheduling for batch plants
Cyclic scheduling for continuous plants
Reactive scheduling
Scheduling for new product development (agricultural chemicals, pharmaceuticals)
Planning and scheduling under uncertainty
Planning and scheduling for supply chain optimization
Mixed-integer optimization techniques (MILP, MINLP)
Constrained logic programming (CLP)
Stochastic optimization techniques (simulated annealing, genetic algorithms)
Computer software
Applications for refineries, chemical processes, polymer plants, specialty chemicals, pharmaceuticals and food manufacturing, steel plants, paper processing, utility plants, oilfields, and other plant-centric industries

Forum Name: Separations Technology**Moderator: George Keller**

The purpose of the separations forum is to provide a way for researchers and practitioners in this area to communicate and share new ideas, data, opinions, economic information and other relevant information. Discussion topics should be:

Broad enough to be interesting to a wide group of people
--

Focused on information that is truly new and likely to be of high impact and of commercializable quality
--

These are admittedly difficult criteria, but without some quality-control guide of this sort, we are likely to be swamped with relatively trivial, niche-filling and low-impact stuff

The field of separations should be taken as quite broad. It obviously includes separations involving organic chemicals; bio-materials; aqueous systems; hydrometallurgical materials; gases; multi-phases including gases, solids and/or liquids; etc. Ideas should always include informed speculations on where and how a particular idea could have impact. Economic insights are always greatly appreciated.

Forum Name: Thermodynamics & Physical Properties**Moderator: Stanley Sandler**

The goal of this discussion forum is to promote a dialogue between engineers, scientists and academic researchers in the broad area of thermodynamics and its application in traditional and nontraditional areas relevant to the chemical and pharmaceutical industries. While all areas of thermodynamics are open for discussion, this forum is not meant to be a substitute for the technical support provided by process simulation companies.

The discussion topics that are encouraged in this forum include, but are not limited to:

The development of new thermodynamic models and the shortcomings and failures of existing models;

The results of benchmark studies comparing thermodynamic models;
--

The availability of new experimental data, and identification of areas in which new data are needed;
--

The availability of new experimental facilities or new measurement methods;

The discussion of how to best measure certain properties or phase behavior;

The role of molecular-level simulation and quantum chemical calculations in process simulation;

The role of thermodynamic and phase equilibrium calculations in nontraditional areas such as solid state processing, environmental science, polymer processing, biotechnology, safety, industrial hygiene, environmental engineering and other areas.

Forum Name: General Career Discussion Forum**Moderator: Open Community**

This is an unmoderated open area for anyone to start discussions around career topics, as contrasted to business or technical/technology topics. These could include career development issues, training issues, pros and cons of an MBA or other advanced degree, questions or advice on what skills are needed for the future, discrimination issues in the workplace, problems in balancing career and family, or any other career-related topic. This forum is open to all questions or ideas related to careers, not just leading edge topics. Contributors should feel able to freely explore ideas with their colleagues and to seek solutions or assistance to particular problems that they have.

The four Business topics are:

Asset Management

General Business Discussion Forum

Impact of the Internet & E-Commerce

Supply Chain Optimization

Forum Name: Asset Management**Moderator: Joe Morray**

Increasingly, owner-operators in the process industries are recognizing the benefits that are available from integrating their plant information from early conceptualization to the ongoing requirements of maintenance and operations of a facility. The historical disconnects between plant asset design information and operations/maintenance information are proving to be unacceptable in the highly compressed global market place, where dramatic reductions in cycle time, massive re-use of plant information, and consistent product quality on a global basis are the standards by which most companies are measuring success. The discussion group will focus on documenting examples of where companies have successfully integrated information regarding different phases of a plant and what have been the economic benefits of such integration. The discussion group will attempt to define what asset management means in the context of new technologies and how can the new level of "informationalization" be beneficial to all of the mission critical work processes of a plant. In addition, a number of the findings and requirements from the Owner-Operator Forum will be documented and discussed in this discussion group.

Forum Name: General Business Discussion Forum**Moderator: Open Community**

This is an unmoderated open area for anyone to start discussions around business topics, as contrasted to career or technical/technology topics. These could include management practices, marketing problems, strategic planning, raising capital for new ventures, supply chain management, or any other business-related topic. This forum is open to all questions or ideas related to business, not just leading edge topics. Contributors should feel able to freely explore ideas with their colleagues and to seek solutions or assistance to particular problems that they have.

Forum Name: Impact of the Internet & E-Commerce**Moderator: Srikant Gokulnatha**

The Internet is changing the way that business is conducted. Although the process industries may have been initially slower to feel the impact of this change, things are rapidly changing as on-line exchanges, collaborative sites and the quicker transfer of information change the way that companies operate. This forum is meant to explore all issues related to the impact that the Internet and e-Commerce is having on the process industries and business in general."

Forum Name: Supply Chain Optimization**Moderator: Stephen Graves**

The goal of supply chain management is to coordinate the material flow over the entire global supply chain so as to match supply to demand in the most cost-effective manner. The purpose of this forum is to facilitate knowledge sharing on the challenges of global supply chain management and on the best practices for the optimization of supply chains. This forum is designed for the discussion of various tactics and strategies for coordinating the supply chain. The major focus will be on supply chain design, supply chain planning and supply chain partnering. Some examples of typical discussion topics are as follows:

Design: Size and location of production and distribution facilities. Cost of product variety. Value of delayed product differentiation or postponement. Location of strategic safety stocks.
--

Planning: Implementation challenges of advanced planning systems. Tactics for capacity allocation, order commitment and scheduling. Forecasting methods.
--

Partnering: Value of information/forecast sharing. Pricing mechanisms and contracts. Partnering arrangements like VMI. Make/buy decisions.
--

What is the Internet Paradigm

By Einar (Stef) Stefferud



Einar Stefferud founded Network Management Associates in 1969 to provide strategic technical and policy management advice for network environments. He co-founded First Virtual Holdings in 1994, which operated an Internet Payment

System. His practice includes documented planning for governance of Internet infrastructures. Also, Mr. Stefferud is heavily involved with the Open Root Server Confederation (www.open-rsc.org).

SUMMARY

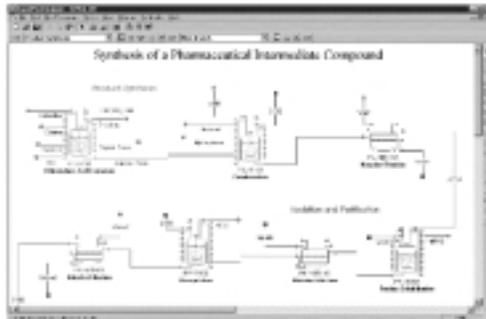
The Internet provides raw power. Thus, the net works as an amplifier that can reward results and self-discipline, or problems and inefficiency. The presentation discusses the growth of the Internet and its working paradigms, as well as its evolution, for example, the concept of interworkability (beyond interoperation), in order to achieve the massive collaboration made possible by the Internet. This massive collaboration motivates several governance principles, including a move away from centralized control and a stressing self-discipline. Sublayer independence and a simple core with complex edges are also discussed as part of the Internet Paradigm.

See www.castdiv.org for a downloadable copy of the presentation Dr. Stefferud gave in September 1999.

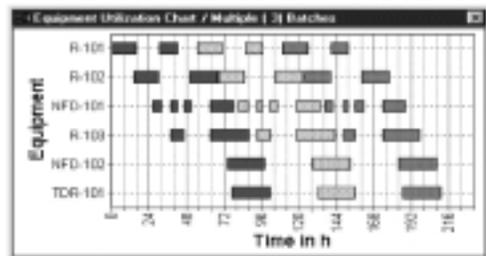
--- **Fun fact for the day.** The number of U.S. employees working in computer services nearly doubled from 1992 to 1998 to 1.6 million people! [www.zdnet.com/pcmag; Jun 13, 2000]

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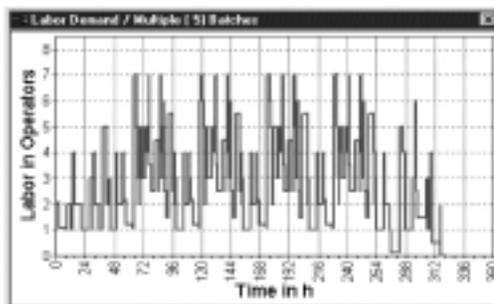
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- Several thermo methods. Linkage to DIPPR.
- Advanced throughput analysis and debottlenecking capabilities.
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COMMUNICATIONS

Larry Biegler is selected as the CAST Division 2000 Computing in Chemical Engineering Award Recipient

By Peter Rony



"For outstanding contributions to the development and application of nonlinear programming techniques to process design and control," Larry Biegler is this year's winner of the CAST Computing in Chemical Engineering Award. As

accomplishments of this year's award winner, the nomination package states the following:

"Through optimization methods, process design has acquired a strong scientific basis by allowing rigorous quantitative modeling and decision making in process flowsheets. Larry Biegler has been a pioneer and world leader in this field. Given the importance of process systems engineering and its place as one of the frontier areas to be emphasized in future years, Biegler's research contributions rank among the best of young engineers in both quality and relevance to our profession."

"One of Biegler's major contributions has been the conception and development of "infeasible path" strategies for computing optimal designs. In the past, design optimization was regarded as an interesting academic exercise but with little practical relevance due to the large computational expense that was required with earlier methods. In Biegler's research, he developed the notion that simulation and optimization through sequential quadratic programming (SQP) can be performed simultaneously with substantial savings in computation time. The term "infeasible path" is used because during optimization the equations describing the process states are not satisfied: the intermediate states are "infeasible." The process equations are converged simultaneously with the search for the optimal solution, thereby greatly reducing the computational time and effort."

"The importance of these ideas has been recognized by industry. Biegler's algorithms have been incorporated in commercial process simulators (like ASPEN PLUS) so as to make flowsheet optimization a practical reality. Furthermore, Biegler himself incorporated his method into the FLOWTRAN simulator, which has been distributed by

CACHE and used extensively at many universities in the U.S. and abroad."

"[Biegler] has also become a leader in the development of techniques for the optimization of processes described by systems of differential/algebraic equations. He has accomplished this by combining sequential quadratic programming and orthogonal collocation techniques in a novel and efficient manner. This has led to the capability of optimizing flowsheets with differential equations, which constitutes a major advance because it allows the designer to model chemical reactors and other spatially varying units, instead of simply using the common approximate "input-output" relations."

"In addition to his work in process optimization, Biegler has made very significant contributions in two other areas of design research. The first of these involves synthesis of chemical reactor networks. In this work, based on elegant concepts of attainable regions, Biegler has demonstrated that rigorous kinetic models can be brought in at the early stages of design to increase the scope for process optimization. ... The second area in which Biegler has become a leader is in optimization approaches for process control. Major contributions have been the development of techniques for the explicit treatment of constraints and nonlinear process models."

"In addition to making outstanding technical contributions, Larry Biegler has been extremely active serving our profession. He was chair of Area 10a of AIChE, Past President of the CAST Division and CACHE, and co-chair of FOCAPD'94 and the IMA Workshop on Large-Scale Optimization. He is currently Associate Editor of Industrial and Engineering Chemistry Research and chair of the ADCHEM 2000 Meeting in Italy. He has taught many industrial short courses at AIChE, Carnegie Mellon, and MIT, and is co-author with Ignacio Grossmann and Arthur Westerberg of the recent textbook, "Systematic Methods for Chemical Process Design". He is also the current director of the Center for Advanced Process Decision-making at Carnegie Mellon."

"Larry Biegler was given in 1991 the Air Products Extraordinary Quality Award for the economic impact of his successive quadratic programming methodology. The respect with which he is viewed by the chemical engineering community -- both industrial and academic -- is evidenced by the long list of invited and keynote papers he has delivered, by the two "Best Paper" awards he received from Computers and Chemical Engineering and by his selection as a Presidential Young Investigator at the age of only 28."

"Larry Biegler represents the new breed of researchers who effectively and creatively combine the fundamentals of process engineering, numerical analysis, and mathematical programming. The impressive productivity of his research is matched by a high standard of quality. He is without doubt one of the leading researchers in Process Systems Engineering, and hence he is an outstanding candidate for the Computing and Chemical Engineering Award."

Letters in support of the nomination stated the following:

"My overall assessment of Larry Biegler is that he ranks among the most outstanding and successful chemical engineers when judged broadly across all areas, and he is certainly in the very top rank of chemical engineers in the systems area."

"Dr. Biegler has done for large-scale optimization in chemical engineering what Dr. John Prausnitz at Berkeley has done for phase equilibrium. [He] has been on the cutting edge of research in and development of the field, but has also taken the time to show others how his work can be applied and made useful."

"Dr. Biegler's work is based on sound fundamental mathematical concepts. His thorough understanding of simulation, optimization, control, and advanced mathematics has made him a highly sought-after expert for writing review articles and presenting seminars."

"His PhD research showed how to implement, efficiently and simply, the successive quadratic programming algorithm. The result was a merger of flowsheet simulators with this advanced optimization algorithm in a framework that has subsequently been implemented by all of the major simulation companies. Thanks to this advance, process designs are now routinely optimized in the time it takes to complete a single simulation of the flowsheet."

"Clearly, in just 20 years, the research results of Lorenz T. Biegler are having a major impact. In computer-aided process design and control, his work is broad. He is a prolific author, whose papers are widely read, and a popular speaker at nearly all of the research conferences."

"Larry is unique among younger professors in terms of the impact his research results have already had in the industrial practice of chemical engineering as well as on chemical engineering education."

"He has been one of the strongest investigators I have known in the field of optimization and chemical processes and process systems engineering. ... He has been particularly effective in teaching about computing to students and professionals."

John Ayala is selected as the CAST 2000 Computing Practice Award Recipient

By John T. Baldwin



John Ayala has been awarded the Computing Practice Award for his pioneering developments, reduction to practice in terms of software products and implementation practices, and industrial application of advanced process control and real time optimization technologies.

Following his graduation from MIT with a Master in Chemical Engineering Practice degree in 1977, John started his professional career at Shell Oil Company's Norco Refinery, where he remained until joining the Advanced Process Control Group at M. W. Kellogg in 1986. In 1987 he then joined founder Charles Cutler at DMC Corporation (DMCC) as General Manager of Projects where he remained until DMCC was acquired by Aspen Technology in 1996, where he continues to work today.

John has always been recognized as an outstanding process engineer, with exceptional abilities to analyze and understand the complexities in the behavior of a refinery or petrochemical process. Charles Cutler, a well-known member of the advanced control area who has worked closely with John since his first assignment at Shell in 1977 stated, "Without any reservation, John is the best engineer I have worked with in my 40 years." Charles further states, "I believe John is the most knowledgeable person in the world on open equation modeling and real time optimization."

Some achievements during John's early years resulted from his exceptional technical leadership in the early development and pioneering applications of Dynamic Matrix Control (DMC) technology and real-time optimization (RTO) based on a comprehensive model of the plant in open equation format. Today these approaches are almost universally accepted as effective ways to control and optimize the operations of a plant. In his early years at Shell, John was the first to provide the technical leadership required to deploy them in a wide variety of refinery and petrochemical plants.

John's outstanding ability to play several roles led to his contributions during his early years for the following reasons:

1. At the core was the fact that he was an outstanding process engineer.
2. He had an ability to transfer the basic technology to computer code that was sufficiently practical and reliable to be used in an operating plant environment.

3. He demonstrated exceptional innovation and creativity in overcoming technical problems so that the technology would work as intended in specific applications.
4. He was able to gain the respect of the parties with vested interests in the outcome, including managers and engineers as well as operators and technicians.

John consistently provided technical leadership for a large number of real applications of advanced control technologies, always "closing the loop" by leveraging experiences to improve and refine the technologies, significantly advancing the state of the art in the process.

Clearly, John is an outstanding engineer, advanced control technologist, and leader who is worthy of the 2000 Computing Practice Award of the Computing and Systems Technology Division of the AIChE.

Mayuresh V. Kothare wins the Ted Petersen Student Paper Award for 2000

By Peter Rony



Mayuresh V. Kothare, who did his M.S. and Ph.D. work at Caltech under Professor Manfred Morari, has won the CAST-Division Ted Petersen Student Paper Award. His paper is entitled "Robust Constrained Model Predictive Control Using Linear Matrix Inequalities", by M. V. Kothare, V. Balakrishnan, and M. Morari

[*Automatica*, 32, 1361-79, October 1996].

Supporting letters for the award stated:

"The paper represents a landmark in both the predictive control and the robust control literature. Its impact reaches far beyond the typical applications in process control. In the last 3 1/2 years, other researchers from different areas cited the paper almost fifty times, which compares favorably with previous Peterson Award recipients."

"The novel features and important developments reported in this publication can be summarized as follows:

- The method provides robust stability and performance guarantees for constrained multi-variable systems for a specified range of model uncertainty. It takes into account the effects of feedback which makes the method significantly less conservative than most other attempts to solve this problem.
- The technique can handle more general uncertainty descriptions than any other robust predictive control algorithm published prior or afterwards: finite impulse response uncertainty (with correlations among the coefficients if appropriate) as well as uncertainty in the linear fractional transformation structure.
- The method employs a linear matrix inequalities (LMI) formulation, which was novel in 1994 when the work was first presented but has since taken the control community by storm. By employing this methodology, the [authors] also bridge the gap between the process control-oriented dynamic matrix control literature and the theory-oriented mathematical control papers.
- Though this technique was formulated by Kothare and co-workers in the context of state feedback, extensions are indicated to cover "scheduled" systems where one or more of the changing parameters is measurable, and to the output feedback case. These extensions greatly

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increase the applicability and reduce the conservatism of the proposed techniques.

- In his review paper for the 1998 Model Predictive Control Workshop, Prof. David Mayne, Imperial College London, praised this work to be the only one properly accounting for feedback effects in robust Model Predictive Control. Prof. Mayne is one of the senior leaders in the control field."

"This paper, published in one of the premiere control journals, marks a turning point in the predictive control literature."

"The nominated paper is an exceptional contribution and strongly merits recognition for its excellence and originality."

"Because the paper lists two co-authors, it is important to describe their contributions. Balakrishnan, now on the faculty at Purdue University, was a postdoctoral student at Caltech and presented a course on the use of linear matrix inequalities in control. Kothare was intrigued by the presented ideas, took the initiative, saw the applicability to the robust MPC problem and started the research. Kothare deserves not only credit for the initial idea but for its complete execution."

"[From the industrial perspective] of someone concerned with the development and deployment of computing and systems technology in solving industrial process problems, the primary contributions of Mayuresh's paper are:

- The paper provides results that, for the first time, proceed from fundamental developments in the mathematical literature of Linear Matrix Inequalities (LMI) and systematically end with a practical, useful formulation for robust MPC.
- The class of model uncertainties considered in the paper is fairly general and not restricted to the simpler Finite Impulse Response (FIR) models, thereby providing, again for the first time, a completely rigorous and general framework for robust MPC.
- Starting from the assumption of state-feedback and an unconstrained regulation objective, the development systematically extends the formulation to incorporate input and output constraints and other standard problems such as time delays, trajectory tracking, constant set-point tracking, and disturbance rejection."

"In summary then, Mayuresh's paper illustrates a unique combination of strong theoretical capabilities in systems theory and applied mathematics, on the one hand, with a keen sense of practical implementation issues on the other."

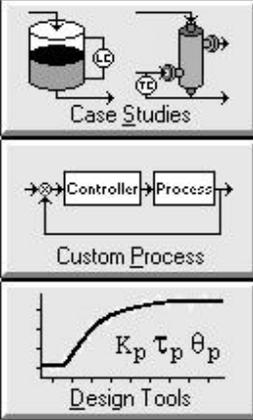
"... To their strong credit, Khare and his co-authors tackled the important problem [of robustness in model predictive control] head on in their paper and provided an imaginative solution. Indeed, there is only one other paper that I am aware of that recognizes and addresses this problem. The mere fact that Kothare recognized the problem and provided a solution is a tribute to his originality. "

"One of the [issues] impeding the use of MPC in new sectors is the effects of modeling errors and understanding how MPC behaves when both constraints and model errors are present. The paper makes three contributions to this area:

1. It uses the same framework for describing modeling uncertainty as is used in mainstream robust control theory. This makes it applicable to realistic situations, gives it credibility, and allows it to harness the considerable work that has gone into translating real-world uncertainty into the mathematical framework.
2. It makes a significant modification to standard MPC algorithms, optimization being performed over linear feedback policies rather than over open-loop trajectories. In various subsequent works this has proved to be a key idea.
3. It taps into the relatively recent development of interior-point methods for convex optimization. Specifically, it uses the machinery of linear matrix inequalities, which has been shown to be extremely effective in the systems and control area during the last few years.

"[This paper was the first to manage] to break away from unrealistically simple assumptions about the models considered, and about the nature of the uncertainty about those models. It has had a very great influence on subsequent research into robust MPC."

--- **Get in the habit of analysis - analysis will in time enable synthesis to become your habit of mind.** --- Frank Lloyd Wright



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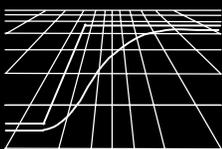
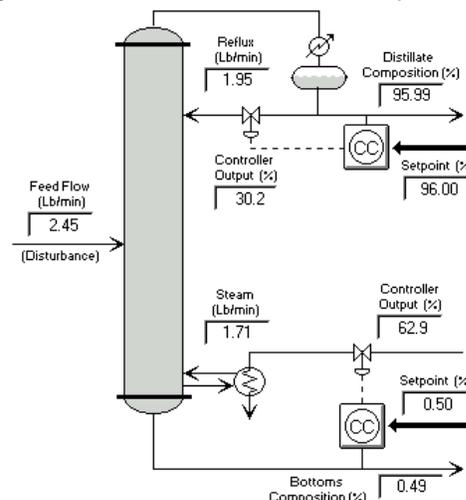
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CAST10 E-Mail List

Ray Adomaitis, University of Maryland, has taken over the duties as moderator for the CAST10 mailing list.

The list operation will continue to function in essentially the same manner as before, but with the following exceptions:

- 1) To post messages to the list, please send mail to: cast10@ench.umd.edu
- 2) Subscribe/unsubscribe messages should be mailed to: emailman@ench.umd.edu
- 3) Archived messages as of 1 Sep. 2000 can be found at: www.ench.umd.edu/cast10
- 4) Specific instructions on (un)subscribing and posting messages are located at: www.ench.umd.edu/cast10/subscribe.html

Please note that you can use a short list of keywords to specify where you would like to have your message archived. To use this function, include as the first line of your message:

Keywords: software, jobs, education, meetings
using any or all of the keywords.

Ray would like to invite comments on the operation of the email list and archive website, especially suggestions of useful services that can be provided through this list. Send them to adomaiti@Glue.umd.edu.

MEETINGS, CONFERENCES, CONGRESSES, AND WORKSHOPS

New Location of Meeting Section

This section has been moved on-line to www.castdiv.org. See the screen capture below. As announcements are posted on the CAST10 e-mail list at cast10@ench.umd.edu, summaries will be added to the website. Other sources of meeting information will be used as well; a direct e-mail to the Editors will ensure that your favorite CAST-related meeting is listed.

The move was accomplished because the Editors saw several advantages: lower postage costs, more up-to-date information, and live hyperlinks to all the meetings. However, if you do not have access to a web browser and thus can no longer read the Meetings and Conferences section, contact the Associate Editor, Karl Schnelle, for a current copy.

Please give AIChE your e-mail address, if you have not already done so. See page 2.

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CAST Communications

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A. Background Data

1. Name of the Award _____ Today's Date _____
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3. Present Position (exact title)

4. Education

Institution	Degree Received	Year Received	Field
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

5. Positions Held

Company or Institution	Position or Title	Dates
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

6. Academic and Professional Honors (include awards, memberships in honorary societies and fraternities, prizes) and date the honor was received. Use separate page.
7. Technical and Professional Society Memberships and Offices. Use separate page.
8. Sponsor's Name and Address

Sponsor's Signature

*A person may be nominated for only one award in a given year.

THE DEADLINE FOR AWARD NOMINATIONS IS April 15, 2001.

B. Citation

1. A brief statement, not to exceed 250 words, of why the candidate should receive this award. (Use separate sheet of paper, please.)
2. Proposed citation (not more than 25 carefully edited words that reflect specific accomplishments).

C. Qualifications

Each award has a different set of qualifications. These are described in the awards brochure. After reading them, please fill in the following information about the nominee where appropriate. Use a separate sheet for each item if necessary.

1. Selected Bibliography (include books, patents, and major papers published).
2. Specific identification and evaluation of the accomplishments on which the nomination is based.
3. If the nominee has previously received any award from AIChE or one of its Division, an explicit statement of new accomplishments or work over and above those cited for the earlier award(s).
4. Other pertinent information.

D. Supporting Letters and Documents

List of no more than five individuals whose letters are attached.

	Name	Affiliation
1.		
2.		
3.		
4.		
5.		

Please send the completed form and supplement sheets to the CAST Division 2nd Vice Chair. Please check www.castdiv.org for the name and address for the 2001 2nd Vice Chair. Or the 2000 2nd Vice Chair will forward the nomination to the new chair for you: John T. Baldwin, Department of Chemical Engineering, Texas A&M University, College Station, TX 77843, Phone: 409-260-5020, Fax: 409-260-4912, Baldwin@ProInfo.com

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