



The Programme will include the presentation of the IChemE's MM Sharma Medal for Lifetime Achievement for Professor Roger W.H. Sargent

Professor Jay H. Lee

**Korea Advanced Institute of Science
and Technology (KAIST)**

**Mathematical Programming and Dynamic
Programming: How they have been used in control and can be
combined for further use in planning, scheduling and control of
multi-scale stochastic systems**

In the Chair: Professor Claire S. Adjiman, Centre for Process
Systems Engineering, Imperial College London

Vote of Thanks: Professor Eva Sørensen, Centre for Process
Systems Engineering, University College London

Abstract: Mathematical programming has been an important pillar of the process systems engineering discipline and has provided useful tools for making optimal decisions in many process design, operation planning/scheduling, and control problems. Dynamic programming has been the foundation of many classical optimal control methods, especially those addressing stochastic systems like the linear quadratic Gaussian method. In this talk, we will review how they have supported each other in the development of theories and tools for optimal control. This will be followed by a discussion on their shortcomings as individual methods for addressing multi-scale, stochastic decision problems and how they may be combined in a complementary manner to provide more general and powerful methods for solving such problems. Examples of multiple timescale planning scheduling problems in electric power grid operation and procurement in process industries will be presented to highlight the issues and illustrate the roles of the two respective approaches.

Biography: Jay H. Lee obtained his B.S. degree in Chemical Engineering from the University of Washington, Seattle, in 1986, and his Ph.D. degree in Chemical Engineering from California Institute of Technology, Pasadena, in 1991. From 1991 to 1998, he was with the Department of Chemical Engineering at Auburn University, AL, as an Assistant Professor and an Associate Professor. From 1998-2000, he was with School of Chemical Engineering at Purdue University, West Lafayette and then with the School of Chemical Engineering at Georgia Institute of Technology, Atlanta. Starting 2010, he is with the Chemical and Biomolecular Engineering Department at KAIST, Korea. He served as the department head from 2010-2015 and is also the founding director of Saudi Aramco-KAIST CO₂ Management Center there. He has held visiting appointments at E. I. Du Pont de Numours, Wilmington, in 1994 and at Seoul National University, Seoul, Korea, in 1997. He was a recipient of the National Science Foundation's Young Investigator Award in 1993 and also the AIChE CAST Computing in Chemical Engineering Award in 2013. He was elected as an IEEE Fellow in 2011, an IFAC Fellow in 2011, and an AIChE Fellow in 2013. He published over 150 manuscripts in SCI journals with more than Google Scholar citations. His research interests are in the areas of state estimation, robust control, model predictive control, planning/scheduling, and approximate dynamic programming.

Thursday 1 December 2016 • 17:30

Lecture Theatre 3 (Room 333), Department of Chemical Engineering, Roderic Hill Building,
South Kensington Campus, Imperial College London SW7 2AZ
Tea and coffee will be served before the lecture from 16:30 in the Common Room (Room 228)
Department of Chemical Engineering, Level 2, ACE Extension Building

The Twenty Third Professor Roger W.H. Sargent Lecture



The Professor Roger Sargent Lecture is an annual event the Centre for Process Systems Engineering inaugurated as a tribute to Professor Sargent's vision, leadership, significant technical contributions and to his legacy in the field of Process Systems Engineering.



Professor Jay H. Lee