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## **Model Predictive Control, State Estimation and Coordinated Vehicles**

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**The IEEE – Control Systems Society Distinguished Lecturer**  
University of California San Diego, USA

**Date :** 27 October 2003 (Monday)  
**Time :** 5:30pm for 6:00pm (Light refreshments will be provided from 5:30pm)  
**Venue :** Hawken Auditorium Engineering House, Institution of Engineers Australia  
447 Upper Edward Street, Brisbane

### **Abstract:**

Model Predictive Control is a popular, full-state-feedback control strategy because of its use of models and its capacity to handle constraints. When state estimates are included into the picture, the effect of state uncertainty on the constraints needs to be accommodated. This is done by backing off the constraints in a sensible (but not entirely obvious) way using the state covariance. This can affect solution feasibility.

These ideas are transposed into the problem of multiple vehicle coordination. The vehicles operate under distributed Model Predictive Control but interact via their constraints. The formulation of state inclusion gives guidance to the assignment of channel bandwidth in the communications network between the vehicles. The result is a unification of control objective and information architecture, which is achievable in the Model Predictive Control framework.

### **Speaker:**

Bob Bitmead holds the Cymer Corporation Chair in the Mechanical & Aerospace Engineering Department at the University of California, San Diego. He hails from Sydney, Newcastle, Townsville, Canberra and California, and has a long history of interaction with industry in Australia and USA on problems of control and estimation. Currently, his activities concentrate on problems of interest to the aerospace and telecommunications sectors. He is a Fellow of the IEEE and a Fellow of the Australian Academy of Technological Sciences & Engineering.