

with unknown state delay and measurement delay as well as with norm-bounded parameter uncertainties. For known time-delay systems, the state estimator derived is independent of parameter uncertainties; and for unknown time-delay systems, the state estimator is independent of parameter uncertainties as well as the time delays.

#### **SML04-5**

#### **Robust H-infinity Filtering for Systems with Deterministic and Stochastic Parametric Uncertainties**

*Fuwen Yang*

*Fuzhou University*

*Y.S. Hung*

*The University of Hong Kong*

In this paper, a robust H-infinity filter is designed for linear discrete-time systems with both deterministic norm-bounded parametric uncertainty and stochastic multiplicative noise parametric uncertainty. Necessary and sufficient conditions for the existence of the filter which achieves a prescribed estimation error level of disturbance attenuation for all admissible deterministic and stochastic parametric uncertainties are derived in terms of one Linear Matrix Inequality (LMI). Moreover, an optimal filter is obtained by minimizing the prescribed estimation error level subject to the condition of the LMI.

#### **SML04-6**

#### **On the Robust State Estimation of Nonlinear Stochastic Systems with State-Dependent Noise**

*Bor-Sen Chen*

*National Tsing Hua University*

*Wei-Hai Zhang*

*Shandong Institute of Light Industry*

*Yung-Yue Chen*

This paper mainly treats with the state estimator design of non-linear stochastic systems with state dependent noise. The state and measurement are corrupted by internal noise and exogenous disturbance, the exogenous disturbance in system equation is allowed to be stochastic uncertain. Some sufficient conditions on stochastic H-infinity and mixed H-2/H-infinity filter design are given in linear matrix inequalities(LMIs).

#### **SML05-1**

#### **System Theory for Information Technology**

*Xiren Cao, Li Qiu*

*Hong Kong University of Science & Technology*

In this talk, we will survey the applications of system theory in communications, signal processing and networking. We will also give the outlook on other potential applications.

#### **SML05-2**

#### **Introduction to the Center for Chaos Control and Synchronization**

*Guangrong Chen*

*City University Hong Kong*

In this talk, we will introduce to the audience the small but focused Research Center for Chaos Control and Synchronization at the City University of Hong Kong, about its mission, personnel, research projects, academic activities, and international cooperations. The Center was established in September 2000, and has now evolved to having 9 regular members, 2 eminent advisory members, and 60 some active associate members from more than 20 countries over the world. The Center has allied with 7 Research Centers or Institutes, and signed official agreements of cooperations with