

# **REAL TIME DIAGNOSTICS, PROGNOSTICS, & PROCESS MODELING**

Dimitar Filev  
*The Ford Motor Company*  
U.S.A.

**Abstract:** Practical and theoretical problems related to the design of real time diagnostics, prognostics, & process modeling systems are discussed. Major algorithms for autonomous monitoring of machine health in industrial networks are proposed and relevant architectures for incorporation of intelligent prognostics within plant floor information systems are reviewed. Special attention is given to the practical realization of real time structure and parameter learning algorithms. Links between statistical process control and real time modeling based on the evolving system paradigm are analyzed relative to the design of soft sensing algorithms. Examples and case studies of industrial implementation of aforementioned concepts are presented.

## **BRIEF BIOGRAPHY**

Dr. Dimitar P. Filev is a Senior Technical Leader, Intelligent Control & Information Systems with Ford Motor Company specializing in industrial intelligent systems and technologies for control, diagnostics and decision making. He is conducting research in systems theory and applications, modeling of complex systems, intelligent modeling and control and he has published 3 books, and over 160 articles in refereed journals and conference proceedings. He holds 15 granted U.S. patents and numerous foreign patents in the area of industrial intelligent systems. Dr. Filev is a recipient of the '95 Award for Excellence of MCB University Press and was awarded 4 times with the Henry Ford Technology Award for development and implementation of advanced intelligent control technologies. He is Associate Editor of Int. J. of General Systems and Int. J. of Approximate Reasoning. He is a member of the Board of Governors of the IEEE Systems, Man & Cybernetics Society and President of the North American Fuzzy Information Processing Society (NAFIPS). Dr. Filev received his PhD. degree in Electrical Engineering from the Czech Technical University in Prague in 1979.