

# Introduction to the Recipient of the 4<sup>th</sup> Chen Han-Fu Award

## Dr. Xiren CAO



- PhD in Applied Mathematics  
Harvard University, 1984
- Chair Professor,  
Dept. of Automation  
Shanghai Jiao Tong Univ.
- Professor Emeritus  
Hong Kong Univ. of Sci. & Tech.

# Main Achievements

- Perturbation analysis and Discrete Event Dynamic Systems
- Relative Optimization – a new paradigm for performance optimization, with no dynamic programming
  - Event-based optimization
  - Stochastic control with non-smooth value functions
  - Optimization with non-linear performance

# Awards and Honors

- IEEE Fellow, IFAC Fellow
- Second Class National Natural Science Award, 2009
- Outstanding Simulation Publication Award, The College of Simulation, The Institute of Management Sciences (TIMS), 1990
- Outstanding Transactions Paper Award, IEEE Control System Society, 1987
- Best Student Paper Award, IEEE Control System Society, 1982

# Books

- Y. C. Ho and Xi-Ren Cao, *Perturbation Analysis of Discrete Event Dynamic Systems*, Kluwer, 1991.
- Xi-Ren Cao, *Realization Probabilities - The Dynamics of Queueing Systems*, Springer, 1994.
- Xi-Ren Cao, *Stochastic Learning and Optimization, A Sensitivity-Based Approach*, Springer, 2007.
- Xi-Ren Cao, *Stochastic Control – with Relative Optimization*, in preparation