

Institute of Electrical and Electronics Engineers(IEEE) Hyderabad Section  
Joint Chapter of IEEE CIS/GRSS Societies, Hyderabad Section  
Presents

**CIS Distinguished Lecturer's talk on**  
**Nature-inspired Analytical Approaches for Engineering Systems**  
By  
***Prof. Alice E. Smith, Auburn University, Alabama, USA***

**Abstract:**

This talk will put forth several straightforward but successful implementations of analytical approaches inspired by natural systems to difficult engineering system design problems. These nature-based paradigms range in fidelity with their natural systems origins but all seek to leverage the structures and operations of nature doing what it does best – novelty detection, system optimization, adaptability to dynamic environments, robustness, and flexibility. More specifically, the well-known, but often misunderstood and misused, artificial intelligent paradigms of artificial neural networks, fuzzy logic, and evolutionary algorithms will be considered for use in engineering system design. Used judiciously and knowledgeably these approaches can offer significant advantages in diverse production and operational environments. A curated selection of applications from the speaker's 30 years of experience in this field will be explained and objectively analyzed. The applications are (1) quality and process improvement of large-scale ceramic casting, (2) real-time placement of drones for ad hoc communications network connectivity, (3) continuous monitoring of airport vehicles for predictive maintenance, and (4) the design of large order picking warehouses considering travel distance.

**Date: 15 May 2021,**  
**Saturday**

**Link to join:**

**Time: 6:30pm – 7:30pm**  
**(Indian Standard Time)**

**8am -9am (EST)**

**REGISTRATION FEE :**  
**NIL**

**Chapter/AG Leadership:**

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**Prof. Alice E. Smith, Fellow IEEE, Auburn University, Alabama, USA**

**Brief Bio:**



**ALICE E. SMITH** is the Joe W. Forehand/Accenture Distinguished Professor of the Industrial and Systems Engineering Department at Auburn University, where she served as Department Chair from 1999-2011. She also has a joint appointment with the Department of Computer Science and Software Engineering.

Her research focus is analysis, modeling, and optimization of complex systems with emphasis on computation inspired by natural systems. She holds one U.S. patent and several international patents and has authored more than 200 publications which have garnered over nearly 13,000 citations and an H Index of 47 (Google Scholar). She is the editor of the recent book *Women in Industrial and Systems Engineering: Key Advances and Perspectives on Emerging Topics* and a principal investigator on over \$10 million of sponsored research with funding by NASA, U.S. Department of Defense, Missile Defense Agency, National Security Agency, U.S. National Science Foundation and many more, from which she has been awarded 18 distinct grants including a CAREER grant in 1995 and an ADVANCE Leadership grant in 2001. She is a fellow of the Institute of Industrial and Systems Engineers (IISE), a fellow of the Institute of Electrical and Electronics Engineers (IEEE), a senior member of the Society of Women Engineers, a member of Tau Beta Pi and the Institute for Operations Research and Management Science (INFORMS), and a Registered Professional Engineer in Alabama and Pennsylvania. She was elected to serve on the Administrative Committee of the IEEE Computational Intelligence Society from 2013-18 and 2020-22

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