I-TP01

Invited Session

13:00-15:00 **Chair : Ju-Jang Lee(KAIST, Korea)**
Room :C105 **Co-Chair :**

13:00– 14:00 **I-TP01-1**

Neuro-Fuzzy Systems: Thoery and Applications

C.S. George Lee
(Purdue University, U.S.A.)

-Neuro-fuzzy systems are multi-layered connectionist networks that realize the elements and functions of traditional fuzzy logic control/decision systems. A trained neuro-fuzzy system is isomorphic to a fuzzy logic system, and fuzzy IF-THEN rule knowledge can be explicitly extracted from the network. This talk presents a brief introduction to self-adaptive neuro-fuzzy systems and addresses some recent research results and applications. Most of the existing neuro-fuzzy systems exhibit several major drawbacks that lead to performance degradation. These drawbacks are the curse of dimensionality (*i.e., fuzzy* rule explosion), inability to re-structure their internal nodes in a changing environment, and their lack of ability to extract *knowledge* from a given set of training data. This talk focuses on our investigation of network architectures, self-adaptation algorithms, and efficient learning algorithms that will enable existing neuro-fuzzy systems to self-adapt themselves in an unstructured and uncertain environment.

14:00 – 15:00 **I-TP01-2**

Biosign Recognition based on the Soft Computing Techniques with application to a Rehab-type Robot

Bien, Zeung-Nam(KAIST)

For the design of human-centered systems in which a human and machine such as a robot form a human-in system, human-friendly interaction/interface is essential. Human-friendly interaction is possible when the system is capable of recognizing human biosigns such as EMG signal, hand gesture and facial expressions so the some humanintention and/or emotion can be inferred and is used as a proper feedback signal. In the talk, we report our experiences of applaying the soft computing techniques including Fuzzy,ANN,GA and rhe rough set theory for efficiently recognizing various biosigns and for effective inference. More specifically, we first observe characteristics of various forms of biosigns and propose a new way of extracting feature set for such signals. Then we show a standardized procedure of getting an inferred intention or emotion from the signals. Finally, we present examples of application for our model of rehabilitatrion robot named.