

## Kolloquium Angewandte Informatik

### **PWM-ANFIS. A Computational Efficient Neuro-Fuzzy System.**

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Fuzzy Systems (FS) and Neural Networks (NN) are widely used techniques in Intelligent Systems. These systems cover many different application areas such as automatic control, pattern recognition, human-machine interaction, expert systems, modelling, medical diagnosis, economics, etc. Both techniques have their own advantages and drawbacks. FS have the ability to represent comprehensive linguistic knowledge and perform reasoning by means of rules. However, FS do not provide a mechanism to automatically acquire and/or tune those rules. On the other hand NN are adaptive systems that can be trained and tuned from a set of samples. Nevertheless, it is very difficult to extract and understand the acquired knowledge. In other words, FS and NN are complementary paradigms.

Neuro-Fuzzy (NF) systems have been proposed to combine the advantages of both techniques, as well as overcome the drawbacks of each one individually. These systems can combine both fuzzy and neuro paradigms in two different ways: (a) by introducing the fuzzification into the neural-network structure and (b) by providing the FS with learning ability by means of NN algorithms.

However, NF systems are rather complex because they integrate many different tasks working in a cooperative way. To overcome this drawback we propose a NF system in which the complexity is highly reduced without sacrificing appreciably its features or capabilities. The system is of the same type as the well-known "adaptive-network-based fuzzy inference system" (ANFIS) method about which many related works have been written. However, some different restrictions are applied to the system in order to reduce considerably the complexity of its inference mechanism. We call this system PWM-ANFIS as it provides a Piecewise Multilinear output.

Termin: Freitag, 08. Mai 2015, 14:00 Uhr

Ort: Englerstraße 11, 76131 Karlsruhe  
Kollegiengebäude am Ehrenhof (Geb. 11.40), 2. OG, Raum 231  
(Hinweise für Besucher: [www.aifb.kit.edu/web/Kontakt](http://www.aifb.kit.edu/web/Kontakt))

Veranstalter: Institut AIFB, Forschungsgruppe Effiziente Algorithmen

Zu diesem Vortrag lädt das Institut für Angewandte Informatik und Formale Beschreibungsverfahren alle Interessierten herzlich ein.

Andreas Oberweis, Hartmut Schreck (Org.), Detlef Seese, Wolffried Stucky, Rudi Studer