Graduiertenkolloquium Angewandte Informatik

A Heuristic-based Genetic Operator in Classifier Systems

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Abstract**:**
Accuracy-based Learning Classifier System (XCS) is an online genetic-based machine learning method introduced by Wilson in 1995. It learns by maintaining several rules called classifiers in form of an input-output pair, where the input is a series of "genetic" information.
XCS has the goals to learn the given task by responding to the environmental with a proper action and maximizing the awarded feedback.
It also aims to generalize the rules in the population in order to reduce the usage of resources, along with an effort to minimize the time requirement.

XCS employs genetic operators (i.e., crossover and mutation) to discover general and accurate rules. However, these techniques have some drawbacks due to some randomizations (e.g., when picking crossover points) that potentially slow down the discovery process. A heuristic-based genetic operator called Rule Combining (RC) is introduced to address this issue. Instead of involving some random values, it generalizes rules by performing inductive reasoning on a pair of experienced classifiers and creates a child based upon it. Experiments indicate that the RC technique improves the performance of the learning system in fulfilling the given tasks. Moreover, it requires less learning time and a significantly smaller number of classifiers than the classical XCS with either binary or real value inputs.

Termin: Freitag, 20. Juni 2012, 11:30 Uhr

Ort: Englerstraße 11, 76131 Karlsruhe
          Kollegiengebäude am Ehrenhof (Geb. 11.40), 2. OG, Raum 214
          (Hinweise für Besucher: www.aifb.kit.edu/Allgemeines/Besucher)

Veranstalter: Institut AIFB, Effiziente Algorithmen

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

Andreas Oberweis, Hartmut Schmeck (Org.), Detlef Seese, Wolffried Stucky, Rudi Studer, Stefan Tai