

## Guest Editor's Introduction: Artificial Intelligence

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Founded in 1993, ELEKTRIK: Turkish Journal of Electrical Engineering and Computer Sciences, has gradually become better known and is fast establishing itself as a research oriented publication outlet with high academic standards. In a modest attempt to advance this trend, this special issue of ELEKTRIK brings together five papers exemplifying the state of the art in artificial intelligence (AI). Written by experts, the papers are especially aimed at readers interested in gaining a better appraisal of the applications side of the AI enterprise. In all papers there is a strong emphasis on measuring the benefits of the proposed approaches in experimental contexts. The papers broadly fall into five actively researched, contemporary domains of AI: pattern recognition, genetic algorithms, fuzzy sets, intelligent design, and agents.

Alimoglu and Alpaydin study handwritten character recognition in their paper “Combining multiple representations for pen-based handwritten digit recognition.” Their insight is that patterns misclassified by different classifiers usually do not coincide, thus making it possible for a suitable combination to achieve better accuracy. By employing the notion of ‘cascading’—using a simple classifier for a majority of the patterns and submitting the rejects to a complex one—they carry out experiments that reinforce the conclusion that combining multiple classifiers improves recognition accuracy.

“Meta-genetic programming: Co-evolving the operators of variation,” contributed by Edmonds, proposes an extension of genetic programming whereby the genetic operators also co-evolve—a paradigm that the author dubs ‘meta-genetic programming’ (MGP). A collection of tests is carried out to assess the conditions of application of this representation. It is thought that MGP might give insights into genetic programming by explicating what sorts of operator are suitable at different phases of an algorithm.

Yazici, Petry, and Pendergraft offer a social/cultural outlook in their “Fuzzy modeling approach for integrated assessments using cultural theory.” Their fuzzy modeling scheme utilizes cultural theory—with roots in the works of well-known social philosophers and sociologists—to evaluate (environmental) policy decisions, e.g., deregulation of electric power production. It is suggested that the fuzzy set theory might play a crucial role in assessment modeling by encapsulating the uncertainties inherent in the problem domain.

Yoshioka, Sekiya, and Tomiyama present “An integrated design-object modeling environment: Plug-gable metamodel mechanism.” Their ultimate goal is to be able to support design object modeling (as is ubiquitous in engineering design) in a rich, integrated environment. A ‘metamodel’ mechanism is proposed to maintain consistency among assorted models, be it geometric, kinematic, control-theoretic, finite-element, etc. A prototype system and an example design of a warehouse cell are presented to demonstrate the benefits of the metamodel concept.

Finally, Oren delivers a brief appraisal of the ability to process knowledge in “Advances in computer and information sciences: From abacus to holonic agents.” His emphasis on agent technology and his enumeration of fruitful areas for future work make his contribution a useful, inspirational starting point.

Overall, it can be claimed that these works depict the richness of AI as an engineering discipline. I hope that the reader will appreciate both the contributions of the individual papers and their unifying characteristic—attention to detail and experimentation—as much as I did.

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