

Introduction to the Special Issue on Innovative Applications of Artificial Intelligence

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■ In this editorial we introduce the articles published in this special *AI Magazine* issue on innovative applications of artificial intelligence. Discussed are a pick-pack-and-ship warehouse-management system, a neural network in the fishing industry, the use of AI to help mobile phone users, building business rules in the mortgage lending business, automating the processing of immigration forms, and the use of the semantic web to provide access to observational datasets.

Innovative applications of artificial intelligence (AI) are all around us, but we don't always notice them. Pop culture often shows AI in clearly visible forms like a futuristic robot attempting to take over the earth. However, current applications of AI are often more difficult to detect because they are imbedded in existing products, processes, and services. We interact with and benefit from these AI applications in ways that most people never even notice. Luckily, the purpose of the conference on Innovative Applications of Artificial Intelligence (IAAI) is to discuss, document, and celebrate the successful applications of AI technologies. The papers presented at the conference provide compelling case studies of the value and impact of AI technology. We are very pleased to republish here a sample of the papers drawn from IAAI-07, which was held July 22–26, 2007, in Vancouver, British Columbia, Canada. These articles are extended versions of the papers presented at the conference.

In the first article, a pick-pack-and-ship warehouse-management system significantly improves worker productivity by using autonomous robots to move storage shelves to the worker, rather than having the worker go to the shelves. An installation for a large distribution center may require 500 or more vehicles. The first permanent installation of this system was deployed in the summer of 2006.

In the second article, a neural network is used to classify fish before filleting on the fishing boat where the fish were caught. An image of the fish is used to accept the fish for filleting, reject it as damaged, or recycle it because of improper orientation for filleting. Since the appearance of the fish can change by location or season, the systems are trained and validated by the ship crew using a graphical training interface. More than 30 systems have been deployed on seven fishing vessels in Norway and Iceland over the past three years.

In the third article, AI is used to help mobile phone users access and locate relevant content and services. Personalization technology is used to profile subscriber interests in order to automatically adapt mobile portals to their learned preferences. The technology was deployed with more than 40 mobile operators and millions of subscribers around the world.

In the fourth article, Fannie Mae enables mortgage lenders to build their own business rules that determine borrower eligibility for a variety of mortgage products. This is done using an easy to use administrative interface that allows lenders to build, test, and maintain their guidelines, rules, and rule sets. This allows lenders to originate more loans and reduce their cost for each loan.

In the fifth article, the Hong Kong government automates the processing of

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immigration forms for travel documents and identity forms and other document requests. The AI techniques that were used included rule-based processing, schema-based reasoning, AI clustering, case-based reasoning, data mining, and machine learning. This has been in use since February of 2007.

In the final article, a virtual solar-terrestrial observatory uses the semantic web to provide access to observational data sets from fields spanning upper atmospheric terrestrial physics to solar physics. To do this they designed an extensible ontology for solar-terrestrial physics. The virtual observatory is in use and issuing over four hundred data requests per day.

We hope you enjoy these articles and invite you to submit descriptions of your AI applications to the next IAAI conference.

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Research Center in upstate New York, where he has worked since 1985. His job is to invent or improve knowledge-based products and services. This often involves the application of artificial intelligence and related techniques. He has led the development of more than a dozen intelligent systems that are in use throughout the General Electric Company. Since 1998, he has been an adjunct professor at Rensselaer Polytechnic Institute, where he now teaches the class Applied Intelligent Reasoning Systems.

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