*Editorial Introduction to the Special Articles in the Fall Issue*

# Innovative Applications of Artificial Intelligence 2014

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■ *This issue features expanded versions of articles selected from the 2014 AAAI Conference on Innovative Applications of Artificial Intelligence (IAAI) held in Quebec City, Canada. We present a selection of four articles describing deployed applications plus two more articles that discuss work on emerging applications.*

The Innovative Applications of Artificial Intelligence conference was founded in 1989 to showcase the successful application of artificial intelligence technology to real-world problems and its deployment into the hands of end users. Since then, we have seen examples of AI applied to domains as varied as medicine, education, manufacturing, transportation, user modeling, and citizen science. The 2014 conference continued the tradition with a selection of 7 deployed applications describing systems in use by their intended end users, and 14 emerging applications describing works in progress.

This year's special issue on innovative applications features articles describing four deployed and two emerging applications. The articles include three different types of recommender systems, which may be as much of a critique of the role of technology in society as it is an indication of recent research trends. Modern technology provides us with access to an increasingly overwhelming array of choices ranging from dating options to software capabilities to movies. However, as a society, we prefer not to turn the power of choice over to an automated system, thereby creating demand for AI-based technologies such as recommenders.

The first two articles describe deployed recommender sys-

tems in two very different domains. Wayne Wobcke, Alfred Krzywicki, Yang Sok Kim, Xiongcai Cai, Michael Bain, Paul Compton, and Ashesh Mahida discuss the challenges of and solutions to abundance of choice in the face of limited information in the article A Deployed People-to-People Recommender System in Online Dating. The article also provides an excellent overview of the risks and concerns associated with deploying an automated system into a competitive business environment. Importantly, the authors share some of their acquired insight into both the differences and transitions between the research and commercial environments.

Wei Li, Justin Matejka, Tovi Grossman, and George Fitzmaurice then describe a recent expansion of Autodesk's popular AutoCAD software application in Deploying CommunityCommands: A Software Command Recommender System Case Study. This work starts with the observation that the number and complexity of commands available to users has grown steadily for almost 20 years, which creates a long learning curve for newer users. The article describes the development of a personalized command recommender based on the user's usage history. The authors address a number of important issues, such as making recommendations in the absence of history, the role of context, and user privacy.

In the third article, CiteSeerX: AI in a Digital Library Search Engine, Jian Wu, Kyle Williams, Hung-Hsuan Chen, Madian Khabsa, Cornelia Caragea, Suppawong Tuarob, Alexander Ororbia, Douglas Jordan, Prasenjit Mitra, and C. Lee Giles describe the key AI technologies that drive the well-known scholarly documents search engine. The article covers topics such as document classification, document de-duplication, author disambiguation, and document and citation clustering, among others. The authors also discuss the development of future capabilities for the search engine, including table and algorithm search.

The fourth article describes a unique application of AI to psychological evaluation. In THink: Inferring Cognitive Status from Subtle Behaviors, Randall Davis, David J. Libon, Rhoda Au, David Pitman, and Dana L. Penney discuss automated methods for evaluating the results of the clock drawing test, which is widely used to screen for a variety of cognitive disorders such as Alzheimer's disease or stroke. In this context, the AI methods contribute to both the science and practice of cognitive evaluation by scrutinizing the drawn clock far more carefully than otherwise possible. The authors discuss recent studies suggesting that the digitized version of the clock drawing test reveals more information about patients than previously recognized.

In the first of two emerging applications, Amos Azaria, Ariel Rosenfeld, Sarit Kraus, Claudia V. Goldman, and Omer Tsimhoni return to the theme of recommender systems in the article Advice Provision for Energy Saving in an Automobile Climate-Control

System. This work views the recommendation as an optimization problem, in which the demand that climate control places on an electric vehicle is balanced against the driver's comfort. The approach therefore focuses on modeling both energy consumption and driver comfort using data collected from real cars and drivers. Notably, the article uses the phrase "persuade a driver to reduce the energy consumption of the climate-control system," in recognition of the driver's power of choice and the system's goal of influencing the decision.

The special issue concludes with an article by Peter Z. Yeh, Deepak Ramachandran, Benjamin Douglas, Adwait Ratnaparkhi, William Jarrold, Ronald Provine, Peter F. Patel-Schneider, Stephen Laverty, Nirvana Tikku, Sean Brown, Jeremy Mendel, and Adam Emfield, called An End-to-End Conversational Second-Screen Application for TV Program Discovery. They describe a second-screen application that runs on mobile devices to provide a variety of capabilities not otherwise available through traditional television. The article describes the development capabilities such as question answering, search and recommendation of television programs, and a variety of controls all tied together through a natural language dialogue interface. The authors also discuss evaluation of their system's functionality and the impact of the dialogue system with user studies.

In the tradition of previous special issues on innovative applications of artificial intelligence, and consistent with the goals of the IAAI conference, the articles in this issue describe work that is strongly grounded in the needs of end users. We hope that you enjoy the articles, and that they both provide insight into the application development process and help to expand your view of what is possible with AI technology. We also invite you to submit a description of your next AI application to IAAI.

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