ICCBR-18 Workshop Proposal

Workshop on Synergies between CBR and Machine Learning

Brief Technical Description

This workshop will be dedicated to studying in-depth the possible synergies between case-based reasoning (CBR) and machine learning (ML). This workshop inherits and extends the scopes of the First Workshop on Synergies between CBR and Data Mining, held at ICCBR 2014 in Cork, and the Second Workshop on Synergies between CBR and Knowledge Discovery held at ICCBR 2016 in Atlanta. It can be considered as the third edition in this series.

The goals of this workshop are to:

- provide a forum for identifying important contributions and opportunities for research on combining CBR and machine learning,
- promote the systematic study of how to synergistically integrate CBR and machine learning, and
- showcase synergistic systems using CBR and machine learning.

Targeted Interests

This workshop should be of interest to anyone working with a combination of CBR, machine learning (ML), and knowledge discovery in their research. Many machine learning or knowledge discovery researchers actually use some kind of CBR in their systems – one of the most famous examples is IBM's Watson system. Moreover, many CBR researchers incorporate some form of machine learning or knowledge discovery processes in their systems. CBR has historical roots within machine learning as an instance-based learning approach, while knowledge discovery is also tightly coupled with machine learning. After many years of going separate ways, it would be interesting to have researchers from machine learning, knowledge discovery, and case-based reasoning come together to discuss how their research intersects. . This workshop is intended to draw participants from outside the CBR community. We also aim to educate CBR researchers about the knowledge discovery methods and techniques that could enhance their systems and to foster new ideas for synergistic systems through the opportunity for peer contact, discussion and feedback.

Publicity and Attendance

Advertisement will be by email announcements both to the CBR community and the machine learning community, LinkedIn postings, and other appropriate means. We expect participation from both communities. The first two editions of this workshop in 2014 and 2016 were very successful both in submissions and in attendance. We anticipate about 20 participants in this workshop. We do not propose to limit attendance.

Preliminary Program

The length of the workshop, either half day or full day, will be determined by the number of high-quality submissions received. The format will include: a brief introduction to the workshop; paper presentations; and a concluding round table discussion to identify future directions and initiate continuing discussions.

Contact Information for Workshop Co-Chairs

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Draft Call for Papers

At the core of CBR lies the ability of a system to learn from past cases. However, CBR systems often incorporate machine learning methods, for example, to organize their memory or to learn adaptation rules. In turn, machine learning systems often utilize CBR as a learning methodology, for example, through a common set of problems with the nearest-neighbor method and reinforcement learning. Meanwhile, the machine learning community, which is tightly coupled with machine learning, has historically included CBR among the types of instance-based learning.

This workshop will be dedicated to studying in-depth the possible synergies between case-based reasoning (CBR) and machine learning. It also aims at identifying potentially fruitful ideas for co-operative problem-solving where both CBR and machine learning researchers can compare and combine methods. In particular, new advances in machine learning may help CBR to advance its field of study and play a vital role in the future of machine learning. This third Workshop on Synergies between CBR and Machine Learning aims to:

- provide a forum for identifying important contributions and opportunities for research on combining CBR and machine learning,
- promote the systematic study of how to synergistically integrate CBR and machine learning,

- showcase synergistic systems using CBR and machine learning.

Some of the technical issues addressed, and potential outcomes of the workshop, are to identify the machine learning methods used in CBR, to categorize the problems addressed by machine learning in CBR, to propose methodological improvements to fit this context's needs, preferred types and methods, and guidelines to better develop CBR systems taking advantage of all machine learning research has to offer. Similarly, the workshop will identify the CBR methods used in machine learning, categorize the problems addressed by CBR in machine learning, propose methodological improvements to fit this context's needs, preferred types and methods, and guidelines to better develop machine learning systems taking advantage of all CBR research has to offer.

We welcome all those interested in the problems and promise of synergistically combining CBR and machine learning whether they belong to the CBR, or the machine learning community.

Topics of interest include (but are not limited to):

- Architectures for synergistic systems between CBR and machine learning
- Theoretical frameworks for synergistic systems between CBR and machine learning
- Memory structure mining in CBR
- Memory organization mining in CBR (decision tree induction, etc.)
- Case mining
- Feature selection in CBR
- Knowledge discovery in CBR (adaptation knowledge, meta-knowledge, etc.)
- Concept mining in CBR
- Image and multimedia mining in CBR
- Temporal mining in CBR
- Text mining in CBR
- Signal mining in CBR
- Web mining and CBR
- Process mining for Process-oriented CBR
- Nearest-neighbor systems and CBR
- Instance-based learning and CBR
- Reinforcement learning and CBR
- CBR and statistics
- CBR and statistical data analysis
- CBR in multi-strategy learning systems
- CBR and similarity and metric learning
- CBR and Big Data
- CBR and deep learning
- Application specific synergies between CBR and machine learning (medicine, bioinformatics, social networks, sentiment analysis, etc.)

Paper presentations will be interspersed with discussions in which we characterize, categorize, and discuss the synergies between CBR and machine learning. A wrap-up round table discussion will summarize the lessons learnt, issues identified, and future directions.

Submission Requirements

Submitted papers are limited to 10 pages in length.

All papers are to be submitted via the ICCBR-18 EasyChair system. Papers should be in Springer LNCS format. Author's instructions, along with LaTeX and Word macro files, are available at http://www.springer.de/comp/lncs/authors.html.

Submissions should be original papers that have not already been published elsewhere. However, papers may include previously published results that support a new theme, as long as all past publications are fully referenced.

Dates

- Submission Deadline: June 13, 2018
- Notification Date: June 25, 2018
- Camera-Ready Deadline: July 2, 2018
- Workshop Date: July 10-12, 2018

Workshop Web Site: http://cs.oswego.edu/~bichinda/iccbr18/workshop.html

Organizing Committee

Co-Chairs

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Committee Members (Tentative)