



IEEE CIS Newsletter, Issue 92, September 2020

Research Frontier | Educational Activities | Technical Activities  
CIS Conferences

## 2021 IEEE Frank Rosenblatt Award goes to James M. Keller



Keller graduated from the University of Missouri (Columbia) in 1978. His PhD was in pure mathematics, his speciality was commutative rings, his thesis was titled "Topics in the Theory of Graded Rings." He published one paper about this with his thesis advisor: Huckaba J. A. and Keller, J. M. (1981). "The integral closure of a graded ring," *Comm. in Algebra*, 9 (15), 1551-1558. On 7/21/2020 it had two citations.

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Jim Bezdek, 7/21/2020

## Research Frontier

### A Review of Off-Line Mode Dataset Shifts

Dataset shifts are present in many real-world applications since data generation is not always fully controlled and is subject to noise, degradation, and other natural variations. In machine learning, the lack of regularity in data can degrade performance by



breaching error constraints. Different methods have been proposed to solve shifting problems; however, shifts in off-line learning mode are not as well examined. Off-line shifts consist of problems where drifts occur only with unlabeled data. Most methods aimed at dataset shifts consider that new labeled data can be received after training, which is not always the case. Here, a review on dataset shift characteristics and causes is presented as a tool for the analysis and implementation of machine learning methods targeting off-line mode dataset shift problems. In this context, a relationship between statistical learning risk functions and error degradation due to variation in data distribution was straightforwardly derived. Moreover, this paper provides a consistent survey of recent popular machine learning methods that address off-line mode dataset shift problems, focusing on the main characteristics of unlabeled data shifts. [Read More](#)

Computational Intelligence Magazine, Aug. 2020

### Iterative Privileged Learning



While in the learning using privileged information paradigm, privileged information may not be as informative as example features in the context of making accurate label predictions, it may be able to provide some effective comments (e.g., the values of the auxiliary function) like

a human teacher on the efficacy of the learned model. In a departure from conventional static manipulations of privileged information within the support vector machine framework, this paper investigates iterative privileged learning within the context of gradient boosted decision trees (GBDTs). As the learned model evolves, the comments learned from privileged information to assess the model should also be actively upgraded instead of remaining static and passive. During the learning phase of the GBDT method, new DTs are discovered to enhance the performance of the model, and iteratively update the comments generated from the privileged information to accurately assess and coach the up-to-date model. The resulting objective function can be efficiently solved within the gradient boosting framework. Experimental results on real-world data sets demonstrate the benefits of studying privileged information in an iterative manner, as well as the effectiveness of the proposed algorithm. [Read More](#)

IEEE Transactions on Neural Networks and Learning Systems, Aug. 2020

### A Survey of Weight Vector Adjustment Methods for Decomposition-Based Multiobjective Evolutionary

## Algorithms

Multiobjective evolutionary algorithms based on decomposition (MOEA/D) have attracted tremendous attention and achieved great success in the fields of optimization and decision-making. MOEA/Ds work by decomposing the target multiobjective optimization problem (MOP) into multiple single-objective subproblems based on a set of weight vectors. The subproblems are solved cooperatively in an evolutionary algorithm framework. Since weight vectors define the search directions and, to a certain extent, the distribution of the final solution set, the configuration of weight vectors is pivotal to the success of MOEA/Ds. The most straightforward method is to use predefined and uniformly distributed weight vectors. However, it usually leads to the deteriorated performance of MOEA/Ds on solving MOPs with irregular Pareto fronts. To deal with this issue, many weight vector adjustment methods have been proposed by periodically adjusting the weight vectors in a random, predefined, or adaptive way. This article focuses on weight vector adjustment on a simplex and presents a comprehensive survey of these weight vector adjustment methods covering the weight vector adaptation strategies, theoretical analyses, benchmark test problems, and applications. The current limitations, new challenges, and future directions of weight vector adjustment are also discussed. [Read More](#)



*IEEE Transactions on Evolutionary Computation, Aug. 2020*

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## Technical Activities

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### Interview with Prof. Hussein Abbass, Fellow IEEE

#### Founding Editor in Chief, IEEE Transactions on Artificial Intelligence (IEEE TAI)

#### Can you tell us a little about IEEE TAI? How did it come into existence? Which Societies were involved?

IEEE CIS recognised the need for IEEE TAI a few years ago. The first steps started around 2017. From 2018-2019, the work on IEEE TAI grew exponentially until the journal was formally approved in February 2020 with four IEEE Societies as financial sponsors (IEEE CIS lead, IEEE CS, IEEE SMC, and IEEE SPS) and IEEE RAS as a technical sponsor. The submission system opened on 4 April, with the first paper submitted to the journal on the first day. Since then, we have a fantastic submission rate, and world class Associate Editors.

#### What is the scope of the IEEE TAI?

The IEEE Transactions on Artificial Intelligence (IEEE TAI) is a multidisciplinary journal publishing papers on theories and methodologies of Artificial Intelligence. Applications of Artificial Intelligence are also considered.

#### Some people are confused about the difference between AI and CI. How does that affect the scope of IEEE TAI and how would CI authors know they should/could submit to TAI? How can they know if their research is best suited to TAI or other CIS venues?

Noting that one of the most successful AI models today is neural networks, which is also one of the pillar technologies in CI, it does not come as a surprise to know that most members in IEEE CIS would be researching areas that fall within the scope of IEEE TAI. Maybe it is better to give concrete examples. A paper that is purely designing a new evolutionary multiobjective optimisation algorithm and evaluating it on benchmark optimisation problems is unlikely to be within the scope of IEEE TAI. A paper that designs an evolutionary multiobjective optimisation algorithm for a challenging problem in recommender systems, autonomous systems, autonomic computing, social choice, multi-agent negotiation, and/or learning algorithms is likely to be within the scope of IEEE TAI. A paper that is purely examining theoretical characteristics of fuzzy sets is unlikely to be within the scope of TAI. A paper examining the theoretical foundations of fuzzy logic for explainable AI is likely to be within the scope of TAI.

#### What is the submission process? What is the role of the EIC and the AE?

The submission process is the standard IEEE process. All IEEE Transactions work with the same rules and abide by the IEEE Publication Services and Products Board Operations Manual. Our submission website is <https://mc.manuscriptcentral.com/tai-ieee>. The EIC works with the Associate Editors to handle the workflow and ensure quality control.

#### How long is the review process expected to take?

Our target is six weeks to make the first decision. COVID-19, however, has been posing challenges for some reviewers to complete their reviews on time. Despite that, our average is 46 days to receive a decision. This is due to a wonderful team of AEs. We are always looking for good reviewers and I encourage the IEEE CIS community to register in the submission system to help IEEE TAI reviewing papers.

#### Any last comments?

AI is one of the hottest topics today. I encourage anyone working in AI to submit to IEEE TAI and claim the grounds as an AI researcher by publishing in the journal. Despite that TAI is only four months old, we have a relatively higher rejection rate than many well-established journals due to the demands on TAI. Therefore, please submit your best work to give it your best shot at publishing in the journal. If any reader is in doubt if their work fits IEEE TAI, email me at [ieee.tai.eic@gmail.com](mailto:ieee.tai.eic@gmail.com)

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## Educational Activities

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### IEEE Student Activities Virtual Event at WCCI 2020

Even though we could not have an in-person meeting during WCCI in July, the CIS Student Activities subcommittee organised a great virtual event, chaired by A/Prof. Bing Xue, with talks given by Prof. Bing Xue, Prof. Carlos A. Coello, Dr. Diana Siwiak, Prof. Ponnuthurai Nagarathnam Suganthan and Prof. Robi Polikar, and an off-line discussion session chaired by Dr. Keeley Crockett. Topics included an introduction to CIS and CIS student activities, helping your supervisor help you, what makes a good paper, what makes a good grant proposal, and research during the lockdown. The virtual event attracted a large number of participants with great support from Senior Members from the Society.

Thank you to all speakers and participants!

CIS Conferences

Due to the outbreak of the COVID-19 pandemic, dates and details of CIS sponsored conferences should be monitored closely. The situation is changing very quickly. Please consult the conference web pages frequently to obtain the latest information. You can find the most recent announcements and updates from all of our Society's conferences and events at https://cis.ieee.org/volunteer-resources/covid-19-notice as our organizers make decisions.

5th South-East Europe Design Automation, Computer Engineering, Computer Networks and Social Media Conference (SEEDA CECNSM 2020) Virtual Event 25-27 Sep. 2020

2020 International Conference on Process Mining (ICPM 2020) Virtual Event 5-8 Oct. 2020

2020 IEEE 7th International Conference on Data Science and Advanced Analytics (DSAA) Virtual Event 6-9 Oct. 2020

2020 Fourth International Conference on Intelligent Computing in Data Sciences (ICDS) Virtual Event 21-23 Oct. 2020

2020 Joint IEEE 10th International Conference on Development and Learning and Epigenetic Robotics (ICDL-EpiRob) Virtual Event 26-30 Oct. 2020

2nd International Conference on Industrial Artificial Intelligence (IAI) Shenyang, China 23-25 Oct. 2020

2020 IEEE International Conference on Computational Intelligence in Bioinformatics and Computational Biology (CIBCB) Virtual Event 27-29 Oct. 2020

7th International Conference on Behavioural and Social Computing (BESC) Bournemouth, UK 5-7 Nov. 2020

7th International Conference on Soft Computing and Machine Intelligence (ISCMi) Stockholm, Sweden 14-15 Nov. 2020

2020 IEEE Symposium Series on Computational Intelligence (IEEE SSCI 2020) Virtual Event 1-4 Dec. 2020

2020 IEEE Smart World Conference (IEEE SWC 2020) Melbourne, Australia 8-10 Dec. 2020

2021 IEEE Smart World Conference Atlanta, USA 18-21 Oct. 2021

Paper submission deadline: 30 April 2021

2021 IEEE Latin American Conference on Computational Intelligence (LACCI) Temuco, Chile 2-4 Nov. 2021

2022 IEEE World Congress on Computational Intelligence (IEEE WCCI) Padua, Italy July 18-23, 2022

CIS sponsors and co-sponsors a number of conferences across the globe.

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