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IEEE Transactions on Emerging Topics in Computational Intelligence

Special Issue on Adversarial Learning in Computational Intelligence

I. Aim and Scope

Adversarial learning has recently attracted tremendous attention in the community of machine learning over the past few years. It normally integrates two components that contest with each other in a two-player zero-sum game. Since its birth in 2014, adversarial learning has been widely applied to not only the generation of realistic images, but also many other research topics such as data augmentation and domain adaptation, often leading to appealing performance.

However, we have just witnessed the very early rise of this technique, and still confront many challenges, for examples, the training instability problem, the mode collapse problem, the lack of standard evaluation metrics, and the interpretability of its results and failures. Computational intelligence (CI) technologies (e. g., fuzzy logic, artificial neural networks, evolutionary computation, learning theory, and probabilistic methods) are expected to provide potential and efficient solutions to deal with the raised challenges. Moreover, most of the previous adversarial-learning works are largely limited in addressing static images, feature vectors or observations. It still remains largely an open question of how adversarial learning performs for other complex and temporally variational signals or modalities, such as speech and text.

Given the above premises, this special issue aims to i) capture the most recent advances of adversarial learning in CI from both the theoretical and empirical perspectives; ii) present its novel applications in CI to other domains beyond computer vision, including, but not limited to, audio/speech/video analysis and synthesis, natural language processing/generation, as well as biomedical engineering and health informatics.

II. Topics of Interest

The topics of interest for this special issue include, but are not limited to:

- Interpretable Generative Adversarial Networks (GANs) and their variants
- Fuzzy logic for interpretable GANs
- CI-based methods (e. g., neuro-fuzzy) for novel structures of adversarial networks
- Learning theory for adversarial learning
- Evolutionary computing for adversarial learning
- Evolutionary models for adversarial learning
- Novel objective functions for adversarial learning
- Domain adversarial training
- Adversarial attack and defense
- Virtual adversarial training
- Unsupervised and semi-supervised representation learning with adversarial learning
- CI-based methods to improve the training stability of adversarial learning
- CI-based methods to overcome the mode collapse of adversarial learning
- Evaluation metrics to assess the quality of generated data
- Style conversion with adversarial learning
- Data augmentation via GANs
- Adversarial learning for speech synthesis, speech conversion, and music generation
- Adversarial learning for audio, speech, and music analysis and recognition
- Adversarial learning for natural language understanding and generation
- Adversarial learning for image and video generation and translation
- Adversarial learning for affective computing, biomedical engineering, and health informatics

III. Important Dates

- Manuscript submission: **May 15, 2019**
- Notification of Review Results: July 30, 2019
- Submission of Revised Manuscripts: September 30, 2019
- Final editorial decision: November 15, 2019

IV. Submission

Manuscripts should be prepared according to the "Information for Authors" section of the journal, and submissions should be done through the journal submission website: https://mc.manuscriptcentral.com/tetci-ieee, by selecting the Manuscript Type of "Adversarial Learning in Computational Intelligence" and clearly marking "Adversarial Learning in Computational Intelligence Special Issue Paper" as comments to the Editor-in-Chief. Submitted papers will be reviewed by at least three different reviewers. Submission of a manuscript implies that it is the authors' original unpublished work and is not being submitted for possible publication elsewhere.

V. Guest Editors

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