Computational Intelligence Society
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IEEE CIS Newsletter, Issue 61, February 2018 (Online Version)

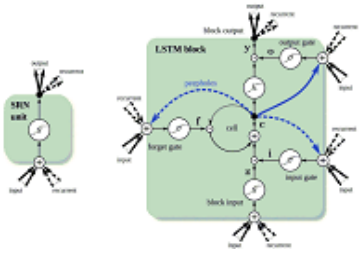
Research Frontier

Machine Learning for Performance Prediction in Mobile Cellular Networks

In this paper, we discuss the application of machine learning techniques for performance prediction problems in wireless networks. These problems often involve using existing measurement data to predict network performance where direct measurements are not available. We explore the performance of existing machine learning algorithms for these problems and propose a simple taxonomy of main problem categories. As an example, we use an extensive real-world drive test data set to show that classical machine learning methods such as Gaussian process regression, exponential smoothing of time series, and random forests can yield excellent prediction results. Applying these methods to the management of wireless mobile networks has the potential to significantly reduce operational costs while simultaneously improving user experience. We also discuss key challenges for future work, especially with the focus on practical deployment of machine learning techniques for performance prediction in mobile wireless networks.

IEEE Computational Intelligence Magazine, Feb. 2018

LSTM: A Search Space Odyssey



Several variants of the long short-term memory (LSTM) architecture for recurrent neural networks have been proposed since its inception in 1995. In recent years, these networks have become the state-of-the-art models for a variety of machine learning problems. This has led to a renewed interest in understanding the role and utility of various computational components of typical LSTM variants. In this paper, we present the first large-scale analysis of eight LSTM variants on three representative tasks: speech recognition, handwriting recognition, and polyphonic music modeling. The hyperparameters of all LSTM variants for each task were optimized separately using random search, and their importance was assessed using the powerful functional ANalysis Of VAriance framework. In total, we summarize the results of 5400 experimental runs (≈15 years of CPU time), which makes our study the largest of its kind on LSTM networks. Our results show that none of the variants can improve upon the standard LSTM architecture significantly, and demonstrate the forget gate and the output activation function to be its most critical components. We further observe that the studied hyperparameters are virtually independent and derive guidelines for their efficient adjustment.

IEEE Transactions on Neural Networks and Learning Systems, Oct. 201

Important Message

Proposals for IEEE CEC or FUZZ-IEEE in 2021

Proposals for the organization of IEEE CEC or FUZZ-IEEE in 2021 must be submitted as soon as possible, and no later than **Mar. 15**. Policies, procedures and budget worksheet for such proposals are available. More detailed guidelines can be obtained upon request to Bernadette Bouchon-Meunier.

CIS Conferences

Conference Calendar (2018-2019)

2018 IEEE Conference on Computational Intelligence in Bioinformatics and Computational Biology (CIBCB 2018)
Missouri, USA
May 30-Jun. 2, 2018

2018 IEEE International Conference on Computational Intelligence and Virtual Environments for Measurement Systems and Applications (CIVEMSA 2018)
Ottawa, Canada
Jun. 12-14, 2018
(Submission: Feb. 4)

on Computational Intelligence (WCCI 2018)

Generalized Adaptive Fuzzy Rule Interpolation

It has been developed on the assumption that contradictions may only be resulted from the underlying interpolation mechanism, and that all the identified candidates are not distinguishable in terms of their likelihood to be the real culprit. However, this assumption may not hold for real-world situations. This paper, therefore, further develops the adaptive method by taking into account observations, rules, and interpolation procedures, all as diagnosable and modifiable system components. In addition, given the common practice in fuzzy systems that observations and rules are often associated with certainty degrees, the identified candidates are ranked by examining the certainty degrees of its components and their derivatives. From this, the candidate modification is carried out based on such ranking. This study significantly improves the efficacy of the existing adaptive system by exploiting more information during both the diagnosis and modification processes.

IEEE Transactions on Fuzzy Systems, Aug. 2017

5 Minutes with Prof. Bernadette Bouchon-Meunier

IEEE CIS Student Activities Subcommittee invites you to get to know the pioneers and experts in the Computational Intelligence. This month "5 minutes with..." focuses on pioneer **Prof. Bernadette Bouchon-Meunier**.

1. What is your title, full name, and place of work?
   Dr. Bernadette Bouchon-Meunier, Director of Research Emeritus at the CNRS (National Center for Scientific Research) - Sorbonne University, Paris, France
2. What grade of member in CIS are you?
   Life Fellow
3. How long have you been a member of CIS?
   I have been an IEEE member for 36 years and a CIS member since its inception.
4. One reason why you are a member of CIS:
   I have been working on fuzzy and intelligent systems for more than 40 years and CIS is the best place to exchange information and meet specialists on these topics.
5. What was your service pathway in the Computational Intelligence Society?
   I have been a member of the CIS Fuzzy Systems Technical Committee since 2003, chairing it in 2011-2012, I was elected a member of the CIS Adcom several times between 2004 and July 2014. I chaired the Women in Computational Intelligence Committee from 2004 to 2007 and I am still a member of this committee, happy to support women in our field. I chaired the IEEE France Section CIS chapter from 2007 to 2015. I was elected CIS Vice-President for Conferences in July 2014 and re-elected since then.
6. Can you share with us one success story that will motivate young members and provide useful guidelines for their careers?
   My first research field was Information theory. In 1975, I worked on a cooperative project with a group of sociologists who were looking for a formal model for the questionnaires they used. I discovered Lotfi Zadeh's seminal paper on fuzzy sets by chance, in the library of mathematics of the university. I was sur
   matched my needs. It was the starting point of years of researcl
   systems and also the first of a long list of multidisciplinary collaborations. Of course, documentary research is much easier now that we have all papers on line but it is

Rio de Janeiro, Brazil
Jul. 8-13, 2018
(Submission: Feb. 1)

- 2018 IEEE Conference on Computational Intelligence and Games (CIG 2018)
  Maastricht, The Netherlands
  Aug. 14-17, 2018
  (Submission: Mar. 15)
- 2018 Joint IEEE International Conference on Developmental Learning and Epigenetic Robotics (ICDL-EpiRob 2018)
  Tokyo, Japan
  Sep. 17-20, 2018
  (Submission: Apr. 1)
- 2018 IEEE Smart World Congress (SmartWorld 2018)
  Guangzhou, China
  Oct. 8-12, 2018
- 2018 IEEE Latin American Conference on Computational Intelligence (LA-CCI 2018)
  Guadalajara, Mexico
  Nov. 7-9, 2018
- 2018 IEEE Symposium Series on Computational Intelligence (SSCI 2018)
  Bangalore, India
  Nov. 18-21, 2018
- 2018 IEEE International Conference on Data Science and Advanced Analytics (DSAA 2018)
  Turin, Italy
  Dec. 1-3, 2018
- 2019 IEEE Congress on Evolutionary Computation (CEC 2019)

also difficult because of the huge number of available documents. My recommendation would be not to have blinders on, to be curious, to collaborate with others. Mutidisciplinarity is enriching. Research out of your main stream may be fruitful. However, keep your own path and don't get lost in the numerical world.

Read more

Editor

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Call for Papers (Journal)

- IEEE CIM Special Issue on Computational Intelligence for Affective Computing and Sentiment Analysis (Mar 31)
- IEEE CIM Special Issue on Deep Reinforcement Learning and Games (Oct 1)
- IEEE TEVC Special Issue on Theoretical Foundations of Evolutionary Computation (Oct 1)
- IEEE TETCI Special Issue on Computational Intelligence for Smart Energy Applications to Smart Cities (May 15)
- IEEE TETCI Special Issue on New Advances in Deep-Transfer Learning (Jun 30)

Call for Papers (Conference)

- WCCI 2018 Workshop on the Ethics and Social Implications of Computational Intelligence (Feb 1)
- WCCI 2018 Special Session on Memetic Computing (Feb 1)
- WCCI 2018 Special Session on Computational Intelligence for Music, Art, and Creativity (Feb 1)
- WCCI 2018 Special Session on Computational Intelligence for the Automated Design of Machine Learning and Search (Feb 1)
- WCCI 2018 Special Session on Evolutionary Computation in Healthcare Industry (Feb 1)
- WCCI 2018 Special Session on When Evolutionary Computation Meets Data Mining (Feb 1)
- WCCI 2018 Special Session on Computational Intelligence methods for Natural Language Processing (Feb 1)
- WCCI 2018 Special Session on the Role of Computational Intelligence Technologies in Controlling Borders (Feb 1)
- WCCI 2018 Special Session on Computational Intelligence for Bioinformatics and Computational Biology (Feb 1)
- WCCI 2018 Special Session on Evolutionary Computation in Dynamic and Uncertain Environments (Feb 1)
- WCCI 2018 Special Session on Computational Intelligence for Cognitive-Cyber-Physical Autonomous Systems (Feb 1)
- WCCI 2018 Special Session on Evolutionary Computation in Complex Optimization in the Energy Domain (Feb 1)
- WCCI 2018 Special Session on Differential Evolution: Past, Present and Future (Feb 1)
- WCCI 2018 Special Session on Computational Intelligence to Data Engineering and Its Applications to Real-World Problems (Feb 1)
- WCCI 2018 Special Session on Evolutionary Multi-objective Op… Decomposition (Feb 1)
- WCCI 2018 Special Session on Recent Advances in Evolutionary Computation for Permutation Problems (Feb 1)
- WCCI 2018 Special Session on Nature-Inspired Constrained Optimization (Feb 1)

- WCCI 2018 Special Session on Parallel and Distributed Evolutionary Computation in the Inter-Cloud Era (Feb 1)
- WCCI 2018 Special Session on Fireworks Algorithm and Its Applications (Feb 1)
- WCCI 2018 Special Session on Brain Storm Optimization Algorithms (Feb 1)
- WCCI 2018 Special Session on Evolutionary Computation for Feature Selection, Extraction and Dimensionality Reduction (Feb 1)
- WCCI 2018 Special Session on Transfer Learning in Evolutionary Computation (Feb 1)
- WCCI 2018 Special Session on Computational Intelligence for Sensing and Predicting Human Mental and Medical State (Feb 1)
- WCCI 2018 Special Session on Nature-inspired Design, Evolution, and Optimization of Intelligent Systems (Feb 1)
- WCCI 2018 Special Session on Evolutionary Methods and Machine Learning in Software Engineering, Testing and SE Repositories (Feb 1)
- WCCI 2018 Special Session on Interpretable Deep Learning Classifiers (Feb 1)
- WCCI 2018 Special Session on Blockchain Research and Applications (Feb 1)
- IEEE Conference on Evolving and Adaptive Intelligent Systems (EAIS 2018) (Feb 4)
- Pacific Rim International Conference on Artificial Intelligence (PRICAI 2018) (Mar 31)
- International Workshop on Semantic and Social Media Adaptation and Personalization (SMAP 2018) (Apr 23)

Career Opportunities

- Post-Doctoral Senior Research Associate in Computer Vision and Intelligent Systems, Lancaster University, UK (Feb 25)
- Post-Doctoral Research Associate at Vision Lab, Old Dominion University, USA
- PhD Scholarship in EECS, South Dakota State University, USA (Feb)
- 15 PhD Scholarships at KIOS Research and Innovation Center of Excellence, University of Cyprus (Feb 28)