Computational Intelligence Society
Nature-Inspired Problem Solving • cis.ieee.org
IEEE

IEEE CIS Newsletter, Issue 59, December 2017 (Online Version)

2018 IEEE World Congress on Computational Intelligence

Call for Papers / Special Sessions / Tutorials / Competitions / Workshops

The IEEE World Congress on Computational Intelligence (IEEE WCCI) is the largest technical event in the field of computational intelligence. The IEEE WCCI 2018 will host three conferences: The 2018 International Joint Conference on Neural Networks (IJCNN 2018), the 2018 IEEE International Conference on Fuzzy Systems (FUZZ-IEEE 2018), and the 2018 IEEE Congress on Evolutionary Computation (IEEE CEC 2018). It encourages cross-fertilization of ideas among the three big areas and provides a forum for intellectuals from all over the world to discuss and present their research findings on computational intelligence.

IEEE WORLD CONGRESS ON COMPUTATIONAL INTELLIGENCE
WCCI 2018
Rio de Janeiro, Brazil | July 8-13, 2018

A list of proposals can be found at Special Sessions, Competitions, and Panel Sessions.

Paper submission is open! Click on the links to submit papers: **IJCNN**, **FUZZ-IEEE**, **CEC**.

Important Dates:

- Special Session & Workshop Proposals Deadline: Dec 15, 2017
- Tutorial & Competition Proposals Deadline: Dec 15, 2017
- Paper Submission Deadline: Jan 15, 2018

For more information, please visit http://www.ieee-wcci.org/.

Research Frontier

Insights on Transfer Optimization: Because Experience is the Best Teacher

This paper sheds light on recent research advances in the field of global black-box optimization that champion the theme of automatic knowledge transfer across problems. We introduce a general formalization of transfer optimization, based on which the conceptual realizations of the paradigm are classified into three distinct categories, namely sequential transfer, multitasking, and multiform optimization. In addition, we carry out a survey of different methodological perspectives spanning Bayesian optimization and nature-inspired computational intelligence procedures for efficient encoding and transfer blocks. Finally, real-world applications of the techniques are identified, d future impact of optimization engines that evolve as better problem-solvers over time by learning from the past and from one another.

Important Message

Proposals for IEEE CIS Conferences in 2019

Proposals for the organization of IEEE CIS financially sponsored conferences in 2019 must be submitted as soon as possible, and no later than **Dec. 31, 2017**. (Details)

Call for Senior Member Applications

The IEEE CIS Senior Members Subcommittee encourages you to consider applying to become a Senior Member, and we can assist you with the senior member promotion. (Details)

CIS Conferences

- Conference Calendar (2017-2018)
- 2018 IEEE Conference on Computational Intelligence in Bioinformatics and Computational Biology (CIBCB 2018)
  Missouri, USA
  May 30-Jun. 2, 2018
  (Submission: Dec. 23)
- 2018 IEEE International Conference on Computational Intelligence and Virtual Environments for Measurement Systems and Applications (CIVEMSA 2018)

IEEE Transactions on Emerging Topics in Computational Intelligence, Feb. 2018

An Intelligent Packing Programming for Space Station Extravehicular Missions

Packing programming for extravehicular missions to the space station is the process of arranging a set of missions into multiple extravehicular activities. It is an interesting combinatorial optimization problem developed from the traditional bin-packing problem. This paper first formulates a practical mathematical model that considers both the constraints of the time window for each extravehicular mission and the spacewalk time per astronaut. An Ant Colony Optimization (ACO) algorithm with a self-adaptation strategy and a new pheromone matrix characterizing the relationship between any two extravehicular missions is then proposed. The simulation results on various independent experiments show that the proposed ACO algorithm is capable of producing optimal packing programming schemes with a success rate of over 90%, which is acceptable for application to real-world problems.

IEEE Computational Intelligence Magazine, Nov. 2017

Simplify Your Covariance Matrix Adaptation Evolution Strategy

The standard covariance matrix adaptation evolution strategy (CMA-ES) comprises two evolution paths, one for the learning of the mutation strength and one for the rank-1 update of the covariance matrix. In this paper, it is shown that one can approximately transform this algorithm in such a manner that one of the evolution paths and the covariance matrix itself disappear. That is, the covariance update and the covariance matrix square root operations are no longer needed in this novel so-called matrix adaptation (MA) ES. The MA-ES performs nearly as well as the original CMA-ES. This is shown by empirical investigations considering the evolution dynamics and the empirical expected runtime on a set of standard test functions. Furthermore, it is shown that the MA-ES can be used as a search engine in a bi-population (BiPop) ES.

IEEE Transactions on Evolutionary Computation, Oct. 2017

Behavior-Based SSVEP Hierarchical Architecture for Telepresence Control of Humanoid Robot to Achieve Full-Body Movement

The challenge to telepresence control a humanoid robot through a steady-state visual evoked potential (SSVEP) based model is to rapidly and accurately control full-body movement of the robot because a subject has to synchronously recognize the complex natural environments based on live video feedback and activate the proper mental states by targeting the visual stimuli. To mitigate this problem, this paper presents a behavior-based hierarchical architecture, which coordinates a large number of robot behaviors using only the most effective five stimuli. We defined and implemented fourteen robot behaviors for motion control and object manipulation, which were encoded through the visual stimuli of SSVEPs into four behavioral sets. We proposed switch mechanisms in the hierarc coordinate these behaviors and control the full-body movement of a NAO humanoid robot. To improve operation performance, we investigated the individual sensitivities of visual stimuli and

Ottawa, Canada
Jun. 12-14, 2018
(Submission: Feb. 4)

- 2018 IEEE World Congress on Computational Intelligence (WCCI 2018)
  Rio de Janeiro, Brazil
  Jul. 8-13, 2018
  (SS/Wksp Proposal: Dec. 15)
  (Paper Submission: Jan. 15)
- 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
- 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)
  Wellington, New Zealand
  Jun. 10-13, 2019

Editor

Taiwan
Email: ckting@cs.ccu.edu.tw

allocated the stimuli targets according to frequency-responsive properties of individual subjects.

IEEE Transactions on Cognitive and Developmental Systems, Jun. 2017

5 Minutes with Dr. Piero P. Bonissone

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 **Dr. Piero P. Bonissone**.

1. What is your title, full name, and place of work?
   Dr. Piero P. Bonissone, Piero P Bonissone Analytics LLC, CEO
2. What grade of member in CIS are you?
   I am an IEEE Life Fellow.
3. How long have you been a member of CIS?
   I have been a member of the IEEE since 1975 and a member of CIS since its inception in 2002. At that time our society was named IEEE Neural Networks Society (NNS), and it became IEEE CIS the following year. Still, 2002 was the first year we had a Society. I remember it because I was the IEEE NNS president at the time.
4. One reason why you are a member of CIS.
   It is the best home for thousands of researchers and practitioners in fuzzy, neural, and evolutionary computation. To the best of my knowledge, it is also the only place where we strive to integrate and synergize these mature computing paradigms, while at the same time we are an incubator for emerging CI technologies.
5. What was your service pathway in the Computational Intelligence Society?
   I have devoted a large part of my professional career to the IEEE CIS, starting in 1993 as VP of Finances of the IEEE Neural Networks Council (NNC), the precursor to the NNS and CIS societies. After eight years in that position, I had the honor of supervising our transition from Council to Society, by becoming President Elect of the IEEE NNC, President of the IEEE NNS, and Past President of the IEEE CIS. Since then, I have been a member of the IEEE CIS AdCom. During this period of time, I organized many IEEE CIS conferences and congresses, chaired numerous committees, and gave invited talks to various IEEE CIS chapters.
6. Give one interesting fact about yourself:
   I was born in Italy, lived seven years in Mexico, where I did my undergraduate studies, and moved to the USA to pursue my PhD at UC Berkeley. So, when I have to multiply two numbers I think in Italian (as the multiplication tables were burnt in that language in my brain's EPROMs); when I need to use calculus, such as taking the derivative of a function, I think in Spanish (because that is the language in which I learned the derivative rules); and when I need to use other types of math or CS, I think in English. Sometimes I use more than one language in my dreams.

Read more

Technical Activities

IEEE Global Initiative on Ethics of Autonomous and Intelligent Systems

The IEEE Global Initiative on Ethics of Autonomous and Intelligent Syste
launching the second version of its paper, Ethically Aligned Design: A Vision for Prioritizing Human Well-Being with Autonomous and Intelligent Systems on Dec. 12.

Launched in April of 2016, the goal of The IEEE Global Initiative is to incorporate ethical aspects of human well-being that may not automatically be considered in the current design and manufacture of A/IS technologies.

Along with evolving Ethically Aligned Design, members of The IEEE Global Initiative have recommended eleven Standards Working Groups, including: **IEEE P7000™** – Model Process for Addressing Ethical Concerns During System Design that outlines an approach for identifying and analyzing potential ethical issues in a system or software program from the onset of the effort.

Discussions on collaborations with The IEEE Global Initiative through the IEEE CIS Task Force on Ethics and Social Impact of Computational Intelligence have already begun and IEEE CIS members are encouraged to join any IEEE P7000 Working Groups now.

More info on all P7000 Working Groups available on The IEEE Global Initiative's Website.

Educational Activities

Prize Winners in Game Competitions at CIG 2017

17 game competitions/tracks have been organised at the IEEE 2017 Conference on Computational Intelligence and Games (CIG 2017). According to the Game Competition Award Policy, the student/young professional winners, 1st runner-ups and 2nd runner-ups of 9 competitions/tracks have been awarded prizes of USD 500, 300 and 200, respectively. More about the winners and qualified competitions can be found here.

Call for Papers (Journal)

- IEEE CIM Special Issue on Computational Intelligence in Finance and Economics (Dec 31)
- 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 TETCI Special Issue on Computational Intelligence in Data-Driven Optimization (Jan 31)
- IEEE TG Special Issue on Game Competition Frameworks for Research and Education (Jan 8)

Call for Papers (Conference)

- WCCI 2018 Special Session on Memetic Computing (Jan 15)
- WCCI 2018 Special Session on Computational Intelligence for M Creativity (Jan 15)
- WCCI 2018 Special Session on Computational Intelligence for the Automated Design of Machine Learning and Search (Jan 15)

- WCCI 2018 Special Session on Evolutionary Computation in Healthcare Industry (Jan 15)
- WCCI 2018 Special Session on When Evolutionary Computation Meets Data Mining (Jan 15)
- WCCI 2018 Special Session on Computational Intelligence methods for Natural Language Processing (Jan 15)
- WCCI 2018 Special Session on the Role of Computational Intelligence Technologies in Controlling Borders (Jan 15)
- WCCI 2018 Special Session on Computational Intelligence for Bioinformatics and Computational Biology (Jan 15)
- WCCI 2018 Special Session on Evolutionary Computation in Dynamic and Uncertain Environments (Jan 15)
- IEEE International Conference on Innovative Smart Grid Technologies (ISGT Asia 2018) (Dec 30)
- IEEE Conference on Evolving and Adaptive Intelligent Systems (EAIS 2018) (Jan 20)
- International Conference on Advanced Computational Intelligence (ICACI 2018) (Dec 15)
- International Symposium on Neural Networks (ISNN 2018) (Jan 15)
- International Conference on Information Science and Technology (ICIST 2018) (Feb 1)

Call for Participation

- Subreddit: Computational Intelligence Courses
- Webinar: Decomposition Based Multiobjective Evolutionary Computation – Qingfu Zhang (Dec 18)
- International Conference on Agents and Artificial Intelligence (ICAART), Madeira, Portugal (Jan 16-18)

Career Opportunities

- Professor of Data Analytics (2 posts), Ulster University, UK (Dec 8)
- Reader/Senior Lecturer in Data Analytics (3 posts), Ulster University, UK (Dec 8)
- Lecturer in Data Analytics (3 posts), Ulster University, UK (Dec 8)
- Research Associate in Machine Learning for Brain fMRI, University of Sheffield, UK (Dec 15)
- 12 PhD Scholarships in Intelligent Games and Game Intelligence, UK (Jan 31)
- Faculty Positions at All Levels in Computing at UL Lafayette, USA (Open until Filled)
- PhD Scholarship in EECS, South Dakota State University, USA (Feb)