



Research Frontier

Hierarchical Change-Detection Tests

We present hierarchical change-detection tests (HCDDTs), as effective online algorithms for detecting changes in datastreams. HCDDTs are characterized by a hierarchical architecture composed of a detection layer and a validation layer. The detection layer steadily analyzes the input datastream by means of an online, sequential CDT, which operates as a low-complexity trigger that promptly detects possible changes in the process generating the data.



The validation layer is activated when the detection one reveals a change, and performs an offline, more sophisticated analysis on recently acquired data to reduce false alarms. Our experiments show that, when the process generating the datastream is unknown, as it is mostly the case in the real world, HCDDTs achieve a far more advantageous tradeoff between false-positive rate and detection delay than their single-layered, more traditional counterpart.

IEEE Transactions on Neural Networks and Learning Systems, Feb. 2017

Deep Neural Network for Structural Prediction and Lane Detection in Traffic Scene

Hierarchical neural networks have been shown to be effective in learning representative image features and recognizing object classes. However, most existing networks combine the low/middle level cues for classification without accounting for any spatial structures. For applications such as understanding a scene, how the visual cues are spatially distributed in an image becomes essential for successful analysis.



This paper extends the framework of deep neural networks by accounting for the structural cues in the visual signals. In particular, two kinds of neural networks have been proposed. First, we develop a multitask deep convolutional network, which simultaneously detects the presence of the target and the geometric attributes (location and orientation) of the target with respect to the region of interest. Second, a recurrent neuron layer is adopted for structured visual detection.

IEEE Transactions on Neural Networks and Learning Systems, Mar. 2017

Brain-Machine Interface and Visual Compressive Sensing-Based Teleoperation Control of an Exoskeleton Robot

This paper presents a teleoperation control for an exoskeleton robotic system using a brain-machine interface and vision feedback. Vision compressive sensing-based reference commands, and adaptive fuzzy controllers in joint-space have been effectively integrated to enable the robot performing manipulation tasks guided by human operator's

Important Message

★ Nomination for Distinguished Lecturer

The IEEE CIS DLP committee invites all Society's Technical Committees Chairs, Chapter Chairs, EiCs, and AdCom / ExCom members to nominate Distinguished Lecturers (2018-2020). The nominations should be received by **Aug. 30**. ([Details](#))

CIS Conferences

★ Conference Calendar (2017-2018)

★ 2017 IEEE Congress on Evolutionary Computation (CEC 2017)
San Sebastián, Spain
Jun. 5-8, 2017

★ 2017 IEEE International Conference on Computational Intelligence and Virtual Environments for Measurement Systems and Applications (CIVEMSA 2017)
Annecy, France
Jun. 26-28, 2017

★ 2017 IEEE International Conference on Fuzzy Systems (FUZZ-IEEE 2017)

Jul. 9-12, 2017



mind. First, a visual-feedback link is implemented by a video captured by a camera, allowing him/her to visualize the manipulator's workspace and movements being executed. Then, the compressed images are used as feedback errors in a nonvector space for producing steady-state visual evoked potentials electroencephalography (EEG) signals, and it requires no prior information on features in contrast to the traditional visual servoing. The proposed EEG decoding algorithm generates control signals for the exoskeleton robot using features extracted from neural activity.



IEEE Transactions on Fuzzy Systems, Feb. 2017

Hybrid Pathfinding in StarCraft

Micromanagement is a very important aspect of real-time strategy (RTS) games. It involves moving single units or groups of units effectively on the battle field, targeting the most threatening enemy units and use the unit's special abilities when they are the most harmful for the enemy or the most beneficial for the player. Designing good micromanagement is a challenging task for AI bot developers. In this paper, we address the micromanagement subtask of positioning units effectively in combat situations. Two different approaches are evaluated, one based on potential fields and the other based on flocking algorithms. The results show that both the potential fields version and the flocking version clearly increases the win percentage of the bot, but the difference in wins between the two is minimal. The results also show that the more flexible potential fields technique requires much more hardware resources than the more simple flocking technique.



IEEE Transactions on Computational Intelligence and AI in Games, Dec. 2016

Educational Activities

IEEE CIS 2017 Competition: "Telling a Story: How your Computational Intelligence Research benefits Society and Humanity"

Launch Date: May 1, 2017
 Closing Date: Oct. 1, 2017
 Category 1: Best Video
 Category 2: Best Interactive Tutorial / Demo
 Prizes are for each category: \$500 / \$300 / \$200 USD
 (sponsored by IEEE CIS)

A core purpose of the IEEE Computational Intelligence Society is to foster technological innovation and excellence for the benefit of society and humanity. As student members of the Society, your research is fundamental to the future of technological developments that can make a difference to people's lives. The IEEE Computational Intelligence Society invites you to tell your own research story using any type of artefact which must be accessible online i.e. (a short video presentation (max 5 minutes), an online game, an interactive piece of software which demos your work etc. The Artefact must be able to explain the main ideas to pupils aged 14-18 and convey why working in the field of computational intelligence our everyday lives and be used to inspire others.

[Read more](#)

2017 IEEE Smart World Congress (SWC 2017)
 San Francisco, USA
 Aug. 4-8, 2017

★ 2017 IEEE Conference on Computational Intelligence and Games (CIG 2017)
 New York, USA
 Aug. 22-25, 2017

★ 2017 IEEE Conference on Computational Intelligence in Bioinformatics and Computational Biology (CIBCB 2017)
 Manchester, UK
 Aug. 23-25, 2017

★ Seventh Joint IEEE International Conference on Developmental Learning and Epigenetic Robotics (ICDL-EpiRob 2017)
 Lisbon, Portugal
 Sep. 18-21, 2017

★ 2017 IEEE International Conference on Data Science and Advanced Analytics (DSAA 2017)
 Tokyo, Japan
 Oct. 19-21, 2017
 (Submission: Jun. 8)

★ 2017 IEEE Latin American Conference on Computational Intelligence (LA-CCI 2017)
 Arequipa, Peru
 Nov. 8-10, 2017
 (Submission: Jun. 12)

★ 2017 IEEE Symposium Series on Computational Intelligence (SSCI 2017)
 Hawaii, USA
 Nov. 27-Dec. 1, 2017
 (Submission: Jul. 16)

on Computational Intelligence (WCCI 2018)



Rio de Janeiro, Brazil
Jul. 8-13, 2018
(SS/Wksp Proposal: Dec. 15)

 Editor

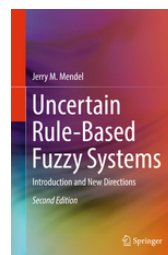
Chuan-Kang Ting
National Chung Cheng University
Taiwan
Email: ckting@cs.ccu.edu.tw

New Book

Uncertain Rule-Based Fuzzy Systems: Introduction and New Directions, 2nd Edition

by Jerry M. Mendel

- Presents fully updated material on new breakthroughs in human-inspired rule-based techniques for handling real-world uncertainties
- Allows those already familiar with type-1 fuzzy sets and systems to rapidly come up to speed to type-2 fuzzy sets and systems
- Features complete classroom material including more than 250 end-of-chapter exercises, a solutions manual (soon to be available), and three case studies -- forecasting of time series, knowledge mining from surveys, and PID control



Call for Papers

- IEEE CIM Special Issue on Automated Design of Machine Learning and Search Algorithms (Jul 15)
- IEEE CIM Special Issue on Computational Intelligence Techniques in Bioinformatics and Bioengineering (Nov 15)
- IEEE TETCI Special Issue on Data Driven Computational Intelligence for e-Governance, Socio-Political and Economic Systems (Jun 5)
- IEEE TETCI Special Issue on Computational Intelligence for End-to-End Audio Processing (Jun 26)
- IEEE TETCI Special Issue on New Trends in Smart Chips & Smart Hardware (Aug 1)
- IEEE TETCI Special Issue on Human-Machine Symbiosis (Sep 3)

- IEEE Symposium on Adaptive Dynamic Programming and Reinforcement Learning (ADPRL'17) (Jul 2)
- IEEE Symposium on Computational Intelligence and Data Mining (CIDM'17) (Jul 16)
- IEEE Symposium on Computational Intelligence in Dynamic and Uncertain Environments (CIDUE'17) (Jul 16)
- IEEE International Conference on Cyborg and Bionic Systems (ICBS 2017) (Jun 15)
- International Symposium on Computational and Business Intelligence (ISCBI 2017) (Jun 10)
- International Conference on Agents and Artificial Intelligence (ICAART 2018) (Jul 31)
- International Conference on Behavioral, Economic, and Socio-Cultural Computing (BESC 2017) (Jun 5)



Call for Participation

- [International Symposium on Neural Networks \(ISNN 2017\)](#), Sapporo, Japan (Jun 21-23)
 - [International Workshop on Self-Organizing Maps and Learning Vector Quantization, Clustering and Data Visualization \(WSOM+ 2017\)](#), Vandœuvre-lès-Nancy, France (Jun 28-30)
 - [International Workshop on Semantic and Social Media Adaptation and Personalization \(SMAP 2017\)](#), Bratislava, Slovakia (Jul 9-10)
 - [International Conference on Data Science, Technology and Applications \(DATA 2017\)](#), Madrid, Spain (Jul 24-26)
 - [International Conference on Swarm Intelligence \(ICSI 2017\) & International Conference on Data Mining and Big Data \(DMBD 2017\)](#), Fukuoka, Japan (Jul 27-Aug 1)
 - [IEEE SMC Workshop on Brain-Machine Interface Systems \(SMC 2017\)](#), Banff, Canada (Oct 5-8)
-

Career Opportunities

- [Assistant Professor in Intelligent Business Analytics Systems, Netherlands \(Jun 15\)](#)
- [Scientia PhD Scholarship at UNSW, Australia \(Jun 30\)](#)

[Privacy & Opting Out of Cookies](#) | [Terms & Conditions](#) | [Nondiscrimination Policy](#) | [Subscribe](#) | [Unsubscribe](#)

A non-profit organization, IEEE is the world's largest professional association for the advancement of technology.

© Copyright 2017 IEEE - All rights reserved. Use of this newsletter site signifies your agreement to the terms and conditions.