



IEEE CIS Newsletter, Issue 90, July 2020

Research Frontier

Change Detection in Graph Streams by Learning Graph Embeddings on Constant-Curvature Manifolds

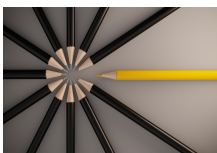
The space of graphs is often characterized by a nontrivial geometry, which complicates learning and inference in practical applications. A common approach is to use embedding techniques to represent graphs as points in a conventional



Euclidean space, but non-Euclidean spaces have often been shown to be better suited for embedding graphs. Among these, constant-curvature Riemannian manifolds (CCMs) offer embedding spaces suitable for studying the statistical properties of a graph distribution, as they provide ways to easily compute metric geodesic distances. In this paper, we focus on the problem of detecting changes in stationarity in a stream of attributed graphs. To this end, we introduce a novel change detection framework based on neural networks and CCMs, which takes into account the non-Euclidean nature of graphs. Our contribution in this paper is twofold. First, via a novel approach based on adversarial learning, we compute graph embeddings by training an autoencoder to represent graphs on CCMs. Second, we introduce two novel change detection tests operating on CCMs. We perform experiments on synthetic data, as well as two real-world application scenarios: the detection of epileptic seizures using functional connectivity brain networks and the detection of hostility between two subjects, using human skeletal graphs. Results show that the proposed methods are able to detect even small changes in a graph-generating process, consistently outperforming approaches based on Euclidean embeddings. [Read More](#)

IEEE Transactions on Neural Networks and Learning Systems, June 2020

Feature Extraction and Selection for Parsimonious Classifiers With Multiobjective Genetic Programming



The objectives of this paper are to investigate the capability of genetic programming to select and extract linearly separable features when the evolutionary process is guided to achieve the same and to propose an integrated system for that.

We decompose a c -class problem into c binary classification problems and evolve c sets of binary classifiers employing a steady-state multiobjective genetic programming with three minimizing objectives. Each binary classifier is composed of a binary tree and a linear support vector machine (SVM). The features extracted by the feature nodes and some of the function nodes of the tree are used to train the SVM. The decision made by the SVM is considered the decision of the corresponding classifier. During crossover and mutation, the SVM-weights are used to determine the usefulness of the corresponding nodes. We also use a fitness function based on Golub's index to select useful features. To discard less frequently used features, we employ unfitness functions for the feature nodes. We compare our method with 34 classification systems using 18 datasets. The performance of the proposed method is found to be better than 432 out of 570, i.e., 75.79% of comparing cases. Our results confirm that the proposed method is capable of achieving our objectives. [Read More](#)

IEEE Transactions on Evolutionary Computation, Jun. 2020

Member Activities

Call for Nomination of Distinguished Lecturers

The Committee of the Distinguished Lecturer Program (DLP) of the IEEE CIS Society invites all Society's Technical Committees Chairs, Chapter Chairs, EICs, and AdCom/ExCom members to nominate Distinguished Lecturers. 10 exceptionally outstanding IEEE CIS members will be selected among the nominees to serve as the DLs for the three-year term of 2021-2023. The nominations should be received by no later than 30 August 2020.

The nomination form, procedure, policies and criteria for the Selection of DL Lecturers are available at the following

URL: <https://cis.ieee.org/professional-development/dlp/nominating-and-appointing-dls>

IEEE Women in Computational Intelligence Virtual Event

Careers in Computational Intelligence: How to inspire women of all ages

<https://wcci2020.org/ieee-women-in-computational-intelligence-virtual-event/>

Date: Thursday, 23 July 2020

Time (tentative): 2pm - 3.30pm UK Time

Location: Zoom meeting room

Please register to join us for a special IEEE WCCI event for Women in Computational Intelligence (Registration will open soon).

The virtual event will comprise a series of short talks with participant questions and a series of discussion activities in breakout rooms.

All are welcome.

Speakers

- Dr Keeley Crockett - Introduction to IEEE CIS Women in Computational Intelligence
 - Prof. Bernadette Bouchon-Meunier - VP for IEEE Computational Intelligence Society
 - Dr Lisa Lazarek-Asunta - IEEE Women in Engineering Chair
 - Prof. Julia Chung - IEEE CIS - High School Outreach Sub-committee
 - Prof. Sharon Devivo - IEEE TryEngineering and the Educational Activities Board Portal

Breakout room activities including:

- What attracted you to a career in AI / CI?
 - What do you think would attract young female engineers?
 - What volunteer STEM work with girls have you participated in?

Educational Activities

IEEE Student Activities Virtual Event at WCCI 2020

<https://wcci2020.org/student-activities-event/>

Monday, 20 July 2020
 from 14:00 - 15:30 (UK time)

Please register (registration link will open shortly) to join us for a special virtual student event hosted on Zoom. All are welcome.

Chair: Prof Bing Xue

Speakers:

Prof. Bing Xue Introduction to IEEE CIS Student Activities

Prof. Carlos A. Coello Coello: Introduction to CIS

Dr Diana Siviak: Helping your Supervisor Help You
 Prof. Ponnuthurai Nagarathnam Suganthan - What makes a good paper?

Prof. Robi Polikar: What makes a good grant proposal?

Open Discussion Topic: Research in Lockdown - share your experiences Chaired by Dr Keeley Crockett

Close: Prof Bing Xue

Call for 2020 CI High School Education

This "Call for 2020 CI High School Education" is to encourage the organization of education programs on Computation Intelligence techniques, including the theory and related applications for high school students. Any CIS Member or Student member can apply for the partial support from CIS for organizing education activities for high school students. An accepted application will be supported about US\$2K for organizing the activity. For application details, please refer to the High School Outreach Education website:

<https://cis.ieee.org/professional-development/high-school-outreach-subcommittee>

Technical Activities

Questionnaire on Real-World Optimization Problems

In order to align research in Evolutionary Computation more closely to the needs arising from the real world, the questionnaire at <https://tinyurl.com/opt-survey> collects information on properties of real-world optimization problems. To get a thorough understanding of the wide variety of real-world problems, participation from anyone working on such problems will be very greatly appreciated. Results and analysis of the questionnaire will be made publicly available on the accompanying website (<https://sites.google.com/view/macoda-rwp>). The questionnaire was prepared by the participants of the Lorentz Center workshop on Many Criteria Optimization and Decision Analysis held in September 2019 in Leiden, the Netherlands.

IEEE Transactions on AI -- Call for Papers and Special Issues (to include in the newsletter until August)

IEEE Transactions on Artificial Intelligence (IEEE TAI) invites impactful Artificial Intelligence research, survey articles, and applications. Submit your manuscript at the IEEE TAI Manuscript Central website at <https://mc.manuscriptcentral.com/tai-ieee>. Potential authors should consult the Information to Authors Document at <https://cis.ieee.org/publications/ieee-transactions-on-artificial-intelligence/information-for-authors-tai>. Further questions can be directed to the Founding Editor-in-Chief at ieee.tai.ec@gmail.com

IEEE TAI is also currently accepting proposals for special issues on contemporary and hot topics in AI. Instructions on how to prepare a proposal for a special issue could be found at

<https://cis.ieee.org/publications/ieee-transactions-on-artificial-intelligence/special-issues>

Webpage: <https://cis.ieee.org/publications/ieee-transactions-on-artificial-intelligence/>

Submission: <https://mc.manuscriptcentral.com/tai-ieee>

Proposals to Organize CIS Conferences in 2022

Proposals for the organization of IEEE CIS sponsored conferences in 2022 must be submitted by 1 August 2020. Please inform Marley Vellasco (marley@ele.puc-rio.br) and Gary Yen (gyen@okstate.edu) of your intention to prepare a bid as soon as you decide to do so. Policies, procedures and budget worksheet for such proposals are available here (<https://cis.ieee.org/conferences/application-packet-for-ieee-cis-sponsored-conferences>).

Proposals to Organize CIS Conferences in 2023

Proposals for the organization of IEEE CEC 2023, FUZZ-IEEE 2023 and IEEE SSCI 2023 must be submitted by 15 September 2020. Please inform (marley@ele.puc-rio.br) and Gary Yen (gyen@okstate.edu) of your intention to prepare a bid as soon as you decide to do so. Policies, procedures and budget worksheet for such proposals are

available here(<https://cis.ieee.org/conferences/application-packet-for-ieee-cis-sponsored-conferences>).

Obituary Note

Prof. Ashok Deshpande passed away on 21 May 2020.

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.



2020 IEEE World Congress on Computational Intelligence (IEEE WCCI 2020)

Place: Glasgow, UK
19-24 July 2020

2020 Joint IEEE 10th International Conference on Development and Learning and Epigenetic Robotics (ICDL-EpiRob)

Valparaiso, Chile
7-10 Sep. 2020

2020 IEEE Conference on Games (CoG)

Higashiosaka, Japan
24-27 Aug. 2020

5th South-East Europe Design Automation, Computer Engineering, Computer Networks and Social Media Conference (SEEDA CECNSM 2020)

Corfu, Greece
25-27 Sep. 2020

2020 International Conference on Process Mining (ICPM 2020)

Padua, Italy
5-8 Oct. 2020

(Submission: 24 June 2020)

2020 IEEE 7th International Conference on Data Science and Advanced Analytics (DSAA)

Sydney, Australia
6-9 Oct. 2020

2020 Fourth International Conference on Intelligent Computing in Data Sciences (ICDS)

Fez, Morocco
21-23 Oct. 2020

2nd International Conference on Industrial Artificial Intelligence (IAS)

Shenyang, Liaoning, China
23-25 Oct. 2020

(Submission: 20 June 2020)

2nd International Conference on Industrial Artificial Intelligence (IAI)

Shenyang, China
23-25 Oct. 2020

(Submission: 20 June 2020)

2020 IEEE International Conference on Computational Intelligence in Bioinformatics and Computational Biology (CIBCB)

Viña del Mar, Chile
27-29 Oct. 2020

7th International Conference on Behavioural and Social Computing (BESC)

Bournemouth, UK
5-7 Nov. 2020

(Submission: 31 July 2020)

7th International Conference on Soft Computing and Machine Intelligence (ISCM)

Stockholm, Sweden
14-15 Nov. 2020

(Submission: 25 June 2020)

2020 IEEE Symposium Series on Computational Intelligence (IEEE SSCI 2020)

Canberra, Australia
1-4 Dec. 2020

(Submission: 7 Aug. 2020 -- strict deadline)

2020 IEEE Smart World Conference (IEEE SWC 2020)

Melbourne, Australia
8-10 December 2020

(Submission: 31 July 2020)

2021 IEEE Smart World Conference

Atlanta, USA
18-21 Oct. 2021

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

[View Full Schedule](#)

Call For Papers

(IEEE Journal Special Issues)

- IEEE TNNLS Special Issue on Adaptive Learning and Control for Autonomous Vehicles (30 Jul)
- IEEE TCDS Special Issue on Artificial Intelligence and Edge Computing for Trustworthy Robots and Autonomous Systems (1 Sept)
- IEEE TEVC Special Issue on Evolutionary Computation Meets Deep Learning (1 Sept)

- IEEE TNNLS Special Issue on New Frontiers in Extremely Efficient Reservoir Computing (15 Sept)
- IEEE TNNLS Special Issue on Biologically Learned/Inspired Methods for Sensing, Control and Decision Making (31 Oct)
- IEEE TFS Special Issue on Fuzzy Systems Toward Human-Explainable Artificial Intelligence and Their Applications (31 Oct)
- IEEE TEVC Special Issue on Multi-task Evolutionary Computation (1 Nov)
- IEEE TCDS Special Issue on Emerging Topics on Development and Learning (15 Jan 2021)

Call for Papers (Conference)

- 9th International Conference on the Theory and Practice of Natural Computing (TPNC 2020) (25 July), <https://rdta.eu/tpnc2020/>
- 14th International Conference of Thailand Econometric Society (31 Jul), <https://tes.econ.cmu.ac.th>
- 4th International Conference on Financial Econometrics, (31 Jul), <http://hcm-hn.conference-econ-buh-bav-ris.tn>
- Second International Conference on Artificial Intelligence and Computational Intelligence AICI'2021 (15 Aug), <https://aici2021.iot.ac.vn>
- BNAIC/BeneLearn 2020 (28 Aug), www.bnaic.eu
- 2020 International Conference on Soft Computing and Machine Learning (SCML 2020) (30 Aug) www.icscm.org
- ICONIS2020: International Conference on Innovation and Sustainability 2020 (30 Sept), <https://easychair.org/dsp/ICONIS2020>

Call for Participation (Conference)

- Annual Conference of the North American Fuzzy Information Processing Society NAFIPS'2020, Redmond, 20-22 August, 2020, <https://nafips2020.digipen.edu/>
- International Conference on Innovations in Intelligent Systems and Applications (INISTA 2020), 24-26 August 2020, Novi Sad, Serbia, <http://inista.org/index.html>
- 14th International Conference on Applications of Fuzzy Systems, Soft Computing and Artificial Intelligence Tools (ICAFS 2020), 27-28 August 2020, Budva, Montenegro, <https://icafs2020.com/Registration.htm>
- IntellLang - Intelligent Information Processing and Natural Language Generation, 29 August 2020, Santiago de Compostela, Spain, <https://intellang.github.io/>
- 1st TAILOR Workshop (TAILOR- Foundations of Trustworthy AI - Integrating Learning, Optimization and Reasoning), 29-30 August 2020, Santiago de Compostela, Spain, <https://liu.se/en/research/tailor/workshop>
- European Conference on Artificial Intelligence - ECAI 2020, August 29 - September 2, Santiago de Compostela, Spain, <http://ecai2020.eu/>
- 15th Conference on Computer Science and Information Systems (FedCSIS 2020), 6-9 September 2020, Sofia, Bulgaria, <https://fedcsis.org/>
- International Student Conference on Applied Mathematics and Informatics (ISCAMI 2020), 8-11 September 2020, Malenovice, Czech Republic, <https://irafm.osu.cz/iscami/>
- The Second International Workshop on Higher Education Learning Methodologies and Technologies Online - HELMeTo2020, 17-18 September 2020, Bari, Italy, <https://www.helmto2020bari.com/>
- The Workshop on Natural Computing (WNC), 20-22 September 2020, Oravská Lesná, Slovakia, <https://tat.ics.upjs.sk/index.php?id=ws/WNC>
- The 14th International FLINS Conference on Robotics and Artificial Intelligence (FLINS 2020), September 30-October 3, 2020, Cologne, Germany, <https://www.bhm-bildung.de/flins2020/>
- The 10th International Conference on the Internet of Things (IoT 2020), 6-9 October 2020, Malmö University, Malmö (Sweden), <https://iot-conference.org/iot2020>
- International Symposium on Bioinformatics and Biomedicine (ISBB), 8-10 October 2020, Burgas, Bulgaria, <http://bioinfomed.org/>
- 24th International Conference on Intuitionistic Fuzzy Sets (ICIFS-2020), October 8-9, 2020, Burgas, Bulgaria. <http://ifigenia.org/wiki/ICIFS-2020>
- 19th Mexican International Conference on Artificial Intelligence, 12-17 October 2020, Mexico City, Mexico <http://www.micai.org/2020/>
- 12th International Joint Conference on Computational Intelligence, 2-4 November, online conference, <http://www.ijcc.org/>
- 7th International Conference on Soft Computing & Machine Intelligence (ISCMi 2020), 14-15 November 2020, Stockholm, Sweden, <http://iscmi.us/index.html>
- the International Conference on Information Technologies (ICIT-2020), 3-4 December 2020, Yuri Gagarin State Technical University of Saratov, Russia, <http://icit2020.sstu.ru/eng/index.html>
- Thirty-fourth Conference on Neural Information Processing Systems, NeurIPS 2020, December 5-12 2020, Online Event, <https://nips.cc/Conferences/2020/>

Career Opportunities

- Seven Postdoctoral Fellow in Artificial Intelligence at Victoria University of Wellington (Job Ref 2000024) (31 July)
- New Bioinformatics and Computational Biology phd program. More information at <http://bcb.vsb.cz/en/bioinformatics-and-computational-biology#BCBintro>

This global health crisis is a unique challenge that has impacted many members of the IEEE family. These are difficult times, but we will get through them by working together. Thank you for your support of our shared mission to advance technology for humanity.

Editor

Leandro L. Minku
University of Birmingham, UK
Email: l.l.minku@cs.bham.ac.uk

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