

**The 18th IEEE International Conference on Machine Learning and Applications
(IEEE ICMLA-2019)**

**Special Session: Topological Data Analysis in Machine Learning
December 16-19, 2019, Boca Raton, Florida, USA**

<https://www.icmla-conference.org/icmla19/>

Introduction

Topological Data Analysis (TDA) is an emerging area in computational topology where research is centered on the development of methodologies to study the “shape” of point cloud data. Specifically, TDA offers a principled approach for the analysis of high-dimensional large volume data sets through the methods of topological compression and persistence homology. As of late, TDA has found applications in bioinformatics, remote sensing, data mining, and computer vision, to name a few. This special session will serve as a venue for researchers to publish innovative state-of-the-art hybrid TDA/ML based learning systems for unsupervised and semi-supervised learning. The goal is to develop novel approaches for the extraction of topological features/summaries of data that can be exploited in learning systems to enhance performance and provide mechanisms to model system interpretability. Submitted papers are expected to present novel research with a practical study or novel application based on topological data analysis or a survey of the literature.

Scope

This special session invites submissions on recent advances, approaches, theories and applications related to topological data analysis. Topics covered by this session include but are not limited to:

- High-dimensional Data Visualization
- Explainable Artificial Intelligence
- Unsupervised Learning
- Semi-Supervised Learning
- Manifold Learning
- Hierarchical Clustering
- Algorithms for and applications of persistence homology
- TDA applications in bio-informatics, health care data, imaging and video
- TDA applications in natural language processing
- TDA applications for Big Data Analytics
- TDA applications in air and underwater acoustics

Submission Guidelines and Instructions

Papers submitted for reviewing should conform to IEEE specifications. Manuscript templates can be downloaded from [IEEE website](#). The maximum length of papers is 8 pages. All the papers will go through double-blind peer review process. Authors' names and affiliations should not appear in the submitted paper. Authors' prior work should be cited in the third person. Authors should also avoid revealing their identities and/or institutions in the text, figures, links, etc.

Papers must be submitted via the [CTM System](#) by selecting the track "Special Session on Topological Data Analysis in Machine Learning". All accepted papers must be presented by one of the authors, who must register. Detailed instructions for submitting papers can be found at [How to Submit](#).

Paper Publication:

Accepted papers will be published in the ICMLA 2019 conference proceedings (published by IEEE). A selected number of accepted papers will be invited for possible inclusion, in an expanded and revised form, in some journal special issues.

Important Dates:

Submission Deadline: September 7, 2019

Notification of Acceptance: October 7, 2019

Camera-ready papers & Pre-Registration: October 17, 2019

Special Session Organizers

- 1) Dr. Juan Ramirez Jr., Juan.Ramirez@us.kbr.com, KBR Inc.
- 2) Dr. Emilie Purvine, Emilie.Purvine@pnnl.gov, Pacific Northwest National Laboratory
- 3) Dr. Derek Doran, Derek.Doran@wright.edu, Wright State University
- 4) Dr. Ryan Kramer, Ryan.Kramer.3@us.af.mil, Air Force Research Laboratory, 711th Human Performance Wing
- 5) Dr. Michael L. Raymer, Michael.Raymer@wright.edu, Wright State University

Program Committee:

- 1) Dr. Trevor Bihl, Air Force Research Laboratory, Sensors Directorate
- 2) Dr. Bei Wang, University of Utah
- 2) Dr. Justin M. Curry, University at Albany, State University of New York
- 3) Dr. Jeffrey S. Rogers, Defense Advanced Research Projects Agency (DARPA)
- 4) Dr. Yusu Wang, The Ohio State University
- 5) Dr. Gunnar Carlsson, Ayasdi Inc. and Stanford University
- 6) Dr. Boris Goldfarb, University at Albany, State University of New York
- 7) Dr. Alice Patania, Indiana University Network Science Institute
- 7) Dr. Paul Havig, Air Force Research Laboratory (AFRL), 711th Human Performance Wing
- 8) Dr. Fairul Mohad-Zaid, Air Force Research Laboratory (AFRL), 711th Human Performance Wing
- 9) Dr. Facundo Mémoli, The Ohio State University
- 10) Dr. Michael Robinson, American University
- 11) Dr. Paul L. Bendich, Geometric Data Analytics Inc., and Duke University
- 12) Dr. Jose Perea, Michigan State University
- 13) Dr. Henry Adams, Colorado State University
- 14) Dr. Kevin C. Gross, Air Force Institute of Technology
- 15) Dr. Gregory Henselman, Princeton University