Haibin Hang

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Education

Florida State University, USA   *August 2014 - Jun 2020 (expected)*

Program:	Ph.D. in Mathematics
Advisor:	Washington Mio
Dissertation:	Correspondence Modules, Persistence Sheaves and Stability of Their Diagrams

Capital Normal University, China   *August 2011 - Jun 2014*

Program:	Master in Mathematics
Advisor:	Xuezhi Zhao
Dissertation:	Homology and Orientation Reversing Periodic Maps on Surfaces

Hebei University, China   *August 2007 - Jun 2011*

Program:	Bachelor, Mathematics and Applied Mathematics

Research Interests

Topological and geometric data analysis; object-oriented data analysis; statistics on graphs and manifolds; scientific and practical applications; low-dimensional topology.

Publications

5. H. Hang, L. Dong, J. G. Park, W. Mio, R. Liang, Detecting Carbon Nanotube Orientation with Topological Data Analysis of Scanning Electron Micrographs. (In preparation)

4. H. Hang, W. Mio, Correspondence Modules, Persistence Sheaves and Stability of Their Diagrams. (In preparation)

3. H. Hang, F. Mémoli, W. Mio, A topological study of functional data and Fréchet functions of metric measure spaces. J Appl. and Comput. Topology (2019).
https://doi.org/10.1007/s41468-019-00037-8

2. H. Hang, F. Mémoli, W. Mio, Covariance tensors on Riemannian manifolds, Oberwolfach Reports, Workshop on Statistics for Data with Geometric Structure (2018).
https://doi.org/10.4171/OWR/2018/3

1. H. Hang, Homology and orientation reversing periodic maps on surfaces, Topology and its Applications, 229 (2017), 1-19.
https://doi.org/10.1016/j.topol.2017.06.023

Talks and Conferences

Conference Talks

- Stability of a Multi-Parameter Persistent Homology Approach to Functional and Structural Data, AMS Special Session on Topological Data Analysis, Jan 2019.

- A Stable Transformation from Structural Data to Functional Data, UF/FSU Topology and Geometry Meeting, Feb 2019.

Invited Seminar Talks

- What is a zigzag module with continuous index?, Topology, Geometry and Data Seminar in Ohio State University, Sep 2019.

Geometry, Topology and Data Seminar at FSU

- Correspondence Modules and Persistence Sheaves, Sep 2019.

- Computing persistent homology, Feb 2019.

- Multiscale Covariance Tensors for Data on Riemannian Manifolds, Apr 2017.

- The structure and stability of persistence modules, Spring 2017.

Topology Seminar at FSU

- A norm for the homology of 3-manifolds, Oct 2015.

- On fibering certain 3-manifolds, Sep 2015.

- The loop theorem, Apr 2015.

Conferences Attended

- The 1st Midwest Graduate Student Conference: Geometry and Topology meet Data Analysis and Machine Learning, Ohio State University, Jun 2019

- TGDA@OSU TRIPODS Center Workshop on"Structure in the Micro-World" Ohio State University, May 2019

- UF/FSU Topology and Geometry Meeting, Florida State University, Feb 2019

- Joint Mathematics Meetings, Baltimore, Jan 2019.

- TGDA@OSU TRIPODS Center Summer School and Workshop on"Theory and Foundations of TGDA", Ohio State University, May 2018

- First Chicago Summer School in Geometry and Topology, University of Chicago, Jun 2015

Professional Experience

- Research Assistant, May 2016—present

  Research Projects:
  Multiscale Covariance Tensors for Data on Riemannian Manifolds;
  Multi-Parameter Persistent Homology Approach to Functional and Structural Data;
  Study of Ginkgo Leaf Phenotypic Plasticity Using Topological Data Analysis;
  Detecting Carbon Nanotube Orientation with Topological Data Analysis of SEM Images;
  Correspondence Modules and Persistence Sheaves.

- Teaching assistant, Aug 2014—May 2016
  –Proctor of computer assisted instruction for Liberal Arts Math, College Algebra, Business
  Calculus, Trigonometry, Precalculus.
  –Prepared for and managed labs.
  –Helped students review course materials in office hours.

Services and Outreach

- Volunteer, Annual FSU Math Fun Day, 2015, 2019

- Volunteer, Fun Math Class in Tallahassee Chinese School, Fall 2016

Programming Languages and Software

- Languages: Matlab; Python; C++; Latex; Html

- Software: Javaplex; Gudhi; OpenCV