

## Harish Chintakunta

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## EMPLOYMENT

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### Assistant Professor of Electrical Engineering

Januray 2016 - Present

Florida Polytechnic University  
4700, Research way,  
Lakeland, FL 33805

### Post-doctoral researcher

Oct 2014 - Oct 2015

*Coordinated Science Laboratory  
University of Illinois, Urbana Champaign  
1308 W Main Street, Urbana, IL 61801-2307*  
Supervisor: Dr. Yuliy Baryshnikov

### Post-doctoral researcher

Jun 2013 - Sep 2014

*Department of Electrical and Computer Engineering,  
North Carolina State University,  
3114 Engineering Building II,  
890 Oval Drive, Raleigh, NC 27606*  
Supervisor: Dr. Hamid Krim

## EDUCATION

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### PhD in Electrical Engineering

May 2013

*North Carolina State University*  
Dissertation: Topology and Geometry of Sensor Networks: A distributed computing approach.

### M.S in Electrical Engineering

May 2008

*North Carolina State University*  
Concentration: Communication systems - physical layer, information theory, estimation and detection theory

### B.Tech in Electronics and Communication Engineering

May 2006

*Indian Institute of Technology, Roorkee.*

## RESEARCH

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My research areas include a) data analytics, natural language processing and linguistics with focus on health informatics, b) graph theory and topological data analysis with focus on social networks, sensor networks, power grids and signal processing in general, and c) distributed algorithms, data acquisition and transmission over wireless sensor networks. In general, I try not to pin myself down on one specific area, and go where the applications take me.

## PUBLICATIONS

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Preprints and links to the papers below are available on my website.

### Journals:

- [1] Jennifer Gamble, **Harish Chintakunta**, and Hamid Krim. [Node Dominance: Revealing Community and Core-Periphery Structure in Social Networks](#). IEEE Transactions on Signal and Information Processing over Networks (TSiPN). 2016
- [2] Hamid Krim, Thanos Gentimis, and **Harish Chintakunta**. [Discovering the Whole by the Coarse: A topological paradigm for data analysis](#). IEEE Signal Processing Magazine. 2016
- [3] Jennifer Gamble, **Harish Chintakunta**, and Hamid Krim. [Coordinate-Free Quantification of Coverage in Dynamic Sensor Networks](#). Signal Processing. 2015
- [4] **Harish Chintakunta** and Hamid Krim. [Distributed localization of coverage holes using Topological Persistence](#). IEEE Transactions on Signal Processing (TSP). 2014
- [5] **Harish Chintakunta**, Thanos Gentimis, Rocio Gonzalez Diaz, Dr., Maria-Jose Jimenez, and Hamid Krim. [An entropy based persistent barcode](#). Special issue on Graph based representation (Gbr2013), Pattern Recognition. 2014

### Conferences:

- [6] **Harish Chintakunta**, and Athanasios Gentimis. [Influence of topology in information flow in social networks](#). Annual Asilomar Conference on Signals, Systems, and Computers (ASILOMAR). 2016
- [7] Yang Chen, **Harish Chintakunta**, Yuliy Baryshnikov and P.R. Kumar. [Persistent-Homology-based Detection of Power System Low-frequency Oscillations using PMUs](#). IEEE Global Conference on Signal and Information Processing (GlobalSIP) 2016
- [8] **Harish Chintakunta**, Michael Robinson, and Hamid Krim. [Introduction to the special session on Topological Data Analysis](#). IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP). 2016

- [9] Jennifer Gamble, **Harish Chintakunta**, and Hamid Krim. [Emergence of Core-Periphery Structure from Local Node Dominance in Social Networks](#). European Signal Processing Conference (EUSIPCO). 2015
- [10] Adam Wilkerson, **Harish Chintakunta**, and Hamid Krim. [Computing persistent features in big data: A distributed dimension reduction approach](#). International Conference on Acoustics, Speech, and Signal Processing (ICASSP). 2014
- [11] Saba Emrani, **Harish Chintakunta**, and Hamid Krim. [Real Time Detection of Harmonic Structure: a Case for Topological Signal Analysis](#). International Conference on Acoustics, Speech, and Signal Processing (ICASSP). 2014
- [12] **Harish Chintakunta** and Hamid Krim. Distributed boundary tracking using Alpha and Delaunay-Cech shapes. Demonstrated at International conference on Discrete Geometry for Computer Imagery. 2013
- [13] Adam Wilerson, **Harish Chintakunta**, Hamid Krim, Terrence J. Moore, and Ananthram Swami. [A distributed collapse of a network's dimensionality](#). IEEE Global Conference on Signal and Information Processing (GlobalSIP). 2013
- [14] Jennifer Gamble, **Harish Chintakunta**, and Hamid Krim. [Applied topology in static and dynamic sensor networks](#). IEEE international conference on Signal Processing and Communications (SPCOM). 2012
- [15] **Harish Chintakunta** and Hamid Krim. [Detection and tracking of systematic time-evolving failures in sensor networks](#). IEEE international workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP). 2011
- [16] **Harish Chintakunta** and Hamid Krim. [Divide and conquer: Localizing coverage holes in sensor networks](#). IEEE Sensor Mesh and Ad Hoc Communications and Networks (SECON). 2010

## **TEACHING**

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### **Teaching Assistantship**

Duties included supervising labs, teaching classes, grading, tutoring and preparing home works and exams. 2006-2008

### **Fundamentals in Teaching (FIT) workshop series**

This is a series of workshops offered at NCSU to prepare students for life as a faculty. I have participated in workshops on topics including, 2011

- Motivational teaching strategies.
- Classroom management.
- Effective questioning techniques.

- Responding to student writing.
- Writing learning outcomes.

### **Mentored Teaching Assistantship (MTA)**

A competitive program sponsored by the graduate school, giving students the opportunity to teach classes under the guidance of a mentor. 2012

### **Guest Lectures**

Estimation and Detection, introductory sessions. Instructor: Dr. Hamid Krim 2012

Computational geometry, session on algebraic topology. Instructor: Dr. Edgar Lobaton 2013

Responsible for graduate level classes in “Pattern Recognition”. spring 2014

### **INVITED TALKS**

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Distributed localization of coverage holes using topological persistence. Special session on New Trends in Topology. 28<sup>th</sup> Summer Conference on Topology and its Applications. 2013

Tutorial on persistent homology and its applications. Mathematics department, North Carolina State University. 2013

Distributed computation of homology generators (poster). Workshop on Topological Data Analysis, Institute for Mathematics and its Applications (IMA). 2013

Distributed Topology using Harmonics. Workshop on Topological Data Analysis, 2013-2014 Program on Low-dimensional structure in High-dimensional Systems, SAMSI. 2014

Topology in networks: Algorithms for distributive aggregation of local data for global inference (poster). Workshop on Topological Systems: Communications, Sensing, and Actuation, Institute for Mathematics and its Applications (IMA). 2014

Beyond clustering: analysis of topological features using higher order combinatorial Laplacians (poster). Workshop on Topology and Geometry of Networks and Discrete Metric Spaces, Institute for Mathematics and its Applications (IMA). 2014

### **AWARDS AND HONORS**

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Nominated for the University outstanding Teaching Assistantship award. 2012

Served on the panel for international TA workshop, North Carolina State University. 2011-2012

Certificate of Merit for Winning Poster, Defense Threat Reduction Agency,  
Basic Research Program Technical Review.

2009

## **VOLUNTEERING AND OUTREACH**

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Officer of the Graduate Student Association (GSA), ECE, NCSU.

2012-2013

Organizing the Journal club, a graduate student lecture series.

since 2010

Volunteer for departmental open house. ECE, NCSU.

since 2009