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# GIRISH VARMA

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Male · Age: 32  
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## 1 Career Summary

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### EDUCATION

PhD in Computer Science 2011 - 2015  
[School of Computer and Systems Sciences, Tata Institute of Fundamental Research, Mumbai.](#)  
Thesis advised by [Prof. Prahladh Harsha](#) on “Hardness of Approximate Coloring”.

Masters in Computer Science 2008 - 2011  
[School of Computer and System Sciences, Tata Institute of Fundamental Research, Mumbai.](#)  
Thesis advised by [Prof. Manoj Gopalkrishnan](#) on “Uniform Sampling & Approximation using MCMC Methods”.

Bachelor of Technology in Computer Science and Engineering 2004 - 2008  
[National Institute of Technology, Calicut.](#)

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### EMPLOYMENT

Senior Project Scientist 2016 - Now  
[Machine Learning Lab, Kohli Center for Intelligent Systems, IIIT Hyderabad](#), Gachibowli.  
Worked with [Prof. C V Jawahar](#).

Postdoctoral Researcher 2015 - 2016  
[Faculty of Mathematics and Computer Science, Weizmann Institute of Science, ISRAEL.](#)  
Advised by [Prof. Irit Dinur](#).

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### FELLOWSHIPS & AWARDS

**JTCF Novel Technology paper award for Amusement Culture Finalist at IROS, 2018**

**Best Runner-Up Award for a paper at CVPR Embedded Vision Workshop, 2018**

Dean’s Postdoctoral Fellowship, Faculty of Math and Computer Science, 2015 - 2016  
**Weizmann Institute, ISRAEL**

Google India PhD Fellowship in Algorithms 2011 - 2015  
Microsoft PhD Fellowship, 2011 (Declined)

**Ranked 5th in the Kerala State Engineering Entrance Exam** 2004

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### INTERNSHIPS & VISITS

[Weizmann Institute of Science, ISRAEL](#) (3 months) 2014  
Worked with [Prof. Irit Dinur](#) on Graph Product Testing.

[Courant Institute, NYU](#) (1 week) 2014  
Worked with [Prof. Subhash Khot](#) on proving restricted versions of Unique Games Conjecture.

[MPI Institute for Informatik, Saarbrücken](#) (4 months) 2010  
Worked with [Prof. Kurt Melhorn](#) and [Prof. Vincenzo Bonifaci](#) on a mathematical model of a Slime Mold solving a maze.

**Google India** (3 months) 2007  
Development of a generic load testing platform for http based services. Used to test Google Map Maker servers.

## — JOURNAL —

[Super-polylogarithmic hypergraph coloring hardness via low-degree long codes](#). Venkat Guruswami, Prahladh Harsha, Johan Håstad, Srikanth Srinivasan & Girish Varma. *SIAM Journal on Computing (SICOMP)*, 2016.

[Physarum can compute shortest paths](#). Vincenzo Bonifaci, Kurt Mehlhorn, & Girish Varma. *Journal of Theoretical Biology (JTB)*.

[Streaming algorithms for some language recognition problems](#). Ajesh Babu, Nutan Limaye, Jaikumar Radhakrishnan & Girish Varma. *Theoretical Computer Science Journal (TCS)*. **Invited Paper**.

[Reducing uniformity in Khot-Saket hypergraph coloring hardness reductions](#). Girish Varma. *Chicago Journal of Theoretical Computer Science (CJTCS)*, 2015(3).

[A Characterization of hard-to-cover CSPs](#). Amey Bhangale, Prahladh Harsha & Girish Varma. *Theory of Computing Journal (ToC)*.

## — CONFERENCE —

[Super-polylogarithmic hypergraph coloring hardness via low-degree long codes](#). Venkat Guruswami, Prahladh Harsha, Johan Håstad, Srikanth Srinivasan & Girish Varma. *In Proc. 46th ACM Symp. on Theory of Computing (STOC'14)*.

[Physarum can compute shortest paths](#). Vincenzo Bonifaci, Kurt Mehlhorn, & Girish Varma. *Sym. on Discrete Algorithms (SODA'11)*.

[On Fortification of Projection Games](#). Amey Bhangale, Ramprasad Saptrishi, Rakesh Venkat & Girish Varma. *Randomized Algorithms (RANDOM'15)*.

[A Characterization of hard-to-cover CSPs](#). Amey Bhangale, Prahladh Harsha & Girish Varma. *Computational Complexity Conference (CCC'15)*.

[Derandomized graph product results using the low degree long code](#). Irit Dinur, Prahladh Harsha, Srikanth Srinivasan & Girish Varma. *Symp. on Theoretical Aspects of Computer Science (STACS'15)*.

[Streaming algorithms for some language recognition problems](#). Ajesh Babu, Nutan Limaye, Jaikumar Radhakrishnan & Girish Varma. *Theory and Applications of Models of Computation (TAMC'10)*.

## — THESIS —

[Hardness of Approximate Coloring](#). Girish Varma. *Ph.D. Thesis with guidance of Prof. Prahladh Harsha, TIFR, Mumbai*.

[Approximate Counting, Uniform Generation and Rapidly Mixing Markov Chains](#). Girish Varma. *MS. Project Report with guidance of Dr. Manoj Gopalkrishnan, TIFR, Mumbai*.

[Deep Expander Networks: Efficient Deep Networks from Graph Theory](#). Girish Varma\*, Ameya Prabhu\*, & Anoop Naboothiri. *European Conference on Computer Vision (ECCV'18)*, 2018. **Oral Presentation** (4% acc. rate).

[Improved Visual Relocalization by Discovering Anchor Points](#). Soham Saha, Girish Varma & C V Jawahar. *British Machine Vision Conference (BMVC'18)*, 2018. **Spotlight Presentation** (10% acc. rate).

[Cityscale Road Audit System using Deep Learning](#). Sudhir Kumar, Girish Varma & C V Jawahar. *International Conference on Intelligent Robots (IROS'18)*, 2018. **JTCF Novel Technology paper award for Amusement Culture Finalist**. Was featured in local print media The Hindu, Times of India etc.

[IDD: A Dataset for Exploring Problems of Autonomous Navigation in Unconstrained Environments..](#) Girish Varma, Anbumani Subramanian, Anoop Namboodiri, Manmohan Chandraker, C V Jawahar. *IEEE Winter Conf. on Applications of Computer Vision (WACV'19)*.

[Efficient Semantic Segmentation using Gradual Grouping](#). Nikitha Varullapalli, Sriharsha Annameni, Girish Varma, Manu Mathew, Nagori Soyeab & C V Jawahar. *CVPR, IEEE Embedded Vision Workshop*, 2018. **Best Runner-Up Award, Oral Presentation**.

[Class2Str: End to End Latent Hierarchy Learning](#). Girish Varma\*, Soham Saha\* & C V Jawahar. *24th International Conference on Pattern Recognition (ICPR'18)*, 2018.

[Compressing Deep Neural Networks for Recognizing Places](#). Soham Saha, Girish Varma, & C V Jawahar. *Asian Conference on Pattern Recognition (ACPR'18)*, 2018. **Spotlight Presentation**.

— UNDER REVIEW/ONGOING —

Universal Semi-supervised Semantic Segmentation. Tarun Kalluri, Girish Varma, Manmohan Chandraker & C V Jawahar. Under review.

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## INDUSTRY PROJECTS

**Intel Bangalore.** Data Sets for Autonomous Navigation Research in Indian Traffic Conditions · PI's: [Prof. C V Jawahar](#), [Prof. Anoop M. Namboodiri](#) · Involved creating a semantic segmentation/detection dataset for Indian road scenes. I authored the dataset specifications containing label hierarchy and definitions. A statistical analysis of the labels was done and the train/test/validations sets were decided. A challenge was conducted as ECCV'18 with participants from industry/academia from across the globe. A dataset paper with comparisons with other similar datasets was prepared.

**Texas Instruments Bangalore.** Model Compression for Semantic Segmentation · PI: [Prof. C V Jawahar](#) · Conducted 2 workshops of 1 day each on semantic segmentation and model compression for researchers from TI. A report of runtime and memory analysis of semantic segmentation models was shared with TI. Based on the report, we focused on designing efficient CNNs for semantic segmentation. A research paper was published at CVPR IEEE Embedded Vision Workshop (won the Best Runners Up Award).

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## REVIEWING, WORKSHOPS, CHALLENGES, RESEARCH EVENTS ORGANIZED

**Member of PC for** [AMAS'19](#), [AAAI'19](#), [IJCAI'18](#), [Auto. Nav. in Unconstrained Environments Workshop](#), [ECCV '18](#).

[Scene Understanding Challenge for AutoNUE, ECCV'18](#).

[Tutorial on Computer Vision for Autonomous Navigation at NCVPRIPG '17.](#)

[Aurickshaw Detection Challenge at NCVPRIPG '17.](#)

### 3 Teaching

#### COURSES

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##### [Foundations of AI and ML](#)

Jan, 2018

5 Lectures out of a 15 lecture course co-taught with Prof. C V Jawahar and Prof. Anoop Namboothiri · 400 participants with 5-15 years experience in Industry · Prepared reading material.

##### [Complexity Theory](#)

Jan, 2017

13 Lectures · 110 Students · Course Notes and Assignments Available Online

A Student got selected for VSRP (fully supported internship program) at TIFR, Mumbai in Complexity Theory

#### READING GROUPS/INDEPENDENT STUDY

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##### **Reinforcement Learning**

July 2018

2 Students

##### [Efficient CNNs](#)

Jan 2018

6 Students · Participants published 2 papers on Efficient CNNs

##### **Matrix Sparsification Techniques for Model Compression**

July 2017

1 Student · Resulted in a publication on using Expander Graphs for Model compression

##### [Multi-Object Tracking](#)

Jan 2018

4 Students

##### **Computer Vision: Recent Developments**

Jan 2017

#### SHORT TERM COURSES AND SCHOOLS

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##### [Summer School on Machine Learning and Computer Vision](#)

July 2018

2 weeks School · 250 participants mostly PhD students, but also some industry and faculty · Gave 2 Talks and labs

##### **Deep Learning and Applications**

April 2018

AICTE funded training program at CET, Trivandrum · Gave 4 Lectures and 2 Labs in a 1 Week Program ·

##### [Summer School on Machine Learning and Computer Vision](#)

July 2017

2 weeks School · 250 participants mostly PhD students, but also some industry and faculty · Gave 6 Talks

##### **Winter School on Deep Learning**

Dec 2016

1 week school mostly aimed at industry participants · Gave 3 talks

##### **Training programs for Industry Leadership in Microsoft, Amazon**

#### GUIDING

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**Soham Saha** · MS student co-advised with Prof. C V Jawahar · Currently Data Scientist at Flipkart · Published 3 papers including one that got selected for Spotlight presentation at BMVC'18.

**Ameya Prabhu** · MS student co-advised with Prof. Anoop Namboodiri · Published 1 paper at ECCV'18 that was selected for oral presentation.

**Sudhir Yarram** · Intern co-advised with Prof. C V Jawahar · Accepted for PhD program at UIUC · Published 1 paper at IROS'18 that got selected as JTCF Novel Technology paper award finalist.

**Nikitha Vallurpalli** · MS student co-advised with Prof. C V Jawahar · Published 1 paper at Embedded Vision Workshop CVPR'18 that got selected for Best Runners Up Award.