

# Dr. Srikant Srinivasan

2031 Roy J. Carver Co-Lab  
Iowa State University,  
Ames, IA – 50014, USA.

Email: srikants@iastate.edu  
srikant.srinivasan81@gmail.com  
Phone (m) 1-5154510823

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## Professional Appointments

Adjunct Assistant Professor/ Data Scientist 10/2014 - present  
Plant Sciences Institute, Iowa State University  
Specialization: High throughput phenotyping data acquisition and big data analytics

Post-Doctoral Research Associate 09/2012 – 10/2014  
Materials Science & Engineering, Iowa State University  
Specialization: Materials informatics and modeling, machine learning, statistical analysis

Post-Doctoral Research Associate 06/2012 – 08/2012  
Electrical and Computer Engineering, Purdue University  
Specialization: Transport mechanisms in electronic

## Education

Ph.D., Advisor: Prof. Supriyo Datta 08/2005 – 05/2012  
Electrical and Computer Engineering, Purdue University

M.S., Advisor: Prof. Harold W. Carter, 08/2003 – 06/2005  
Electrical and Computer Engineering, University of Cincinnati

B.Tech., Electronics and Communication Engineering, 10/1999 – 05/2003  
Jawaharlal Nehru Technological University, Hyderabad, India

## Awards

- Recipient of the “*Outstanding Dissertation in Magnetism*” award from the American Physical Society Topical group on Magnetism (APS-GMAG) for the year 2012.
- Recipient of “*Student Innovator Award*” from Purdue University, 2012.
- *Best Poster Award*, Nanoelectronics Research Initiative (NRI) onsite review at Albany, NY, 2011.

## Patents

- B. Behin-Aein, **S. Srinivasan**, A. Sarkar, S. Datta and S. Salahuddin, (2012). *Proposal for an All-Spin Transistor with Built-in Memory*. Patent # US 8558571 B2
- “A solar powered network array of cameras with programmable control for high throughput field phenotyping” – to be submitted to ISURF

## Publications Summary

Type/No of publications	Published	Under review
In International Journals	12	2
In International Conferences	9	2
Book chapters	1	0

## Research Experience

- *Big Data Analytics*: Expertise in data mining, statistical/ regression analysis techniques, machine learning, linear and non-linear dimensionality reduction.
- *Sensor Networks*: Successfully implemented networked array of more than 100 raspberry pi microcomputers each controlling 4 cameras. Collected imaging data with UAV and ground based robotic platforms. Expertise in issues involved with high throughput data collection, curation, quality control and analysis. Expertise in digital image processing with MATLAB.
- *Nanoelectronic device physics and design*: Design and analysis of novel device alternatives to highly scaled CMOS. Dealt with spintronics, and graphene based devices.
- *Modeling*: Expertise in theory, modeling and analysis of non-equilibrium transport using quantum mechanical (NEGF) as well as standard semi-classical techniques; Expertise in atomistic simulation and analysis of band-structure physics; Exposure to circuit design.
- *Experimental*: Have actively assembled equipment related to sensors and associated machinery. Have been trained and participated in processes of device fabrication, characterization, machine shop work.
- *Managerial and Team skills*: Actively coordinated inter-university collaborations and wrote joint proposals for funded research. Provided leadership to a team of several students and post-doctoral researchers from varied experiment, theory and multidisciplinary backgrounds.

## Students being Co-Mentored

- Thesis committee member for:
  - Anirudh S. Iyengar (PhD student, University of South Florida)
  - Rekha Govindaraj (PhD student, University of South Florida)
  - Ting Zhang (MS student, China Agricultural University, defended successfully, 2016)
  - Huimin Chen (MS student, China Agricultural University, defended successfully, 2016)
- Undergraduate Students mentored (Iowa State University):

Katherine Lenson	Daniel Geiselhart
Wan Zulsarhan Wan Shaari	Simrita Varma

## Sponsored research:

- Co-PI, “Big Data for Big Demands: Sustaining the crop market in the US and enabling sustainable crop management practices by accurate crop yield forecasting using machine learning”, Presidential Initiative for Interdisciplinary Research, Iowa State University: \$600,000 (Dec. 2015 – Dec. 2017).

## Other Professional Activities

- Program Committee Member, ACM-SIGKDD 2016
- Guest series editor for the journal Gigascience
- Reviewer for
  - IEEE Journal on Emerging and Selected Topics in Circuits and Systems
  - Computational Materials Science (Elsevier)
  - Materials (MDPI)

## Publication Details

### Book Chapter

- [B1] **S. Srinivasan**, V. Diep, B. Behin-Aein, A. Sarkar and S. Datta, “Modeling Multi-magnet networks interacting via Spin Currents,” in *Handbook of Spintronics*, eds: D. Awschalom, J. Nitta and Y. Xu, Springer (2015).

**Journals** (Journal impact factor represented by [JIF])

- [J1] **S. Srinivasan**, S. R. Broderick, R. Zhang, A. Mishra, S. B. Sinnott, S. K. Saxena, and K. Rajan, "Mapping chemical selection pathways for designing multicomponent alloys: an informatics framework for materials design", *Sci. Rep.*, 5, 17960, doi:10.1038/srep17960 (2015). [JIF: 5.1]
- [J2] **S. Srinivasan**, K. Kaluskar, S. Dumpala, S. Broderick, and K. Rajan, "Automated voxelization of 3D atom probe data through kernel density estimation", *Ultramicroscopy*, 159, 2, 381-386, doi:10.1016/j.ultramic.2015.03.012 (2015). [JIF: 2.74]
- [J3] **S. Srinivasan**, K. Kaluskar, S. Broderick, and K. Rajan, "Extracting features buried within high density atom probe point cloud data through simplicial homology", *Ultramicroscopy*, 159, 2, 374-380, doi:10.1016/j.ultramic.2015.04.009 (2015). [JIF: 2.74]
- [J4] Raju, S. V., A. A. Oni, B. K. Godwal, J. Yan, V. Drozd, **S. Srinivasan**, J. M. LeBeau, K. Rajan and S. K. Saxena (2015). "Effect of B and Cr on elastic strength and crystal structure of Ni<sub>3</sub>Al alloys under high pressure." *Journal of Alloys and Compounds* 619(0): 616-620 (2015). [JIF: 2.72]
- [J5] S. Broderick, U. Ray, **S. Srinivasan**, K. Rajan, and G. Balasubramanian, "An informatics based analysis of the impact of isotope substitution on phonon modes in graphene," *Appl. Phys. Lett.*, 104, 243110 (2014). [JIF: 3.52]
- [J6] **S. Srinivasan** and K. Rajan, "Revisiting Computational Thermodynamics through Machine Learning of High Dimensional Data," *IEEE Computing in Science & Engineering*, vol. 15, no. 5, pp. 22-31 (2013). [JIF:2.47]
- [J7] **S. Srinivasan** and K. Rajan, "Property Phase Diagrams for compound semiconductors through data mining," *Materials*, 6(1), 279-290 (2013). [JIF: 1.3]
- [J8] A. Zainuddin, S. Hong, L. Siddiqui, **S. Srinivasan**, and S. Datta, "Voltage controlled spin precession," *Phys. Rev. B*, 84, 165306 (2011). [JIF: 3.66]
- [J9] **S. Srinivasan**, A. Sarkar, B. Behin-Aein, and S. Datta, "All Spin Logic Device with Inbuilt Non-reciprocity," *IEEE Trans. Magn.*, 47, 10 (2011). [JIF: 1.2]
- [J10] B. Behin-Aein, A. Sarkar, **S. Srinivasan**, and S. Datta, "Switching Energy-Delay of All-Spin Logic devices," *Appl. Phys. Lett.*, 98, 123510 (2011). [JIF: 3.52]
- [J11] A. Zainuddin, H. Kum, D. Basu, **S. Srinivasan**, L. Siddiqui, P. Bhattacharya, and S. Datta, "Magnetoresistance of lateral semiconductor spin valves," *J. App. Phys.*, 108, 123913 (2010). [JIF: 2.1]
- [J12] **S. Srinivasan**, L. Rokhinson, and G. Klimeck, "Valley Splitting in Si Quantum Dots embedded in SiGe," *Appl. Phys. Lett.*, 93, 112102 (2008). [JIF: 3.52]

**Under review**

- A. Iyengar et al., "Retention Testing Methodology for STTRAM", IEEE Design & Test, 2016.
- E. Lee et al., "Genomes to Fields' Maize GxE Project: Expression of Productivity and Phenological Traits Across a Diverse Set of Environments", Crop Science, 2016.

**Papers published in International conference proceedings**

- [C1] A. A. Oni, X. Sang, A. Kumar, S. V. Raju, **S. Srinivasan**, S. Sinnott, S. Saxena, K. Rajan and J. M. LeBeau. Direct Lattice Parameter Measurements Using HAADF-STEM. *Microscopy and Microanalysis*, 20 (Suppl. 3), pp 1050-1051 (2014).
- [C2] A. Sarkar, **S. Srinivasan**, B. Behin-Aein and S. Datta, "Information Processing with spins and magnets," *SRC Techcon* (2012).
- [C3] A. Sarkar, B. Behin-Aein, **S. Srinivasan** and S. Datta, "All Spin Logic device as a compact neuron," *Proc. IEEE Device Research Conference* (2012).

- [C4] **S. Srinivasan**, A. Sarkar, B. Behin-Aein and S. Datta, "All Spin Logic: Computing with spins and magnets," *IEEE Intermag* (2012) - *Invited*.
- [C5] C. Augustine, G. Panagapoulos, B. Behin-Aein, **S. Srinivasan**, A. Sarkar, and K. Roy, "Low power functionality enhanced computation architecture using spin-based devices," *IEEE International symposium on Nanoscale Architecture* (2011).
- [C6] C. Augustine, A. Raychowdhury, B. Behin-Aein, **S. Srinivasan**, J. Tschanz, V. De, and K. Roy, "Numerical Analysis of Domain-Wall propagation for dense memory arrays," *IEEE International Electron Devices Meeting* (2011).
- [C7] A. Sarkar, **S. Srinivasan**, B. Behin-Aein and S. Datta, "All Spin Logic" *IEEE International Electron Devices Meeting* (2011).
- [C8] **S. Srinivasan**, A. Sarkar, B. Behin-Aein, and S. Datta, "All Spin Logic: from devices to circuits," *SRC Techcon* (2011).
- [C9] **S. Srinivasan**, A. Sarkar, B. Behin-Aein and S. Datta, "Unidirectional Information transfer with cascaded All Spin Logic devices: A Ring Oscillator," *IEEE Device Research Conference* (2011).

#### **Under review**

- R. Govindaraj, J. Jang, S. Ghosh, N. Rathi, **S. Srinivasan**, K. Ahmed, C. Augustine, S. Mukhopadhyay, "A Novel Energy Harvesting Methodology using STTRAM", ISLPED, 2016
- K. Kaluskar, **S. Srinivasan**, S. Broderick, and K. Rajan, "Uncertainty quantification and visualization in Atom Probe Tomography", APTM/IFES, 2016

#### **Abstracts published in conferences**

- [A1] **S. Srinivasan**, S. Broderick, and K. Rajan, "Graph Theory for Mapping Pathways for Alloy Design," *Mat. Res. Soc. Fall meeting* (2014).
- [A2] A. Mishra, S. Broderick, **S. Srinivasan**, K. Kim and K. Rajan, "Scintillator Discovery via Materials "Omics"," *Mat. Res. Soc. Fall meeting* (2014).
- [A3] G. R. Santhanam, P. Dubey, **S. Srinivasan**, S. Broderick and K. Rajan, "A Decision Theoretic framework for materials selections in the presence of uncertainty," *Mat. Res. Soc. Fall meeting* (2014).
- [A4] **S. Srinivasan**, A. Sarkar, B. Behin-Aein and S. Datta, "All Spin Logic: Computing with spins and magnets," *IEEE Intermag* (2012) - *Invited*.

#### **Invited Talks**

- Material's Week 2013, Inst. for Mat. Res., Ohio State University, Cleveland, OH. "*High Dimensional Data Modeling for Materials Design*," May, 2013.
- American Physical Society's March meeting, Boston, MA. "*All Spin Logic: Multi-magnet networks interacting via spin currents*," March, 2012.
- Intel Inc. - Components Research Division, Hillsboro, OR. "*Modeling Multi-magnet networks interacting via spin currents*," Dec., 2011.