

# Sirisha Rambhatla

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CONTACT INFORMATION	441 Walter Library, 117 Pleasant St. SE, Minneapolis, MN 55455	E-mail: <a href="mailto:rambhoo2@umn.edu">rambhoo2@umn.edu</a> Homepage: <a href="http://www.sirisharambhatla.com">www.sirisharambhatla.com</a> LinkedIn: <a href="http://www.linkedin.com/in/sirisharambhatla/">www.linkedin.com/in/sirisharambhatla/</a>	Phone: 215 – 873 – 4767
PROFESSIONAL SUMMARY	Analytical and detail oriented electrical engineer working at the cusp of machine learning, statistical signal processing, and optimization. Passionate about developing scalable algorithms with theoretical performance guarantees to extract patterns from data in order to solve high-impact real-world problems. Adept at analyzing and developing models and algorithms for various learning tasks, and at prototyping them.		
EDUCATION	<b>Doctor of Philosophy (Ph.D.)</b> in Electrical Engineering Aug. 2014 - May 2019 ( <i>Expected</i> ) University of Minnesota–Twin Cities (3.8) Advisor: Prof. Jarvis Haupt Thesis Topic: Provable Algorithms for Matrix Decompositions & Factorization  <b>Master of Science (M.S.)</b> in Electrical Engineering Aug. 2010 - Dec. 2012 University of Minnesota–Twin Cities (3.7) Thesis: Semi-Blind Source Separation via Sparse Approximation & Online Dictionary Learning  <b>Bachelor of Technology (B.Tech)</b> in Electronics & Telecom. Engineering Aug. 2006 - May 2010 College of Engineering Roorkee (COER), India (81.4% (Honors)) ( <i>Bronze Medalist</i> )		
SKILLS	Scientific Computing: MATLAB/Simulink (expert), Mathematica (intermediate) Programming Languages: Python (intermediate)(SciPy, scikit-learn, Natural Language Toolkit (NLTK), pandas), C (intermediate), C++ (intermediate) Deep Learning Tools: TensorFlow (beginner), PyTorch(beginner) Other skills: Proficient with Linux/Unix Shell. Embedded systems programming. Leveraging Supercomputing resources. Exceptional written and verbal communication skills.		
EXPERIENCE	<b>Graduate Research Assistant</b> Feb. 2011 – May 2012 & Aug. 2014 – Present Dept. of Electrical and Computer Engineering University of Minnesota–Twin Cities, Minneapolis, MN <ul style="list-style-type: none"><li>Analyzed 5 matrix/tensor factorization and demixing models for machine learning applications and pose them as semi-supervised and unsupervised learning tasks. Developed provable algorithms for these learning tasks using convex and non-convex formulations. Designed and implemented experiments to analyze the performance of these algorithms using high performance computing tools. Analyzed the algorithms theoretically using tools from statistical signal processing and optimization.</li><li>Identified applications (and analyzed performance) of the developed techniques on real-world applications. For instance, developed a technique for localizing targets based on their spectral signatures in hyperspectral images.</li><li>Developed a fast, scalable, distributed algorithm with performance guarantees for recovering the factors of the dictionary learning model. Designed and implemented the algorithm as a neural network to be run on graphical processing unit (GPU)s via TensorFlow.</li><li>Developed an algorithm for tensor factorization based on the dictionary learning technique.</li><li>Developed a technique to build topological maps from Lidar data using tensor decompositions.</li><li>Mentored our research group on utilizing the supercomputing resources at the university in order to to significantly speed-up various computational tasks in the group.</li></ul>		

**Science Advisor**

Intellectual Property (IP) and Technology Litigation

Mar. 2013 – Jun. 2014

Robins Kaplan LLP, Minneapolis, MN

- Strategized for various technical issues involved in technology licensing and IP litigation. Analyzed potential IP cases to evaluate their validity and scope. Performed infringement analysis, including source code inspection (Android, iOS, JAVA, C++, C and Objective-C code).
- Designed experiments to identify infringement. In a particular instance, developed an experiment on-the-fly in a client facing meeting to save upwards of \$100,000 in chip tear-down costs (and time) to prove infringement.

**Engineering Intern (R&D)**

Technology and Engineering Division

Jun.– Aug. 2011 &amp; Jun.– Oct. 2012

Ativa Medical Inc., St. Paul, MN

- Developed signal & data analysis algorithms for instrumentation of flow-cytometry-based product.
- Collaborated with the team to develop an imaging based blood diagnostics product. Designed a wavelet based focus-stacking algorithm to improve quality of images to enable identification of blood cells.

**Undergraduate Research Intern**

Networked Control Systems Lab

May 2009 – Jul. 2009

Indian Institute of Technology Kanpur (IITK), Kanpur, India

- Developed a networked embedded test-bed for an all-wheel drive and steer prototype lunar rover.
- Designed, test and document the distributed control algorithms on the test-bed for control of D.C. motors to facilitate its use for an undergraduate course at the institute

SELECTED  
PUBLICATIONS

[1] **S. Rambhatla**, N. D. Sidiropoulos and J. Haupt. TENSORMAP: Lidar-based Topological Mapping and Localization via Tensor Decompositions, *IEEE Global Conference on Signal and Information Processing (GlobalSIP)*, 2018.

[2] **S. Rambhatla**, X. Li, and J. Haupt. Target Based Hyperspectral Demixing via Generalized Robust PCA. *Asilomar Conference on Signals, Systems, and Computers (Asilomar)*, 2017. **Student Best Paper Award Finalist**

[3] **S. Rambhatla**, X. Li, and J. Haupt. A Dictionary Based Generalization of Robust PCA. *IEEE Global Conference on Signal and Information Processing (GlobalSIP)*, 2016. **National Science Foundation (NSF) Travel Award**

[4] **S. Rambhatla** and J. Haupt. Semi-Blind Source Separation via Sparse Representations and Online Dictionary Learning. *Asilomar Conference on Signals, Systems, and Computers (Asilomar)*, 2013.

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TALKS

- “Provably Recovering Patterns from Data: Matrix to Tensors.” Nov. 2017  
— Yahoo! Research, San Jose, CA.
- “Dictionary based Generalization of Robust PCA.” Dec. 2016  
— GlobalSIP 2016, Washington D.C.

SELECTED  
AWARDS AND  
HONORS

E. Bruce Lee Memorial Fellowship, University of Minnesota–Twin Cities

Fall 2014 – Spring 2015

SciTechsperience Fellowship, Minnesota High Tech Association (MHTA)

Jul. 2012

Academic Excellence Award, COER, India

Sessions 2009 – 10 &amp; 2006 – 07

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COURSEWORK

Machine Learning, Probability and Stochastic Processes, Optimization Theory, Tensor Decompositions, Detection and Estimation, Collaborative and Social Computing, Nonlinear Optimization, Image Processing and Applications, Linear Systems and Optimal Control.

PROFESSIONAL  
MEMBERSHIPS

Collegiate Member, Society of Women Engineers (SWE), since 2018

Student Member, IEEE Signal Processing Society (SPS), since 2018

Student Member, IEEE, since 2013

Member, Eta Kappa Nu (HKN), since 2011