

# Jyotikrishna Dass

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## EDUCATION

**Texas A&M University**, College Station, TX August 2020 (expected)  
*PhD. candidate* in Computer Science and Engineering,  
Dissertation: *Distributed Training for Large-Scale Machine Learning Problems*  
Advisor: Prof. Rabi Mahapatra  
GPA: 3.80

**Indian Institute of Technology**, Guwahati, Assam May 2014  
*B.Tech* in Electronics and Communication Engineering  
Minors in Computer Science and Engineering  
GPA: 8.42/10

## RESEARCH INTERESTS

Machine Learning, Parallel and Distributed Computing, Hardware accelerators

## RESEARCH EXPERIENCE

**Texas A&M University** Aug 2014 - Present  
*PhD Candidate*  
Topic: Distributed Training for Large-Scale Machine Learning Problems

- Designed a relaxed synchronization approach for solving parallel quadratic programming problems
- Formulated analytic solution for optimal synchronization period ensuring guaranteed convergence, and numerical stability
- Devised a fast and memory-efficient framework to train large-scale Support Vector Machine problem in parallel
- Developed a communication-efficient model for scaling large-scale Support Vector Machine in a distributed computing setup
- Synthesized a multiple FPGA-based design for energy-efficient and distributed training of Support Vector Machine
- Working on a distributed framework for incremental learning in Kernel Ridge Regression
- Investigating distributed training of deep learning models on low-power and memory-constrained end devices

## TEACHING EXPERIENCE

**Department of CSE, TAMU** Aug 2018 - Dec 2018  
*Graduate Assistant Lecturer*  
CSCE 312: Computer Organization

- Appointed as instructor of record for a class of 35 undergraduate students from diverse engineering majors including international exchange students
- Taught an introductory course providing insights into fundamentals of organization and structure of computer systems
- Created lecture slides, assignments, projects, and exams, held weekly office hours to assist students in learning, and assigned grades at end of term
- Supervised a team of one teaching assistant and three peer teachers for effective learning and assistance during weekly lab projects
- Received student evaluation rating of 4.6/5, where, 5 denotes *Deserves an Award, Excellent*

**Department of CSE, TAMU**

Aug 2014 - Present

*Graduate Assistant Teaching*

Held multiple appointments with responsibilities that include teaching lab-related concepts, creating programming assignments and exams, helping around 1000 students with queries during lab and office hours, and maintaining a conducive and inclusive learning environment in labs with a team of 50+ peer teachers

- CSCE 111: Introduction to Computer Science and Programming (JAVA)  
By Dr. Joseph Hurley in Summer 2015, Spring 2016
- CSCE 121: Introduction to Program Design and Concepts (C++)  
By Dr. Michael Quinn in Spring 2017
- CSCE 206: Structured Programming in C++  
By Dr. Joseph Hurley in Fall 2014, Spring 2015, Summer 2015, Fall 2015, Summer 2016, Fall 2016
- CSCE 312: Computer Organization  
By Dr. Aakash Tyagi in Summer 2016, Fall 2017, Spring 2018, Spring 2019, Fall 2019

**PROFESSIONAL EXPERIENCE** **Transaction Risk Management Systems, Amazon, Seattle, WA***Applied Scientist Intern*

Jun 2017 - Aug 2017

Topic: Customer Behavioral Data and Modeling

- Applied machine learning methods to mouse tracking data to evaluate customer risk and identify account compromise
- Developed script to collect and structure real data set with millions of samples
- Programmed using R code for parsing and feature extraction from time series data and Python code for machine learning

**Multimedia, Graphics and Robotics Group, Innovation Labs, TCS, Gurugram, India***Research Intern*

May 2013 - Jul 2013

Topic: Automatic Hairstyle Discovery and Recognition

- Developed a novel method for automatic discovery and recognition of hairstyles in a collection of images
- Used OpenCV library for image processing and machine learning
- Improved accuracy of TCS fashion recommendation system from 40% to 76%

**PUBLICATIONS**

- **J. Dass**, Y Narawane, R. N. Mahapatra and V. Sarin, "FPGA-based Distributed Edge Training of SVM," in Proceedings of the 2019 ACM/SIGDA 27<sup>th</sup> International Symposium on Field Programmable Gate Arrays (**FPGA**), Seaside, CA. doi: <http://doi.acm.org/10.1145/3289602.3293954>
- **J. Dass**, V. Sarin and R. N. Mahapatra, "Fast and Communication-Efficient Algorithm for Distributed Support Vector Machine Training," in IEEE Transactions on Parallel and Distributed Systems (**TPDS**). doi: 10.1109/TPDS.2018.2879950
- D. Dang, **J. Dass** and R. Mahapatra, "ConvLight: A Convolutional Accelerator with Memristor Integrated Photonic Computing," 2017 IEEE 24<sup>th</sup> International Conference on High Performance Computing (**HiPC**), Jaipur, 2017, pp. 114-123
- **J. Dass**, V. N. S. P. Sakuru, V. Sarin and R. N. Mahapatra, "Distributed QR Decomposition Framework for Training Support Vector Machines," 2017 IEEE 37<sup>th</sup> International Conference on Distributed Computing Systems (**ICDCS**), Atlanta, GA, 2017, pp. 753-763
- K. Lee, R. Bhattacharya, **J. Dass**, V. N. S. P. Sakuru and R. N. Mahapatra, "A Relaxed Synchronization Approach for Solving Parallel Quadratic Programming Problems with Guaranteed Convergence," 2016 IEEE International Parallel and Distributed Processing Symposium (**IPDPS**), Chicago, IL, 2016, pp. 182-191

- **J. Dass**, M. Sharma, E. Hassan and H. Ghosh, “A density based method for automatic hairstyle discovery and recognition,” 2013 Fourth National Conference on Computer Vision, Pattern Recognition, Image Processing and Graphics (**NCVPRIPG**), Jodhpur, 2013, pp. 1-4

**PATENTS** “System and Method for Identifying a Hairstyle of a Person” , *India 3955/MUM/2013* (applied)

**SKILLS** **Programming:** C, C++, MATLAB, R, Python, Java, HDL  
**Applications:** Vim, MPI, OpenCV,  $\text{\LaTeX}$   
**Operating Systems:** Linux, Mac OSX, Windows  
**Languages:** English (proficiency), Hindi (native), Oriya (familiar), Bengali (familiar), French (familiar)

- AWARDS and HONORS**
- Selected (one of the three PhD students from TAMU CSE) to attend Computing@SEC academic recruiting event at University of Alabama, Tuscaloosa, AL
  - ACM FPGA 2019 Travel Grant (\$950) (ACM Sponsored), Seaside, CA
  - Selected as Graduate Assistant Lecturer (\$500 Research Support), Dept. of CSE, TAMU
  - Teaching Assistant Excellence Award 2018 (\$500), Dept. of CSE, TAMU
  - IEEE ICDCS 2017 Travel Grant (\$1000), Dept. of CSE, TAMU
  - IEEE ICDCS 2017 Travel Grant (\$500) (NSF sponsored), Atlanta, GA
  - IEEE IPDPS 2016 Travel Grant (\$568) (NSF sponsored), Chicago, IL
  - IEEE NCVPRIPG 2013 Travel Grant (TCS sponsored), Jodhpur, India
  - All India Rank: 2076, IIT-JEE 2010 (top 0.41% of 500,000 candidates)
  - All India Rank: 1246, AIEEE 2010 (top 0.12% of 1 million candidates)
  - Gold Medal for Academic Excellence 2009, DPS Vasant Kunj, Delhi, India

- PRESENTATIONS**
- Poster presentation at Computing@SEC 2019, University of Alabama, Tuscaloosa, USA
  - Poster presentation at ACM FPGA 2019, Seaside, CA, USA
  - Oral paper presentation at IEEE ICDCS 2017, Atlanta, GA, USA
  - Poster presentation at IEEE IPDPS 2016 PhD forum, Chicago, IL, USA
  - Poster presentation at CSE-IAP 2017, TAMU, College Station, TX, USA
  - Oral presentation on summer internship at Amazon, Seattle, WA, USA

- SERVICES**
- Reviewer
- ACM GLSVLSI 2016
  - NeurIPS 2016
- Leadership
- Vice President of Advocacy (2015), Student Adviser (2016)  
Indian Graduate Student Association, TAMU
- Miscellaneous
- IEEE Student Member
  - Volunteer, The Big Event, TAMU (2015 - 2016)
  - Judge, Student Research Week, TAMU (2015)

## MENTORSHIP

- V.N.S. Prithvi Sakuru (MS Thesis, 2016), now at Amazon Seattle
- Yashwardhan Narawane (MS Thesis, 2018), now at NVIDIA Santa Clara
- Mayuresh Hooli (MS Thesis, ongoing)
- Aurosmitta Khansama (MS Thesis, ongoing)
- Guiding four CSE undergraduate students with advice and applications for graduate school and research

## REFERENCES

Dr. Rabi Mahapatra  
Professor, Dept. of Computer Science & Engineering  
HRBB 520B, Texas A&M University, College Station  
rabi@tamu.edu, Phone:(979)845 – 5787

Dr. Aakash Tyagi  
Professor of Practice, Dept. of Computer Science & Engineering  
HRBB 515A, Texas A&M University, College Station  
tyagi@tamu.edu, Phone:(979)845 – 5480

Dr. Vivek Sarin  
Associate Professor, Dept. of Computer Science & Engineering  
HRBB 309C, Texas A&M University, College Station  
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Dr. Xia “Ben” Hu  
Assistant Professor, Dept. of Computer Science & Engineering  
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