Jyotikrishna Dass

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EDUCATION

Texas A&M University, College Station, TX — May 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

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^{th} 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^{th} 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^{th} 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, LaTeX
Operating Systems: Linux, Mac OSX, Windows
Languages: English (proficiency), Hindi (native), Oriya (familiar), Bengali (familiar), French (familiar)

AWARDS

- ACM FPGA 2019 Travel Grant, Seaside, CA
- Teaching Assistant Excellence Award 2018, Department of CSE, TAMU
- Travel Grant 2017, Department of CSE, TAMU
- IEEE ICDCS 2017 Travel Grant (NSF sponsored), Atlanta, GA
- IEEE IPDPS 2016 PhD Forum Travel Grant (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 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)

REFERENCES

Dr. Rabi Mahapatra
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Dr. Aakash Tyagi
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Dr. Vivek Sarin
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