

CONTACT INFORMATION	Dept. of Mathematics and Computer Science (IMADA) University of Southern Denmark Campusvej 55, Odense M - DK-5230	Office phone: +45 65 50 22 03 Email: ard@sdu.dk Webpage: www.aritradutta.com
CURRENT AFFILIATIONS	<ul style="list-style-type: none"> • Tenure-Track Assistant Professor, Department of Mathematics and Computer Sciences (IMADA); joint affiliation with Centre for AI Science and Applications, University of Southern Denmark (SDU), October 2021 to present. • Affiliated Researcher, Pioneer Centre for AI (P1), Denmark, May 2022 to present. 	
RESEARCHER IDS	Google Scholar Semantic Scholar DBLP ORCID	
ACADEMIC POSITIONS	June 2019 – September 2021	Postdoctoral Fellow , Extreme Computing Research Center, King Abdullah University of Science and Technology (KAUST), Host: Prof. Panos Kalnis.
	May 2017 – May 2019	Postdoctoral Fellow , Visual Computing Center, KAUST, Host: Prof. Peter Richtárik.
	Spring 2017, Summer 2022 Fall 2016	Adjunct , Department of Mathematics, UCF. Graduate Research Assistant , Center for Research in Computer Vision (CRCV), UCF.
	Fall 2010 – Fall 2016	Graduate Teaching Assistant and Associate , Department of Mathematics, UCF.
	January 2011 - July 2012	Graduate Research Assistant , GAUSS Project, UCF.
	June 2008 - August 2010	Assistant Professor of Mathematics , FIITJEE Limited, India.
EDUCATION	<ul style="list-style-type: none"> • Ph.D. in Mathematics, University of Central Florida (UCF), Fall 2016, GPA 3.579. Dissertation: Weighted Low Rank Approximation of Matrices: Some Analytical and Numerical Aspects. Ph.D. Advisor: Xin Li, Co-Advisor: Qiyu Sun. Dissertation Committee: M. Zuhair Nashed, Mubarak Shah, Ram N. Mohapatra. <i>Winner of Outstanding Dissertation Award, Department of Mathematics, UCF, 2016.</i> <i>Winner of Lee H. Armstrong award for excellence in Graduate teaching, UCF, 2017.</i> • M.S. in Mathematical Science, UCF, Fall 2011, GPA 3.528. • M.S. in Mathematics and Computing, Indian Institute of Technology (IIT), Dhanbad, 2008, GPA 7.22 (10 scale, First Class). Dissertation: Two Square and Two Cube Factorial Experiments. Advisor: Prof. G. N. Singh. • B.S. in Mathematics (Hons.), Minor in Physics and Statistics, Presidency College, Calcutta University, 2006. 	
RESEARCH INTERESTS	<p>Optimization and Machine Learning—Convex, nonconvex, and stochastic optimization, parallel and distributed computing, foundational aspects of deep learning.</p> <p>Signal Processing—Weighted and structured low-rank Matrix approximation, compressive sensing, applications in dimensionality reduction of big data, sparse representation.</p> <p>Image and Video Analysis—Object detection, tracking, action segmentation, background and foreground separation.</p> <p>Numerical Linear Algebra</p>	

¹Indian citizen, USA permanent resident

LIST OF
PUBLICATIONS

The papers are listed in reverse chronological order in terms of their appearance online. Coauthors marked with * denotes graduate or undergraduate student as the first or second author.

18. *On the Convergence Analysis of Asynchronous SGD for Solving Consistent Linear Systems*, ATAL N. SAHU*, ARITRA DUTTA, AASHUTOSH TIWARI, AND PETER RICHTÁRIK, *Linear Algebra and its Applications—Elsevier*, to appear, 2022. **(Impact Factor 1.401)**
17. *Direct Non-linear Acceleration*, ARITRA DUTTA, EL HOUCINE BERGOU, YUNMING XIAO, MARCO CANINI, AND PETER RICHTÁRIK, *Euro Journal on Continuous Optimization—Elsevier*, Vol. 10, pp. 100047, 2022. **(Impact Factor 1.452)**
16. *Rethinking Gradient Sparsification as Total Error Minimization*, ATAL N. SAHU*, ARITRA DUTTA, AHMED M. ABDELMONIEM, TRAMBAK BANERJEE, MARCO CANINI, AND PANOS KALNIS, in *Thirty-fifth Conference on Neural Information Processing Systems (NeurIPS 2021)*, 2021. **(Designated for Spotlight—less than 3% out of 9,122 submissions)**
15. *DeepReduce: A Sparse-tensor Communication Framework for Federated Deep Learning*, HANG XU*, KELLY KOSTOPOULOU*, ARITRA DUTTA, XIN LI, ALEXANDROS NTOULAS, AND PANOS KALNIS, in *Thirty-fifth Conference on Neural Information Processing Systems (NeurIPS 2021)*, 2021. (26% acceptance rate out of 9,122 submissions)
14. *GRACE: A Compressed Communication Framework for Distributed Machine Learning*, HANG XU*, CHEN-YU HO*, AHMED M. ABDELMONIEM, ARITRA DUTTA, EL HOUCINE BERGOU, KONSTANTINOS KARATSENIDIS, MARCO CANINI, AND PANOS KALNIS, *41st IEEE International Conference on Distributed Computing Systems (ICDCS)*, pp. 561-572, 2021. (19.8% acceptance rate)
13. *Huffman Coding Based Encoding Techniques for Fast Distributed Deep Learning*, RISHIKESH R. GAJJALA*, SHASHWAT BANCHHOR*, AHMED M. ABDELMONIEM, ARITRA DUTTA, MARCO CANINI, AND PANOS KALNIS, *Proceedings of the ACM 16th International Conference on Emerging Networking EXperiments and Technologies (CoNEXT) DistributedML workshop*, pp. 21–27, 2020.
12. *Best Pair Formulation & Accelerated Scheme for Non-convex Principal Component Pursuit*, ARITRA DUTTA, FILIP HANZELY*, JINGWEI LIANG, AND PETER RICHTÁRIK, *IEEE Transactions on Signal Processing*, Vol. 68, pp. 6128-6141, 2020. **(Impact Factor 6.08)**
11. *On the Discrepancy between the Theoretical Analysis and Practical Implementations of Compressed Communication for Distributed Deep Learning*, ARITRA DUTTA, EL HOUCINE BERGOU, AHMED M. ABDELMONIEM, CHEN-YU HO, ATAL NARAYAN SAHU, MARCO CANINI, AND PANOS KALNIS, in *Thirty-Fourth AAAI Conference on Artificial Intelligence (AAAI-20)*, 34 (4), pp. 3817-3824, April 2020. (20.6% acceptance rate out of 8,800 submissions; [Media coverage](#))
10. *A Nonconvex Projection Method for Robust PCA*, ARITRA DUTTA, FILIP HANZELY, AND PETER RICHTÁRIK, in *Thirty-Third AAAI Conference on Artificial Intelligence (AAAI-19)*, 33 (01), pp. 1468-1476, 2019. **(Designated for oral presentation—less than 8.4% out of 7,700 submissions)**
9. *Online and Batch Supervised Background Estimation via L1 Regression*, ARITRA DUTTA AND PETER RICHTÁRIK, *WACV 2019—IEEE Winter Conference on the Applications of Computer Vision*, pp. 541–550, 2019. (~ 34% acceptance rate)
8. *A Fast Weighted SVT Algorithm*, ARITRA DUTTA AND XIN LI, *5th International Conference on Systems and Informatics (ICSAI)*, pp.1022–1026, *IEEE Xplore*, 2018.
7. *Weighted Low Rank Approximation for Background Estimation Problems*, ARITRA DUTTA AND XIN LI, In proceedings of *IEEE International Conference on Computer Vision Workshops (ICCVW)*, pp. 1853–1861, 2017.
6. *A Batch-Incremental Video Background Estimation Model using Weighted Low-Rank Approximation of Matrices*, ARITRA DUTTA, XIN LI, AND PETER RICHTÁRIK, In proceedings of *IEEE International Conference on Computer Vision Workshops (ICCVW)*, pp. 1835–1843, 2017.

5. *Fast Detection of Compressively-Sensed IR Targets Using Stochastically Trained Least Squares and Compressed Quadratic Correlation Filter*, BRIAN MILLIKAN, [ARITRA DUTTA](#), QIYU SUN, AND HASSAN FOROOSH, IEEE Transactions on Aerospace and Electronic Systems, Vol. 53, Issue 5, pp. 2449–2461, 2017. (**Impact Factor 4.102**)
4. *A Fast Algorithm for a Special Weighted Low Rank Approximation*, [ARITRA DUTTA](#) AND XIN LI, 15th IAPR International Conference on Machine Vision Applications (MVA), pp. 93-96, IEEE Xplore, 2017.
3. *Shrinkage Function and Its Applications in Matrix Approximations*, TOBY BOAS, [ARITRA DUTTA](#), XIN LI, KATIE MERCIER, AND ERIC NIDERMAN, Electronic Journal of Linear Algebra, Vol. 32, pp. 163–171, 2017.
2. *On a Problem of Weighted Low Rank Approximation of Matrices*, [ARITRA DUTTA](#) AND XIN LI, SIAM Journal on Matrix Analysis and Applications, Vol. 38, No. 2, pp. 530–553, 2017. (**Impact Factor 1.944**)
1. *Initialized Iterative Reweighted Least Squares for Automatic Target Recognition*, BRIAN MILLIKAN, [ARITRA DUTTA](#), NAZANIN RAHNAVARD, QIYU SUN, AND HASSAN FOROOSH, In proceedings of IEEE Military Communications Conference, pp. 506-510, 2015.

TECHNICAL
REPORTS

4. *On a Weighted Singular Value Thresholding Algorithm*, [ARITRA DUTTA](#), BOQING GONG, XIN LI, AND MUBARAK SHAH, January 2019.
3. *Weighted Low-Rank Approximation for Background Modeling*, [ARITRA DUTTA](#), XIN LI, AND PETER RICHTÁRIK, April 2018.
2. *Image Compression Using Simulated Annealing*, [ARITRA DUTTA](#), GEONWOO KIM, MEIQIN LI, CARLOS ORTIZ MARRERO, MOHIT SINHA, COLE STIEGLERK, Mathematical Modeling in Industry XIX, Institute of Mathematics and its Applications, August 2015.
1. *Efficient and robust solution strategies for saddle-point systems*, JEREMY CHIU, LOLA DAVIDSON, [ARITRA DUTTA](#), JIA GOU, KAK CHOON LOY, MARK THOM, DIMITAR TRENEV, Mathematical Modeling in Industry XVIII, Institute of Mathematics and its Applications Preprint Series 2440, October 2014.

SELECTED LIST OF
OPEN-SOURCE
SOFTWARES

- [DeepReduce](#), 2021.
[ProGrAMMe](#), 2021.
[Huffman Coding Based Encoding Techniques for Fast Distributed Deep Learning](#), 2020.
[GRACE—GRADient ComprESSION for distributed deep learning](#), 2020.

SUBMITTED
JOURNAL
ARTICLE(S),
SELECTED
PREPRINTS, AND
WORKING ARTICLES

5. *Personalized Federated Learning with Communication Compression*, EL HOUCINE BERGOU, KONSTANTIN BURLACHENKO*, [ARITRA DUTTA](#), AND PETER RICHTÁRIK.
4. *An Adaptive Rank Continuation Algorithm for General Weighted Low-rank Recovery*, [ARITRA DUTTA](#), JINGWEI LIANG, AND XIN LI.
3. *Improving the Utility of Noise Injection in Private Split Learning*, HANG XU*, [ARITRA DUTTA](#), WEIRAN LIU, XIN LI, AND PANOS KALNIS.
2. *On the Nonconvex Convergence of SGD*, [ARITRA DUTTA](#), EL HOUCINE BERGOU, SOUMIA BOUCHEROUTIE, AND XIN LI.
1. *A Note on Randomized Kaczmarz Algorithm for Solving Doubly-Noisy Linear Systems*, SOUMIA BOUCHEROUTIE*, ANNA MA, XIN LI, EL HOUCINE BERGOU, [ARITRA DUTTA](#).

PH.D. THESIS

- [Weighted Low-Rank Approximation of Matrices: Some Analytical and Numerical Aspects](#), ARITRA DUTTA, Ph.D. Dissertation, Department of Mathematics, University of Central Florida.

MY RESEARCH
TEAM

My present research team comprises of 2 Ph.D. students, 3 Masters thesis students, 1 Bachelor thesis student, and 1 High school student. The students are listed in reverse chronological order in terms of their joining. Additionally, I have graduated 5 Masters thesis students; 4 of them in SDU and 1 while working at KAUST.

- **Ph.D. student**, MOSTAPHA ESSOULLAMI from Mohammed VI Polytechnic University (UM6P), October 2022 – Present (jointly supervising with Prof. El Houcine Bergou, UM6P).
- **Ph.D. student**, SOUMIA BOUCHEROUTIE from UM6P, May 2022 – Present (jointly supervising with Prof. El Houcine Bergou, UM6P).
- **Masters thesis student**, OSKAR LENLER ENKEGAARD and ANDREAS THRANE BRUUN from SDU Mathematics-Economics working on *Application of ML on Stock price prediction*, October 2022 – Present (jointly supervising with Dr. Aniruddha Dutta, University of California, Berkley).
- **Bachelors thesis student**, KIRSTEN HØJGAARD LANGE TIMM from SDU working on *Evaluating Handwritten OCR on Vaccination Cards*, September 2022 – Present (jointly supervising with Prof. Stefan Jänicke, SDU).
- **Masters thesis student**, JACOB NIELSEN from SDU working on *Object Detection and Tracking from a Drone Perspective*, January 2022 – Present (jointly supervising with Prof. Srijan Das, University of North Carolina at Charlotte).
- **Masters thesis student**, THOMAS WINTHER from SDU working on *Object Detection and Tracking from a Drone Perspective*, January 2022 – Present.
- **High school student**, COLE PLEPEL from Illinois Mathematics and Science Academy, February 2022 – Present.

STUDENTS
GRADUATED

- JAKOB FONNESBECH JOHNSEN, Masters thesis: *Automatic video detection of racket sports*, SDU (joint supervision with Prof. Stefan Jänicke, SDU), September 2022.
- HEINI BÆRENSTEN, Masters thesis: *Weakly-supervised action segmentation*, SDU, June 2022.
- SAMMY CHRISTENSEN and SIMON LINNERT FUGLEBÆK, joint Masters thesis: *Multi-view Fracture Detection*, SDU, June 2022. This project was in collaboration with the healthtech company RADIOBOTICS.
- CALLIOPE KOSTOPOULOU, Masters thesis: *Sparse Communication for Deep Learning* (joint supervision with Professor Alexandros Ntoulas from National and Kapodistrian University of Athens), June 2020. Calliope Kostopoulou is pursuing her graduate studies in computer science at Columbia University, NY, USA; Fall 2020.

UNDERGRADUATE
STUDENT SUPERVI-
SION/MENTORING

- MUHAMMED PATEL from Indian Institute of Technology, KGP, May 2020—August 2020. Mr. Patel worked on *Personalized Federated Learning* project.
- RISHIKESH R. GAJJALA and SHASHWAT BANCHHOR from Indian Institute of Technology, Delhi, December 2019—December 2020. This work resulted in a preprint: *Huffman Coding Based Encoding Techniques for Fast Distributed Deep Learning*. Rishikesh R. Gajjala is presently pursuing his graduate studies in computer science at Indian Institute of Science (IISc), Bangalore, India.
- YUNMING XIAO from Beijing University of Posts and Telecommunications, Beijing, China during July 2018—January 2019. This work resulted in a preprint: *Direct Nonlinear Acceleration*. Yunming Xiao is pursuing his graduate studies in computer science at Northwestern University, USA.
- ATAL NARAYAN SAHU and AASHUTOSH TIWARI from Indian Institute of Technology, Kanpur, in undergraduate research project at VCC, KAUST, May—July 2017. The collaboration continued until November 2019. This work resulted in a publication: *On the Convergence Analysis of Asynchronous SGD for Solving Consistent Linear Systems*, in *Linear Algebra and its Applications*, Elsevier. Atal Narayan Sahu is presently pursuing his graduate studies in computer science at KAUST since Spring 2019 and actively collaborating.

GRANTS

Contributor/Co-P.I. in grant application with Prof. El Houcine Bergou of UM6P as P.I. in hiring one PhD student for 4 years on project titled “On Kaczmarz Methods for Solving Large-scale Systems”; award date: August 2022. This position is partially supported by IMADA, SDU. Total amount: \$70,000 USD.

ACADEMIC AND
INDUSTRIAL
COLLABORATORS

I have collaborated with 7 Full Professors, 2 Associate Professors, and 7 Assistant Professors from 4 continents (America, Europe, Africa, and Asia), spread across different institutions worldwide.

- **Africa** — Mohammed VI Polytechnic University, Ben Guerir, Morocco.
- **Asia** — Alibaba Group; Biostatistics Group, KAUST, Saudi Arabia; InfoCloud Group, KAUST, Saudi Arabia; Indian Institute of Science (IISc), Bangalore; Indian Institute of Technology, Delhi; Indian Institute of Technology, Kanpur; Optimization and Machine Learning Lab, KAUST, Saudi Arabia; Shanghai Jiao Tong University, PRC.
- **Europe & UK** — Amazon Research, Berlin; Central European Institute of Technology, Czech Republic; Department of Applied Maths and Theoretical Physics (DAMTP), University of Cambridge, UK; IBM Research, Dublin; Institut national de la recherche agronomique (INRA), France; Institut national de recherche en informatique et en automatique (INRIA), Sophia Antipolis - Méditerranée, France; Moscow Institute of Physics and Technology (MIPT), Russia; National and Kapodistrian University of Athens, Greece; The University of Edinburgh, Scotland.
- **North America** — Center for Research in Computer Vision (CRCV), UCF, USA; Columbia University, USA; Computational Imaging Lab (CIL), UCF, USA; Google, USA; Missiles and Fire Control Division, Lockheed Martin Corporation, USA; University of California, Berkeley, USA; University of California, Irvine, USA; University of Kansas, School of Business, USA; University of North Carolina at Charlotte, USA; University of Southern California, Marshall School of Business, USA.

COLLABORATIVE
INDUSTRY PROJECTS

- Radiobotics, Copenhagen, Denmark, on *Multi-view Fracture Detection*, January 2022 – June 2022.
- Lockheed Martin Corporation Missiles and Fire Control, Orlando, FL 32819, on *Quadratic Correlation Filter*, January 2015–March 2017.
- “Math Modeling in Industry XVIII” workshop for graduate students, organized by Institute for Mathematics and its Application (IMA), held in University of British Columbia, in August 2014. Host company: EXXONMOBIL, project title: *Efficient and Robust Solution Strategies for Saddle-Point Systems*, under the supervision of Dr. Dimitar Tenev.
- “Math Modeling in Industry XIX” workshop for graduate students, organized by IMA, held in University of Minnesota, in August 2015. Host company: 1QB INFORMATION TECHNOLOGY, project title: *Sparse Recovery Using Quantum Annealing*, under the supervision of Pooya Ronagh and Prof. Michael Lamoureux.

SELECTED INVITED
TALKS

I have given more than 50 research talks at conferences, workshops, and seminars worldwide (Canada, Germany, Hong Kong, India, Italy, Morocco, Saudi Arabia, USA). Only selected talks are included below.

- 9th International Conference on Modeling, Simulation, and Applied Optimization, Marrakesh, Morocco, April 2023.
- Department of Computational and Data Sciences (CDS), Indian Institute of Science (IISc) Bangalore, India, January 2023.
- Department of Mathematics, School of Advanced Sciences, Vellore Institute of Technology, India, January 2023.
- “Stochastic Optimization Methods in Machine Learning–II” at the Seventh International Conference on Continuous Optimization 2022 (ICCOPT 2022), Bethlehem, Pennsylvania, USA, July 23-28, 2022.

- Eminent speaker at “Applications of Machine Learning” — Faculty Development Program at Dr. B. C. Roy Engineering College, Durgapur and MAKAUT Nodal Centre Zone, technically sponsored by ACM and Computer Society of India, February 26, 2022.
- INFORMS Annual meeting, Anaheim, CA, USA, October 2021.
- Minisymposium SIAM Conference on Optimization-2020 (SIOPT-20), Hong Kong, May-23-29, 2020.
- Special session “New Trends in Optimization Methods and Machine Learning-I and II” at the Sixth ICCOPT, Berlin, Germany, August 3-8, 2019.
- Joint Mathematics Meeting, American Mathematical Society’s (AMS) Annual Meeting, Baltimore, USA, January 2019.
- Special session “Stochastic Methods and Approximation Theory for Optimization-I and II”, INFORMS Annual meeting, Phoenix, AZ, USA, November 2018.
- Minisymposium “Computational methods for large-scale machine learning in imaging”, at SIAM Conference on Imaging Science, Bologna, Italy, June 2018.
- KAUST workshop on Optimization and Big Data, February 2018.
- AMS Sectional Meeting, Orlando, Florida, September 2017.
- AMS annual meeting at Atlanta, Georgia, January 2017.
- AMS annual meeting at San Antonio, Texas, January 2015.
- International Conference on Mathematics and Computing (ICMC 2013), jointly organized by Defense Research and Development Organization of India (DRDO), Indian Institute of Technology KGP, and HIT, December 2013.
- 79th annual conference of Indian Mathematically Society (IMS), December 2013.
- Colloquium talk at Tennessee Technological University, October 2013.
- Oral presentation in Thirty-Fourth AAAI Conference on Artificial Intelligence, New York, USA, February 2020.
- Oral presentation in Thirty-Third AAAI Conference on Artificial Intelligence, Hawaii, USA, January 2019.
- Spotlight presentation at WACV 2019—IEEE Winter Conference on the Applications of Computer Vision, Hawaii, USA, January 2019.
- Oral presentation at ICCV-Robust Subspace Learning workshop, Venice, Italy, October 2017.
- Poster presentation, The Statistical and Applied Mathematical Sciences Institute (SAMSI), Conference on Distributed and Parallel Data Analysis, September 2016.
- Poster presentation, The Statistical and Applied Mathematical Sciences Institute (SAMSI) Optimization Summer School, August 2016.
- Final presentation in *Math Modeling in Industry workshop for graduate students XIX* organized by Institute for Mathematics and its Application (IMA), Minnesota, August 2015. [Technical report and presentation.](#)
- Poster presentation, Graduate Research Forum, at UCF, March 2015.
- Final presentation in *Math Modeling in Industry workshop for graduate students XVIII* at University of British Columbia, Vancouver, organized by Institute for Mathematics and its Application (IMA), August 2014. [Technical report and presentation.](#)

SELECTED
CONFERENCE
PRESENTATIONS

SPECIAL SESSIONS
AND TUTORIALS
ORGANIZATION

- Special session titled “Stochastic Optimization Methods in Machine Learning–II” at the Seventh ICCOPT, Bethlehem, Pennsylvania, USA, July 23-28, 2022, jointly with El Houcine Bergou of UM6P.
- Special session titled “Stochastic Optimization Methods in Machine Learning” at the INFORMS Annual Meeting 2021, Anaheim, CA, USA, October 24-27, 2021, jointly with El Houcine Bergou of INRAE.
- Tutorial titled “Compressed Communication for Large-scale Distributed Deep Learning” jointly with El Houcine Bergou and Panos Kalnis at the 29th International Joint Conference on Artificial Intelligence and the 17th Pacific Rim International Conference on Artificial Intelligence, IJCAI-PRICAI 2020, January 2021, Yokohama, Japan (held virtually). [Project webpage](#), [Slides](#).
- Tutorial titled “Compressed Communication for Large-scale Distributed Deep Learning” jointly with El Houcine Bergou and Panos Kalnis at the 27th International Conference on Neural Information Processing (ICONIP 2020), November 2020, Thailand (held virtually). [Project webpage](#).
- Minisymposium titled “Stochastic Algorithms for Distributed Optimization” at the SIAM Conference on Optimization-2020 (SIOPT-20), Hong Kong, May-23-29, 2020, jointly with El Houcine Bergou of INRA and KAUST.
- Student Workshop Co-chair at the NeuRIPS 2019 Meetup, December 10-12, 2019, KAUST, KSA.
- Special session titled “New Trends in Optimization Methods and Machine Learning-I and II” at the Sixth ICCOPT, Berlin, Germany, August 3-8, 2019, jointly with El Houcine Bergou of INRA and KAUST.
- Special session titled “Optimal Methods in Applicable Analysis: Variational Inequalities, Low Rank Matrix Approximations, Systems Engineering, Cyber Security” (SS 81) at the AMS Joint Mathematics Meeting, Baltimore, USA, January 16-19, 2019, jointly with Ram N. Mohapatra, UCF.
- Special session titled “Stochastic Methods and Approximation Theory for Optimization-I and II” at the INFORMS Annual Meeting 2018, Phoenix, Arizona, November 4-7, 2018, jointly with El Houcine Bergou of INRA and KAUST.

SELECTED HONORS,
FELLOWSHIPS,
AWARDS

Best Reviewer Award (Top 10%) from the [International Conference on Machine Learning 2021 \(ICML 2021\)](#).

Outstanding Reviewer Award in [International Conference on Learning Representations \(ICLR 2021\)](#).

Professor Lee H. Armstrong Award for Distinguished Teachers, Department of Mathematics, UCF, 2017.

Outstanding Dissertation Award, Department of Mathematics, UCF, 2016.

Selected as one of 15 student recipients of UCF’s Graduate **Dean’s Dissertation Completion Fellowship**, Spring 2016. Fellowship amount: \$10,000 USD.

Graduate Research Assistantship, CRCV, UCF, Fall 2016.

Graduate Teaching Assistantship, UCF.

Graduate Research Assistantship for GAUSS PROJECT, a *Computational Science Training for Undergraduates in Mathematical Sciences* funded by NSF, 2011 and Summer 2012.

Merit scholarship for graduate studies, Indian Institute of Technology, Dhanbad, 2007-08. Fellowship amount: < 20,000 INR.

Ila Mukhopadhyay Memorial Medal for Best in Human Qualities, Presidency College, 2003-04.

SELECTED TRAVEL
AWARDS/GRANTS

IMADA travel support to attend ICCOPT 2022, Bethlehem, Pennsylvania, USA, July 2022.

KAUST comprehensive travel grant to attend SIOPT 2020, Hong Kong, May 2020; AAAI 2020, New York City, USA, February 2020; ICCOPT 2019, Berlin, August 2019; ICML 2019, Long Beach, CA, June 2019; AAAI 2019, Honolulu, Hawaii, January 2019; WACV 2019, Honolulu, Hawaii, January 2019; INFORMS Annual Meeting, Phoenix, Arizona, November 2018; SIAM Conference on Imaging Science, Bologna, Italy, June 2018; Applied Machine Learning Days workshop and conference, EPFL, Lausanne, Switzerland, January 2018; ICCV, Venice, Italy, October 2017; American Mathematical Society's Sectional Meeting, Orlando, Florida, September 2017.

IMA Travel Award (international airfare and ground transportation, lodging, food) for Integrating Machine Learning and Predictive Simulation: From Uncertainty Quantification to Digital Twins Workshop, March 2018.

SAMSI travel and lodging award, August 2016, September 2016.

UCF Mathematics department's conference registration and travel award, January 2015, November 2015, September 2016, January 2017.

IMA Travel Award (international airfare and ground transportation, lodging, food) for Math Modeling in Industry Workshop, August 2014 and August 2015.

Student Government Association's conference registration and travel award, UCF, August 2014, August 2016. Fellowship amount: \$250 USD each time.

Graduate Travel Fellowship, UCF, December 2013. Fellowship amount: \$650 USD.

PROFESSIONAL
ACTIVITIES

Co-Editor: inaugural Frontiers in Signal Processing "Rising Stars in Signal Processing Theory and Statistical Signal Processing 2022."

Editorial Board member: Signal Processing Theory, Frontiers in Signal Processing, March 2021—Present.

Session Chair: Twenty-Seventh International Conference on Neural Information Processing (ICONIP 2020).

Technical Program Committee: Winter Conference on Applications of Computer Vision (WACV 2020, 2021), AAAI Conference on Artificial Intelligence (2020, 2021, 2022, 2023), International Conference on Neural Information Processing (ICONIP 2020, 2021).

Conference Reviewer: of Neural Information Processing Systems (NeurIPS 2019, 2020, 2021, 2022), International Conference on Machine Learning (ICML 2019, 2020, 2021, 2022), International Conference on Learning Representations (ICLR 2021, 2022, 2023), International Conference on Artificial Intelligence and Statistics (AISTATS 2022), ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD 2021), IEEE International Conference on Computer Vision and Pattern Recognition (CVPR 2020, 2021, 2022), Asian Conference on Computer Vision (ACCV 2020), Winter Conference on Applications of Computer Vision (WACV 2022), IEEE International Conference on Computer Vision (ICCV 2017, 2021), IEEE 5th International Conference on Systems and Informatics (ICSAI 2018).

Journal Reviewer: Journal of Machine Learning Research (JMLR), IEEE Internet of Things (IoT), IEEE Journal on Selected Areas in Communications (JSAC), IEEE Transactions on Neural Network and Learning Systems (TNNLS), IEEE Transactions on Circuits and Systems for Video Technology (TCSVT), Journal of Optimization Theory and Applications—Springer (JOTA), International Journal for Light and Electron Optics—Elsevier (2018 Impact Factor: 1.914), IEEE Access (2016-'17 Impact Factor: 4.098), IEEE Transactions on Signal Processing (2018-'19 Impact Factor: 5.3), IEEE Journal of Special Topics in Signal Processing (2016-'17 Impact Factor: 5.301), SIAM Journal on Matrix Analysis and Applications (2015/2016 Impact Factor: 1.883), SIAM Journal on Imaging Sciences (2015/2016 Impact Factor: 2.687), Numerical Algorithms, Springer (2015/2016 Impact Factor: 1.367).

TEACHING
EXPERIENCE

Instructor at the SDU, Denmark for graduate class DM890: COMPUTER VISION. Duties included designing course and syllabi, writing and grading assignments and tests, lecturing, and holding office hours. Term(s): Spring 2023.

Instructor at the SDU, Denmark for graduate class DS827: LINEAR ALGEBRA FOR DATA SCIENCE. (Class capacity \approx 115 students)

Duties included designing syllabi, writing and grading quizzes and tests, lecturing, and holding office hours. Terms: Autumn 2022, 2023.

Instructor at the SDU, Denmark for undergraduate class DM579: LINEAR ALGEBRA WITH APPLICATIONS.

Duties included designing syllabi, writing and grading quizzes and tests, lecturing, and holding office hours. Term(s): Autumn 2023.

Instructor of record at the UCF, USA for undergraduate class CALCULUS II, CALCULUS III, MATRIX AND LINEAR ALGEBRA, PROBABILITY, RANDOM PROCESS AND APPLICATIONS (Class capacity 49-55 students). Duties included designing syllabi, writing and grading quizzes and tests, lecturing, and holding office hours. Terms: Spring 2014, Summer 2014, Fall 2014 (two sections), Summer 2015, Summer 2016, Fall 2016, Spring 2017, Summer 2022.

Teaching Assistant at the UCF for large class (over 250 students) of CALCULUS I, ORDINARY DIFFERENTIAL EQUATION, COLLEGE ALGEBRA.

Duties included holding recitations, office hours, grading quizzes, group activities, tests, and holding review sessions. Terms: Fall 2012, Fall 2013, Spring 2015, Fall 2015. Two sections in each term.

Mentor at the UCF for PRE-CALCULUS, CALCULUS I, II, AND III.

Duties included holding problem solving sessions. Terms: Spring 2013, Summer 2013.

Grader at the UCF for graduate class ADVANCED MATHEMATICS FOR ENGINEERS (MAP 5435). Duties included grading quizzes and homework assignments. Term: Summer 2012.

Assistant Professor of Mathematics, FIITJEE Limited, India, June 2008 – August 2010. I prepared student for Indian Institute of Technology Joint entrance Exam (IITJEE). The acceptance rate of IITJEE is less than 2%. In contrast, the acceptance rate of 5.8% at Harvard is amongst the lowest in the US. I have several students qualified for IITJEE.

SELECTED
COURSEWORK

Analysis 1 and 2, Advanced Linear Algebra and Matrix Theory, Scientific Computing, Advanced Numerical Mathematics, Mathematical Statistics, Ordinary Differential Equations and Applications, Partial Differential Equations, Approximation Techniques, Functional Analysis, Wavelets and Their Applications, Numerical Solutions of PDE, Introduction to Differential Geometry, Computer Vision, Complex Variables, Measure and Topology, Analysis of Low Dimensional Structure in High Dimensional Data, Operator Theory (as Directed Research class), Compressive Sensing (as Directed Research class).

COMPUTER
PROFICIENCY

MATLAB, Python, Julia, TensorFlow, Keras, \LaTeX .

PROFESSIONAL
RECOGNITION AND
HONORS

- American Mathematical Society - Graduate student member.
- SIAM - Graduate student member.
- Member of Computer Vision Foundation (CVF).
- Graduated with Udacity Deep Learning Nanodegree. [See certificate.](#)

REFERENCES

Prof. Panagiotis Kalnis
Professor of Computer Science
ECRC, KAUST

Phone: +966 (54) 470-0075
Email: panos.kalnis@kaust.edu.sa

Prof. Xin Li
Professor and Chair
Department of Mathematics
University of Central Florida
Email: xin.li@ucf.edu
Phone: +1 (407) 823-5984

Prof. Marco Canini
Associate Professor
ECRC, KAUST
Phone: +966 (12) 808-0489
Email: marco@kaust.edu.sa

Prof. Ram Mohapatra
Professor and Academic Director
Department of Mathematics
University of Central Florida
Phone: +1 (407) 823-5080
Email: ram.mohapatra@ucf.edu

Dr. Jakub Marecek
Research Staff Member, IBM Research–
Dublin; Faculty, Department of Com-
puter Science, Czech Technical University
in Prague; Optimization Specialist, CEZ;
Adjunct Associate Professor, University
College Dublin
Email: jakub@marecek.cz

Prof. Peter Richtárik
Professor of Applied Mathematics and Computer Science
EPSRC Fellow in Mathematical Sciences; Turing Fellow,
The Alan Turing Institute
Visual Computing Center (VCC), KAUST
Phone: +966 (54) 470-0462
Email: peter.richtarik@kaust.edu.sa

Prof. Qiyu Sun
Professor and Graduate Coordinator
Department of Mathematics
University of Central Florida
Email: qiyu.sun@ucf.edu
Phone: +1 (407) 823-4839

Prof. Suhaib A Fahmy
Reader in Computer Engineering
School of Engineering, University of Warwick
Phone: +44 (0) 24 7657-5471
Email: s.fahmy@warwick.ac.uk

Prof. Zuhair Nashed
Professor and Fellow of American Mathematical Society
Department of Mathematics
University of Central Florida
Phone: +1 (407) 823-0445
Email: zuhair.nashed@ucf.edu