

Supun Nakandala

Phone: (+1) 812-558-6888
Email: snakanda@eng.ucsd.edu
Web: <https://scnakandala.github.io>

3232 EBU3B CSE
9500 Gilman Drive
La Jolla, CA 92093

Education	University of California, San Diego Sept 2017 - March 2022 (Expected) <i>Ph.D.</i> , Computer Science. Thesis Title: <i>Multi-Query Optimization for Deep Learning Systems</i> Thesis Advisor: Arun Kumar Committee Members: Arun Kumar (chair), Yannis Papakonstantinou, Geoffrey Voelker, Lawrence Saul, Loki Natarajan
	University of California, San Diego Sept 2017 - June 2020 <i>M.Sc.</i> , Computer Science. GPA: 3.97/4.00
	University of Moratuwa, Sri Lanka Aug 2010 - April 2015 <i>B.Sc.</i> , Computer Science. GPA: 4.11/4.20 Department Topper and Gold Medalist
Professional Experience	Microsoft - Research Intern June 2021 - Sept 2021 Team: Microsoft Research Data Systems Group Mentor: Vivek Narasayya Designed and evaluated resource management schemes for serverless databases.
	Amazon Web Services - Software Engineering Intern June 2020 - Sept 2020 Team: Redshift Mentor: Yannis Papakonstantinou Designed and implemented components of Redshift ML , the in-database ML feature of the Redshift data warehouse that went to public preview.
	Microsoft - Research Intern June 2019 - Sept 2019 Team: Gray Systems Lab Mentor: Matteo Interlandi Designed and implemented the Hummingbird system, a compiler for translating classical machine learning pipelines into tensor computations for optimized ML scoring.
	Indiana University - Research Software Developer Oct 2015 - Aug 2017 Team: Science Gateways Research Center Manager: Marlon Pierce Contributed to the development of the Apache Airavata system, which is a software framework to execute and manage computational applications and workflows.
	Conference Publications <i>Nautilus: An Optimized System for Deep Learning-based Active Transfer Learning</i> Supun Nakandala and Arun Kumar Under Submission
<i>Cerebro: A Layered Data Platform for Scalable Deep Learning</i> Arun Kumar, Supun Nakandala , Yuhao Zhang, Side Li, Advitya Gemawat, and Kabir Nagrecha CIDR 2021 (Vision paper) Paper	
<i>Cerebro: A Data System for Optimized Deep Learning Model Selection</i> Supun Nakandala , Yuhao Zhang, and Arun Kumar VLDB 2020 Paper	
<i>A Tensor Compiler for Unified Machine Learning Prediction Serving</i> Supun Nakandala , Karla Saur, Gyeong-In Yu, Konstantinos Karanasos, Carlo Curino, Markus Weimer, and Matteo Interlandi OSDI 2020 Paper	

Vista: Declarative Feature Transfer from Deep CNNs at Scale
Supun Nakandala and Arun Kumar
SIGMOD 2020 | [Paper](#)

Extending Relational Query Processing with ML Inference
Konstantinos Karanasos, Matteo Interlandi, Doris Xin, Fotis Psallidas, Rathijit Sen, Kwanghyun Park, Ivan Popivanov, **Supun Nakandala**, Subru Krishnan, Markus Weimer, Yuan Yu, Raghu Ramakrishnan, Carlo Curino
CIDR 2020 | [Paper](#)

Incremental and Approximate Inference for Faster Occlusion-based Deep CNN Explanations
Supun Nakandala, Arun Kumar, and Yannis Papakonstantinou
SIGMOD 2019 | [Paper](#)
Honorable Mention for Best Paper Award
Invited to TODS 2020
Invited to SIGMOD Research Highlight 2020

Gendered Conversation in a Social Game-Streaming Platform
Supun Nakandala, Giovanni Cimpaglia, Norma Su, and Yong-Yeol Ahn
AAAI ICWSM 2017 | [Paper](#)

Apache Airavata Sharing Service: A Tool for Enabling User Collaboration in Science Gateways
Supun Nakandala, Suresh Marru, Marlon Piece, Sudhakar Pamidighantam, Kenneth Yoshimoto, Terri Schwartz, Subhashini Sivagnanam, Amit Majumdar, Mark Miller
PEARC 2017 | [Paper](#)

Apache Airavata Security Manager: Authentication and Authorization Implementations for a Multi-Tenant eScience Framework
Supun Nakandala, Hasini Gunasinghe, Suresh Marru, and Marlon Pierce
IEEE e-Science 2016 | [Paper](#)

Anatomy of the SEAGrid Science Gateway
Supun Nakandala, Sudhakar Pamidigantam, Suresh Marru, Marlon Pierce
PEARC 2016 | [Paper](#)

Journal Publications

The CNN Hip Accelerometer Posture (CHAP) Method for Classifying Sitting Patterns from Hip Accelerometers: A Validation Study in Older Adults
Supun Nakandala*, Mikael Anne*, Marta M. Jankowska, Dori Rosenberg, Fatima Tuz-Zahra, John Bellettiere, Jordan Carlson, Paul R. Hibbing, Jingjing Zou, Andrea Z. LaCroix, Arun Kumar, and Loki Natarajan (* Co-first author)
Medicine & Science in Sports & Exercise, 2021

Application of Convolutional Neural Network Algorithms for Advancing Sedentary and Activity Bout Classification
Supun Nakandala, Marta Jankowska, Fatima Tuz-Zahra, John Bellettiere, Jordan Carlson, Andrea LaCroix, Sheri Hartman, Dori Rosenberg, Jingjing Zou, Arun Kumar, and Loki Natarajan
Journal for the Measurement of Physical Behavior, 2021 | [Paper](#)

Query Optimization for Faster Deep CNN Explanations
Supun Nakandala, Arun Kumar, and Yannis Papakonstantinou
SIGMOD Record 2020 (**SIGMOD Research Highlight Award**) | [Paper](#)

Incremental and Approximate Computations for Accelerating Deep CNN Inference
Supun Nakandala, Kabir Nagrecha, Arun Kumar, and Yannis Papakonstantinou
 TODS 2020 (Invited Paper) | [Paper](#)

Vision, Workshop, and Demo Publications *Tensors: An Abstraction for General Data Processing*
 Dimitrios Koutsoukos, **Supun Nakandala**, Karla Saur, Konstantinos Karanasos, Gustavo Alonso, and Matteo Interlandi
 VLDB 2021

Intermittent Human-in-the-loop Model Selection using Cerebro: A Demonstration
 Liangde Li, **Supun Nakandala**, and Arun Kumar
 VLDB 2021 | [Paper](#)

Compiling Classical ML Pipelines into Tensor Computations for One-size-fits-all Prediction Serving
Supun Nakandala, Gyeong-In Yu, Matteo Interlandi, and Markus Weimer
 NeurIPS 2019 MLSys Workshop | [Paper](#)

Cerebro: Efficient and Reproducible Model Selection on Deep Learning Systems
Supun Nakandala, Yuhao Zhang, and Arun Kumar
 SIGMOD 2019 DEEM Workshop | [Paper](#)

Demonstration of Krypton: Optimized CNN Inference for Occlusion-based Deep CNN Explanations
 Allen Ordookhanians, Xin Li, **Supun Nakandala**, and Arun Kumar
 VLDB 2019 Demo | MLSys 2019 Demo | [Paper](#)

Materialization Trade-offs for Feature Transfer from Deep CNNs for Multimodal Data Analytics
Supun Nakandala, Arun Kumar
 MLSys 2018 Short paper | [Paper](#)

Research Impact [CHAP models](#) are now the state-of-the-art method for identifying sedentary behavior from hip-worn accelerometer data for public health applications 2021
 Microsoft open-sourced [Hummingbird](#) system and uses it in ONNX ML Tools 2020
 Ideas from project CEREbro integrated into [MADlib/Greenplum](#) by VMWare 2019
 CEREbro system is being used by behavioral science researchers at UCSD 2019
 “Gendered Conversation in a Social Game-Streaming Platform” paper gains [media attention](#) and creates awareness about the bleak issue of sexism in online gaming 2017
 APACHE AIRAVATA science gateways middleware and the SEAGRID science gateway are [widely used](#) by computational science researchers to execute and manage computational jobs on university clusters and national supercomputing infrastructure 2017

Patents Pending US Patent Application: *Query Optimization for Deep Convolutional Neural Network Inferences*
 Arun Kumar and Supun Nakandala

Pending US Patent Application: *Accelerating Inference of Traditional ML Pipelines with Neural Network Frameworks*
 Matteo Interlandi, Markus Weimer, Saeed Amizadeh, Konstantinos Karanasos, Supun Nakandala, Karla J. Saur, Carlo Aldo Curino and Gyeongin Yu

Scholarships and Awards SIGMOD research highlight award SIGMOD - 2020
 Student grant to attend OSDI 2020 USENIX - 2020

SIGMOD best paper honorable mention award	SIGMOD - 2019
NSF travel award to attend SIGMOD 2019	NSF - 2019
Gold medal for the best academic performance	University of Moratuwa - 2015
Travel award to attend South Asia Workshop on Research	NUS Singapore - 2014
Mahapola higher education merit scholarship	Govt. of Sri Lanka - 2010

Teaching Experience	Teaching Assistant - Systems for Scalable Analytics	UCSD - Winter 2020
	Teaching Assistant - Advanced Data Analytics Systems	UCSD - Spring 2019

Service	Program Committee:
	VLDB: 2022

External Reviewer:
VLDB: 2019

Mentoring Student Research Projects:

Liangde Li, MS UCSD 2021
Allen Ordookhanians, MS UCSD 2019
Xin Li, MS UCSD 2019

Advitya Gemawat, BS UCSD 2021
Kabir Nagrecha, BS UCSD 2021