Shamak Dutta

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🖥 https://shamak.github.io

Academic Positions

May 2024 – now
Postdoctoral Scholar, *University of Waterloo*, Canada.
Advisors: Yash Pant & Stephen L. Smith
Flight planning and controls (research collaboration with Airbus).

Education

April 2024
PhD in Electrical and Computer Engineering, *University of Waterloo*, Canada.
Advisor: Stephen L. Smith
Faculty of Engineering Award, Electrical and Computer Engineering ($1.5k) (2023)
Graduate Research Dissemination Award, Faculty of Engineering (2023)
University of Waterloo Graduate Scholarship ($1.2k) (2022)
Teaching Assistant Award, Faculty of Engineering (2021)
Thesis: Resource Constrained Linear Estimation in Sensor Scheduling & Informative Path Planning

August 2019
Masters in Systems Design Engineering, *University of Waterloo*, Canada.
Advisors: Bryan Tripp & Graham Taylor
Vector Institute Research Award ($4k) (2018, 2019)
University of Waterloo Graduate Scholarship ($1k) (2019)
International Master's Student Award ($6.5k) (2018, 2019)
Thesis: Correlated Noise in Deep Convolutional Neural Networks

April 2017
Bachelors in Computer Engineering, *University of Waterloo*, Canada.
Engineering International Student Scholarship ($20k) (2013)
President's Scholarship of Distinction ($2k) (2013)
President's Research Award ($1.5k) (2015)
GPA: 3.7/4.0 (Distinction)

Publications & Preprints

2024
Informative Path Planning for Active Regression with Gaussian Processes via Sparse Optimization.
S. Dutta, N. Wilde, S. L. Smith
under revision, Transactions on Robotics (T-RO), 2024.

2023
A Unified Approach to Optimally Solving Sensor Scheduling and Sensor Selection Problems in Kalman Filtering.
S. Dutta, N. Wilde, S. L. Smith
62nd IEEE Conference on Decision and Control (CDC), 2023.

2023
Approximation Algorithms for Robot Tours in Random Fields with Guaranteed Estimation Accuracy.
S. Dutta, N. Wilde, P. Tokekar, S. L. Smith
International Conference on Robotics and Automation (ICRA), 2023

2022
Informative Path Planning in Random Fields via Mixed Integer Programming.
S. Dutta, N. Wilde, S. L. Smith
61st IEEE Conference on Decision and Control (CDC), 2022.

2022
An Improved Greedy Algorithm for Subset Selection in Linear Estimation.
S. Dutta, N. Wilde, S. L. Smith
20th European Control Conference (ECC), 2022.

2018 **Convolutional Neural Networks Regularized by Correlated Noise**.
S. Dutta, B. Tripp, G. Taylor
15th Canadian Conference on Computer and Robot Vision (CRV), 2018.

2016 **Barcodes for Medical Image Retrieval Using Autoencoded Radon Transform**.
H. Tizhoosh, C. Mitcheltree, S. Zhu, and **S. Dutta**
23rd International Conference on Pattern Recognition (ICPR), 2016.

Research Experience

2018 **Research Intern**, *Preferred Networks*, Tokyo, Japan.
Advisors: Shunta Saito & Masaki Saito
Scene prediction/generation using generative modeling.

2017 **Research Intern**, *Latent Logic (now Waymo)*, Oxford, United Kingdom.
Advisors: Joao Messias & Shimon Whiteson
3D pose estimation from 2D video.

2016 **Research Intern**, *Amazon Search*, Palo Alto, USA.
Advisors: Bing Yin & Erick Cantu-Paz
Ranking search results on Amazon.com using neural networks.

2016 **Undergraduate Student**, *Adaptive Systems Lab*, University of Waterloo, Canada.
Advisor: Dana Kulic
Regression methods for human motion prediction.

2016 **Undergraduate Student**, University of Waterloo, Canada.
Advisor: Stephen L. Smith
Heuristics for the Generalized Traveling Salesman Problem.

2015 **Undergraduate Student**, *KIMIA Lab*, University of Waterloo, Canada.
Advisor: Hamid Tizhoosh
Image compression and retrieval using neural networks.

Internships

2018 **Research Intern**, *Preferred Networks*, Tokyo, Japan.

2017 **Research Intern**, *Latent Logic (now Waymo)*, Oxford, UK.

2016 **Research Intern**, *Amazon Search*, Palo Alto, USA.

2016 **Software Engineer Intern**, *Amazon Advertising*, Palo Alto, USA.

2015 **Software Engineer Intern**, *Lookout Security*, San Francisco, USA.

2014 **Software Engineer Intern**, *Avvasi*, Waterloo, Canada.

2014 **Software Engineer Intern**, *Achievers Inc.*, Toronto, Canada.

2013 **Software Engineer Intern**, *pVelocity*, Toronto, Canada.

Teaching Experience

2023 **Teaching Assistant**, Algorithms & Data Structures (ECE 250).
Student rating: 4.83/5

2022 **Teaching Assistant**, Probability Theory & Stats II (ECE 307).
Student rating: 5/5

2022 **Teaching Assistant**, Probability Theory & Stats I (ECE 203).
Student rating: 4.67/5

2022	**Teaching Assistant**, Algorithm Design & Analysis (ECE 406).
	Student rating: 5/5
2021	**Teaching Assistant**, Probability Theory & Stats II (ECE 307).
	Student rating: 4.95/5
2021	**Teaching Assistant**, Algorithms & Data Structures (ECE 250).
	Student rating: 4.88/5
2020	**Teaching Assistant**, Algorithm Design & Analysis (ECE 406).
	Student rating: 4.71/5

Grant Writing

2024	**NSERC Alliance Grant**, *$300,000*, Extensive contributions on research proposal, budget planning, and project management.

Academic Service

Reviewer: Transactions on Robotics (T-RO), Conference on Robot Learning (CoRL), International Conference on Intelligent Robots and Systems (IROS), International Conference on Robotics and Automation (ICRA), Conference on Decision and Control (CDC), American Control Conference (ACC), Automatica

Courses (credit or audit)

UW (Graduate): Intro. to Optimization (J. Geelen), Convex Analysis & Optimization (H. Wolkowicz), Continuous Optimization (L. Tuncel), Combinatorial Optimization (C. Swamy), Functional Analysis (G. Tran), Stochastic Processes (W. Zhuang), Estimation & Hypothesis Testing (L. Zeng), Optimal Control (N. Azad), Stochastic Control (S. Smith), Model Predictive Control (Y. Pant), Computational Neuroscience (B. Tripp).

UW (Bachelors): Machine Learning (P. Poupart), Pattern Recognition (A. Wong), Quantum Mechanics (M. Reimer), Probability Theory (R. Mazumder), Robotics & Control (D. Kulic), Adaptive Algorithms (O. Basir), Computer Networks (S. Naik), Analog Communications (W. Zhuang), Analog Control (S. Smith), Compilers (V. Ganesh), Discrete Math (M. Pei).