

AREAS OF EXPERTISE	Data Science, Spatiotemporal Statistics, Machine Learning, Geometric Data Analysis, Climate Science, Robotics, Computer Vision, and End-To-End Software Product Development.
PROJECT HIGHLIGHTS	<p>I develop data science models for predicting and explaining complex, high-dimensional, and unstructured datasets. Highlights of my contributions towards high-impact applications include:</p> <ul style="list-style-type: none"> • Deployed the integrated web application environment of Python, PostgreSQL, and Flask to AWS that provides a plan to maximize the user's travel experience — bit.ly/TripTranscender • Developed statistical models for various challenges in climate sciences, such as a non-stationary model for future projections, a data-fusion model for inference from multiple sources, and an emulator for Earth System Models — bit.ly/SpatialML • Benchmarked and improved the performance of machine learning models, such as deep learning and decision trees, for forecasting a quasi-periodic phenomenon • Developed end-to-end software products for a real-time, large-scale system to provide situational awareness of complex urban environments for unmanned military vehicles
PROGRAMMING SKILLS	Python, R, C++, C, SQL, Java, Matlab, Maple, Perl, HTML, Shell Scripting, TensorFlow, PyTorch, OpenCV, IPP, LaTeX, GAMS, Pro/E, AutoCAD, FPGA, Flask, Git, ArchGIS, CoLab, and AWS.
EDUCATION	<p>Ph.D., Computer Science, Rutgers University - New Brunswick, USA 2011 - 2017 Thesis: High-Dimensional Manifold Geostatistics (Conferred, Jan 2019) Advisors: Dr. Dimitris Metaxas (Computer Vision, Machine Learning) Dr. Douglas Nychka (Spatiotemporal Data Science)</p> <p>M.S., Mechanical Engineering, University of Pennsylvania, USA 2003 - 2005 Thesis: Passive Reconfigurable Robots Advisors: Dr. Vijay Kumar (Robotics), Dr. Daniel Lee (Machine Learning)</p> <p>B.S., Mechanical Engineering, University of Mumbai, India 1999 - 2003 Specialization: Fluid Dynamics</p>
INDUSTRY POSITION	<p>Data Science Fellow, Insight, Remote, USA 2020 Role: Deployed end-to-end big data product for planning day trips to tourist destinations that takes one beyond just the main tourist attractions. Supervisors: A cohort of data science fellows and industry experts</p> <p>Senior Software Engineer, General Dynamics Robotics Systems, USA 2006 - 2010 Role: Developed end-to-end software products for providing situational awareness to unmanned ground, air, and surface vehicles. Supervisor: Dr. Minbo Shim (Applied Machine Learning), Dr. Barry Bodt (Applied Statistics)</p>
ACADEMIC POSITIONS	<p>Postdoctoral Research Associate, University of Minnesota - Twin Cities, USA 2018 - 2019 Role: Developed high-dimensional spatiotemporal models, reviewed manuscripts for machine learning conferences, and wrote grant proposals. Advisor: Dr. Arindam Banerjee (Machine Learning)</p> <p>Predoctoral Research Fellow, National Center for Atmospheric Research, USA 2015 - 2017 Role: Developed novel non-stationary spatiotemporal models and a statistical emulator for climate data science. Advisors: Dr. Douglas Nychka, Dr. Claudia Tebaldi (Spatiotemporal Statistics)</p> <p>Research Fellow, Rutgers University - New Brunswick, USA 2013 - 2015 Role: Developed high-dimensional manifold models for the areas of national needs, such as medical imaging, computer vision and sea-level changes. Advisors: Dr. Dimitris Metaxas, Dr. Vladimir Pavlovic (Machine Learning)</p> <p>Teaching Assistant, Rutgers University - New Brunswick, USA 2011 - 2013 Role: Developed hands-on educational demos for core computer science courses. Advisor: Dr. Dimitris Metaxas (Computer Science)</p>

- Information Geometric View of Pattern Scaling, Bayesian Hierarchical Regional Clustering for Climate Model Outputs** 2015 - 2017
 IMAGE, National Center for Atmospheric Research
 Developed tools for comparing and emulating climate model outputs using Bayesian hierarchical models and information geometry.
- Data-mining Tide Gauge Datasets for Analyzing Sea-level Rise** 2013 - 2017
 DIMACS, Rutgers University
 Developed models for regional sea-level rise around the US coastline using state-of-the-art statistical techniques.
- Reconstructing Spatio-temporal Atlases of the Corpus Callosum** 2013
 CBIM Center, Rutgers University
 Analyzed the data of diffusion tensor images of an aging brain using second-order statistics on the manifold to predict and treat neurological and psychiatric diseases.
- 3D Pose Reconstruction** 2012
 CBIM Center, Rutgers University
 Implemented a state-of-the-art machine learning technique called the Bayesian mixture of experts for the purpose of reconstructing a 3D human pose from a video sequence.
- Passive Reconfigurable Robot** 2005
 GRASP Laboratory, University of Pennsylvania
 Formulated heuristics of a control algorithm based on the theory of Graph Grammars such that the robotic modules would self-assemble into an optimal geometric structure for the task of locomotion.
- Cable Robot** 2004 - 2005
 GRASP Laboratory, University of Pennsylvania
 Designed and fabricated the mechanical and electrical components of a cable robot. To localize the cable robot in a 3D space, I implemented the Rao-Blackwellised particle filter.

PUBLICATIONS

Peer-Reviewed Publications

- [P1] **Chintan Dalal**, Douglas Nychka, and Claudia Tebaldi, *Covariance structure analysis of climate model output*, Sixth International Workshop on Climate Informatics, 2016. [Most notable paper]
- [P2] **Chintan Dalal**, Vladimir Pavlovic, and Robert Kopp, *Sea level estimation using the Riemannian manifold and a non-stationary covariance function*, Fifth International Workshop on Climate Informatics, 2015. [Most notable paper]
- [P3] Jonathan Williford, **Chintan Dalal**, and Minbo Shim, *Spatial multi-modal mean background model for real-time MTI*, Proc. SPIE, vol. 7338, pp. 73380A, 2009.
- [P4] Barry Bodt and **Chintan Dalal**, *Performance evaluation of human detection systems*, Whitepaper document, Army Research Lab & General Dynamics Robotics Systems, Maryland, 2007.

Peer-Reviewed Abstracts

- [A1] **Chintan Dalal**, Vladimir Pavlovic, and Robert Kopp, *Estimating the ocean surface level using the intrinsic non-stationary covariance function*, American Geophysical Union, 2015.

Non-Peer-Reviewed Papers

- [N1] **Chintan Dalal**, Vladimir Pavlovic, and Robert Kopp, *Intrinsic non-stationary covariance function for climate modeling*, ArXiv e-prints, 2015.

Papers In Preparation/Submission

- [I1] **Chintan Dalal** and Arindam Banerjee, *Sub-seasonal to seasonal forecasting for a quasi-periodic phenomena*, 2019.
- [I2] **Chintan Dalal**, Douglas Nychka, Vladimir Pavlovic, and Robert Kopp, *Non-stationary Gaussian process model*, 2019.
- [I3] **Chintan Dalal**, Douglas Nychka, Vladimir Pavlovic, and Robert Kopp, *Multi-source non-stationary Gaussian process model*, 2019.
- [I4] **Chintan Dalal**, Douglas Nychka, and Claudia Tebaldi, *Statistical emulator using manifold representation of climate model outputs*, 2019.

REVIEWED CONFERENCES	Conference on Neural Information Processing Systems International Conference on Machine Learning	2018 2018
PRESENTATIONS	Covariance Structure Analysis of Climate Model Output National Center for Atmospheric Research, International Climate Informatics Workshop	2016
	Sea-Level Estimation Using the Riemannian Manifold and a Non-stationary Covariance Function National Center for Atmospheric Research, International Climate Informatics Workshop	2015
	Estimating Sea-Level Distribution Rutgers University, Center for Discrete Mathematics and Theoretical Computer Science	2014
	Non-Linear Dimensionality Reduction University of Pennsylvania, Mathematics Department	2005
POSTERS	Spatio-temporal Analysis of the Ocean Surface Level Mathematics of Planet Earth 2013+ Workshop on Management of Natural Resources	2015
	Sea-Level Estimation using Intrinsic Statistics and a Non-stationary Covariance Function Carnegie Mellon University, DHS Annual Research Workshop	2015
	Simultaneous Localization and Mapping for a Cable Actuated Robot University of Pennsylvania, GRASP Laboratory Symposium.	2005
	Passive Reconfigurable Robot University of Pennsylvania, GRASP Laboratory Symposium	2005
TEACHING EXPERIENCE	Mentoring Graduate Students , University of Minnesota at Twin Cities	2018
	Teaching Assistant , Rutgers University	2011 - 2013
	• Course: Numerical Analysis and Computing	2013
	• Course: Discrete Structures I	2012
	• Courses: Introduction to Computer Science, Introduction to Data Structures	2011
	Average instructor rating from student evaluations: 4/5 Prepared educational demos, held recitations, and wrote perl scripts to automate the grading process.	
	Teaching Assistant , University of Pennsylvania Course: Statics and Strength of Materials & Mechanics of Materials Lectured classes and live demos for explaining the effects of stress on different materials.	2005
	Mentoring Undergraduate NSF Summer Fellows , University of Pennsylvania	2004