Sharvaree Vadgama

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Education

University of California, San Diego		December 2025 - (on-going)
Post-doctoral researcher		*San Diego, USA*
University of Amsterdam	December 2020 – November 2025 (defence pending)	
Doctoral research in Geometry + Generative Modeling		*Amsterdam , The Netherlands*
University of Utah		August 2017 – May 2020
MS in Computing		*Salt Lake City, Utah, USA*
Indian Institute of Science Education and Research, Pune		August 2011 – May 2016
BS-MS in Theoretical Physics		*Pune, India*

Research Focus

My PhD research is focused on adding ***geometric structure*** to Generative Modeling, enabling better representations. More broadly, I am interested in leveraging inductive biases to enable data-efficient learning and AI4Science.

Research Experience

Research Intern *(with Eero Simoncelli)* — May 2025 - August 2025
CCN, Flatiron Institute — *New York City, USA*
- Understanding inductive biases of self-attention.

Research Intern (remote) — August 2024 - November 2024
New Theory — *San Francisco, USA*
- Scalable geometric deep learning architectures.

PhD research — December 2020- (ongoing)
AMLab, University of Amsterdam — *Amsterdam, The Netherlands*
- **Kendall-shape VAEs and its continuous version** Learning shapes in an equivariant generative framework with discrete and continuous landmarks.
- **PONITA**: SE(3) Equivariant diffusion models for generating molecules efficiently in position-orientation space and making them scalable
- **Clifford generative models** for generating point-clouds and proteins. (ongoing)

Research Assistant — June 2018-May 2019
Machine Learning Lab, University of Utah — *Salt Lake City, Utah, USA*
- Developed a robust clustering algorithm for k-means and k-center algorithms which clusters data with clustering guarantees.

Interests

Generative models,   Geometric deep learning,   AI4Science,   Science of deep learning

Teaching and Supervision Experience

Supervision of *four* Masters students' thesis 2021-2023
Masters in Artificial Intelligence program, University of Amsterdam *Amsterdam, The Netherlands*

Teaching Assistant 2021-2022
University of Amsterdam *Amsterdam, The Netherlands*
- Teaching assistance for Machine Learning I, Machine Learning II, and Deep Learning II course.
- Conducted lab and theory sessions for Machine Learning I and Machine Learning II courses. Helped develop course material for the Deep Learning II and mathematics for Machine Learning lectures.

Teaching Assistant 2017-2018
University of Utah *Salt Lake City, Utah, USA*
- Taught and conducted office hours for the Introduction to Robotics course.

Research Presentations

Scale vs Symmetry - *Understanding equivariance at scale*, CCN Lab group meeting, Flatiron Institute, USA.

Geometry-grounded representations - *from geometric VAEs, to equivariant diffusion models for molecules and beyond*, University of California, San Diego, USA .

***Generalized* Kendall Shape spaces for learning shapes** - *Learning continuous shapes in a Generative framework*, at AIM2023, Twente, Netherlands.

Kendall Shape VAE - *Learning shapes in a Generative framework*, Oral at NeurReps workshop at NeurIPS 2022, New Orleans, USA.

Awards

CaLISTA (COST action) Travel grant 2023
Cartan geometry, Lie, Integrable Systems, quantum group Theories for Applications

HI Consortium PhD position 2020
Hybrid Intelligence Consortium PhD and research travel grant

NeurIPS Conference Travel award 2019

WiML Travel award 2019
Women in Machine Learning travel award

IISER INSPIRE Research fellowship 2011-2016
Indian Institute of Science Education and Research, Pune

Outreach

Organizer GRaM 2.0 workshop at ICLR 2026
Scientific Methods for Understanding Deep Learning

Organizer Sci4DL workshop at ICLR 2026
Scientific Methods for Understanding Deep Learning

Program Committee Chair TAG DS conference co-located with NeurIPS 2025
Topology, Algebra, and Geometry in Data Science

Primary Organizer and Co-chair for GRaM Workshop at ICML 2024
Geometry-grounded representation learning and generative modeling Workshop *140+ submissions*

Organizer for GeMSS summer school 2023, 2024
Generative Modeling Summer School, Copenhagen & Eindhoven *200 participants*

Organizer for Women in AI Amsterdam chapter 2023- 2025

Selected publications

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†denotes Equal Contribution

Sharvaree Vadgama, Mohammad M. Islam, Domas Buracus, Christian Shewmake, Artem Moskalev, & Erik Bekkers (2025). "Probing Equivariance and Symmetry Breaking in Convolutional Networks" **NeurIPS 2025**.

Sharvaree Vadgama †, Julia Balla †, Ryley Mcconkey, Erik Bekkers, Abigail Bodner, Tess Smidt "Flexibly Equivariant Generative framework for Stochastic sub-grid Turbulence modeling" **(FastML 2025)** (extended abstract).

Sharvaree Vadgama & Erik Bekkers (2025). "Rapidash: Scalable Molecular Modeling Through Controlled Equivariance Breaking " GenBio Workshop, **ICML 2025**.

Mohammad Mohaiminul Islam, Thijs P. Kuipers, **Sharvaree Vadgama**, Coen de Vente, Afsana Khan, Clara I. Sánchez, Erik J. Bekkers (2025). "Longitudinal Flow Matching for Trajectory Modeling" *in submission, AISTATS 2026*.

Mohammad Mohaiminul Islam, Rishabh Anand *, David R. Wessels *, Friso de Kruiff, Thijs P. Kuipers, Rex Ying, Clara I. Sánchez, **Sharvaree Vadgama** †, Georg Bökman †, Erik J. Bekkers (2025). "Platonic Transformers: A Solid Choice For Equivariance", *in submission, ICLR 2026*.

Andrew Draganov, **Sharvaree Vadgama**, Sebastian Damrich, Jan Niklas Böhm, Lucas Maes, Dmitry Kobak, Erik J Bekkers (2025). "On the Importance of Embedding Norms in Self-Supervised Learning" **ICML 2025**.

Floor Eijkelboom†, Heiko Zimmermann, **Sharvaree Vadgama**, Erik Bekkers, Max Welling, Christian Naesseth & Jan-Willem van de Meent (2025). "Controlled Generation with Equivariant Variational Flow Matching" **ICML 2025**.

Sharvaree Vadgama†, Cong Liu †, David Ruhe, Erik Bekkers & Patrick Forre (2025). "Clifford group equivariant diffusion models for 3D Molecular Generation", FPI Workshop, **ICLR 2025**.

David R Wessels †, David M Knigge †, Samuele Papa, Riccardo Valperga, **Sharvaree Vadgama**, Efstratios Gavves, Erik J Bekkers (2024). "Grounding Continuous Representations in Geometry: Equivariant Neural Fields ", **ICLR 2025**.

Putri A Van der Linden, Alejandro García-Castellanos, **Sharvaree Vadgama**, Thijs P Kuipers, Erik J Bekkers (2024). "Learning symmetries via weight-sharing with doubly stochastic tensors ", **NeurIPS 2024**.

Guillermo Bernárdez et al (including **Sharvaree Vadgama**) (2024). "ICML Topological Deep Learning Challenge 2024: Beyond the Graph Domain ", **GRaM Workshop, ICML 2024**.

Sharvaree Vadgama, Erik Bekkers, Alison Pouplin, Sekou-Oumar Kaba, Robin Walters, Hannah Lawrence, Tegan Emerson, Henry Kvinge, Jakub Tomczak, Stephanie Jegelka (2024)."Preface to Geometry-grounded Representation Learning and Generative Modeling (GRaM) Workshop ", **GRaM Workshop, ICML 2024**.

Andrew Draganov, **Sharvaree Vadgama**, Erik J Bekkers (2024). "The hidden pitfalls of the cosine similarity loss ", **HiLD Workshop, ICML 2024**.

Sharvaree Vadgama †, Erik Bekkers†, Rob Hesselink, Putri van der Linden, and David Romero (2023). "Fast, Expressive SE(n) Equivariant Networks through Weight-sharing in Position-Orientation Space ", **ICLR 2024**.

Vivien van Veldhuizen, **Sharvaree Vadgama**, Onno de Boer, Sybren Meijer & Erik Bekkers (2023). "Modeling Barrett's Esophagus Progression using Geometric Variational Autoencoders", CaPTion Workshop (full paper) **MICCAI 2023**.

Yeskendir Koishekenov, **Sharvaree Vadgama†**, Riccardo Velaperga† & Erik Bekkers (2023). "Geometric Contrastive Learning." VIPriors Workshop (full paper), **ICCV 2023**. *(selected for **Oral presentation**)*

Sharvaree Vadgama, Jakub Mikolaj Tomczak, & Erik Bekkers (2023). "Continuous Kendall Shape-VAE." International Conference on Geometric Science of Information, **GSI 2023**. *(selected for **Oral presentation**)*

Sharvaree Vadgama, Jakub Mikolaj Tomczak, & Erik Bekkers (2022). "Kendall Shape-VAE: Learning Shapes in a Generative Framework." **NeurReps Workshop, (NeurIPS 2022)**. *(selected for **Oral presentation**)*

Aditya Bhaskara, **Sharvaree Vadgama**, and Hong Xu.(2019) "Greedy sampling for approximate clustering in the presence of outliers", **NeurIPS 2019**. *(alphabetical ordering of authors)*

Peer-reviewing

- Served as a reviewer for the main track of conference: ICML (2024, 2025), ICLR (2025), NeurIPS (2024, 2025), AISTATS (2025, 2026), ECCV (2024), and GSI(2023).

- Served as a reviewer for workshops: NeurReps Workshop *[NeurIPS]* (2022-2024), GRaM Workshop *[ICML]* (2024), WiML (2019, 2021).

- Served as Area Chair and Program Chair at *GRaM Workshop, ICML 2024*.