

dr. ir. Erik J. Bekkers

Associate Professor at the Amsterdam Machine Learning Lab (AMLab), University of Amsterdam

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PRINCIPAL INTERESTS

Making AI systems capable of reliably handling real-world physical phenomena: [Geometry-grounded representation learning](#), geometric deep learning, symmetry preserving (equivariant) neural networks, generative modeling, manifold learning, with applications in medical imaging and computational chemistry.

ACADEMIC BACKGROUND

Associate Professor

2024 - Present

Assistant Professor

2019 - 2024

[University of Amsterdam](#), [AMLab](#), Amsterdam, Netherlands

- [Supervising 9 Ph.D. students](#) and 1 post-doc on geometric deep learning methods (equivariant architectures, representation learning, uncertainty quantification) and applications in medical image analysis and computational chemistry.
- Geometry-ground representation learning ([NWO veni](#) and [vidi](#) grant)
- Teaching in the [Master AI](#). Coordinator for [Machine Learning 1](#), the [Deep Learning 2](#) module on [Group Equivariant Deep Learning](#), Introduction ML (Leren) in the BSc AI and a brush-up course ML for Medical Informatics.
- Chair of the board of examiners B.Sc. and M.Sc. Artificial Intelligence.

Post-doc

2016 - 2019

[Eindhoven University of Technology](#), [Applied Differential Geometry](#), Eindhoven, NL

- Co-supervising PhD students in the ERC-StG "Lie Analysis" project of dr.ir. Remco Duits at the dept. of Applied Mathematics and Computer Science.
- Research in ML and image analysis algorithms for medical images using geometric mathematical techniques. Special focus on the analysis, tracking and segmentation of curvilinear structures (lines, vessels, neurons) in 2D and 3D.
- Teaching graduate and undergraduate level Applied Mathematics and Computer Science such as Linear Algebra, PDEs, Mathematical Image Analysis.
- Secretary for the department council for the department of Mathematics and Computer Science.

Ph.D. (Cum-Laude) Medical Image Analysis - Biomedical Engineering 2013 - 2017

[Eindhoven University of Technology](#), Eindhoven, the Netherlands

- Ph.D. research in brain-inspired algorithm development based on the differential geometry of Lie groups, under direction of [dr.ir. Remco Duits](#) and [prof. dr. em. Bart ter Haar Romeny](#). Dissertation title: Retinal Image Analysis using Sub-Riemannian Geometry in SE(2).
- This was an industrial Ph.D. with [i-Optics \(EasyScan BV\)](#).

M.Sc. Biomedical Engineering

2010 - 2012

[Eindhoven University of Technology](#), Eindhoven, the Netherlands

- Focus areas: medical image analysis and physics of imaging. Thesis (vessel tracking in orientation scores) with [University Eye Clinic Maastricht](#). Internships at [Osaka University, Japan](#) (5 months) and at [Philips Research](#) (3 months).

AWARDS AND RECOGNITION

- 2025 - *NWO vidi grant*, 850k personal grant by the Dutch Research Council
- 2023 - *ELLIS Scholar* within the Geometric Deep Learning program
- 2022 - University of Amsterdam *Lecturer of the Year*, Faculty of Science
- 2019 - *NWO veni grant*, 250k personal grant by the Dutch Research Council
- 2018 - *Young Scientist Award* awarded by the Medical Image Computing and Computer Assisted Interventions (MICCAI) society.
- 2018 - *Philips Impact Award* awarded at the international conference on Medical Imaging with Deep Learning (MIDL).
- 2018 - TU/e university-wide *Best Ph.D. Thesis Nomination*.
- 2017 - *Cum Laude* Ph.D. thesis.

PROFESSIONAL ACTIVITIES *Professional activities and service to the research field*

- 2024 - Organizer of the [ICML'24-GRaM Workshop](#) on Geometry-grounded representation learning and generative modeling.
- 2023 - Organizer of the session on *Neurogeometry meets Geometric Deep Learning* at [Geometric Science of Information 2023](#) together with Remco Duits (TU/e) and Alessandro Sarti (CNRS)
- 2023 - Joined management committee of Horizon Europe Cost Action [Cartan geometry, Lie, Integrable Systems, quantum group Theories for Applications \(CaLISTA\)](#)
- 2022 - Organizer of the international workshop on [Geometric Deep Learning for Medical Image Analysis 2022](#) (GeoMedIA 2022) together with Angelica Avilez-Rivero (Cambridge) and Jelmer Wolterink (Uni Twente)
- 2022 - Organizer and Lecturer at [Tutorial on Geometric Deep Learning in Medical Image Analysis](#) at [MICCAI 2022](#) together with Angelica Avilez-Rivero (Cambridge) and Jelmer Wolterink (Uni Twente)
- 2022 - Organizer of the session on *Geometric Deep Learning* at [Geometric Science of Information 2021](#) together with Gabriel Peyre (CNRS, École Normale Supérieure)
- 2022 - Recorded and released lectures on [Group Equivariant Deep Learning](#). The [Youtube playlist](#) has over 17,000 views.
- 2021 - Became scientific advisor for medical software startup [ELLOGON.AI](#) after acquiring a 60K euro grant through the [ELISE](#) SME funding.
- 2021 - Lecturer at [Danish Summer School on Geometric Deep Learning](#)
- 2021 - Recorded and released lectures on [Machine Learning](#). The [Youtube playlist](#) has over 67,000 views.
- 2020 - Organizer of [ELLIS workshop on Geometric and Relational DL](#) together with Thomas Kipf (Google Brain)
- 2016 - Organizer of 3-day [International Workshop on Geometry, PDE's and Lie Groups in Image Analysis](#) together with Remco Duits (TU/e), Andrea Fuster (TU/e) and Yuri Sachkov (RAS)
- Ongoing - Reviewer and area chair for conferences ICLR, NeurIPS, ICML, MICCAI, and ad-hoc for conferences/workshops like CVPR, NeuIPS-NeurReps, LoG Conference and journals like IEEE tPAMI, TMI, IJCV, JMIV, MedIA, among others.
- Ongoing, [ELLIS member](#) and [faculty of ELLIS unit Amsterdam](#).

- Reviewing applications to the ELLIS PhD program and nominations for ELLIS Scholars/Fellows.

Invited Talks and Keynotes (selection)

- 2024 - Invited talk at the [Structured Learning workshop](#), Gothenburg, Sweden.
- 2024 - Keynote speaker at the [CVPR'24 - Equivision workshop](#), Seattle, US.
- 2023 - Invited talk SIAM CSE Amsterdam, session on [Geometry and Shape Analysis for Neuroscience: Geometric Structures in Neuroscience](#).
- 2023 - Invited talk at [ICCV'23 - VIPriors Workshop: Visual Inductive Priors for Data-Efficient Deep Learning Workshop](#), Paris, FR.
- 2022 - Invited talk at [NeurIPS'22 - Neurereps workshop: Symmetry and Geometry in Neural Representations](#), New Orleans, US
- 2022 - Invited talk at [Workshop on Geometry and ML](#), Heidelberg, DE.
- 2022 - Invited talk at the [Nederlands Mathematisch Congres](#), Utrecht, NL
- 2021 - Keynote at [Computational Mathematics and ML](#), Lorentz Centre, Leiden
- 2020 - Invited talk at LMS-Bath Symposium [Mathematics of ML](#), Bath, UK
- 2019 - Invited talk at [ICCV 2019 4th workshop on Geometry Meets Deep Learning Workshop](#), Seoul, KR

RESEARCH FUNDING

The following research proposals have been granted

- 850K euro (2024) - **as sole applicant** - [NWO vidi](#) (Exact sciences) for project "Neural Ideograms: Shaping AI with Geometry-Grounded Learning"
- 150K euro (2024) - *as co-applicant* - Internal (UvA, FNWI) [Molecular and Material Design \(MMD\)](#) grant. Generative AI for designing novel enzymes. Main PI Aalt-Jan van Dijk (UvA, SILS), co-appl. Francesco Mutti (UvA, HIMS).
- 60K euro (2024) - **as main applicant** - [Simons Foundation Mentorship Grant](#) to host/mentor theoretical physicist [Nabil Iqbal](#)'s pivot towards geometric DL.
- 775K euro (2023) - *as co-applicant* - [KWF Public Private Partnership](#) for the project "Artificial Intelligence based and integrated histopathology image analysis for personalized immunotherapy selection of Gastric and Esophageal cancer patients (SELECT-AI)". Main PI *Sybren Meijer* (AUMC), with *Ellogon AI*.
- 2.5M euro (2023) - *as co-applicant* - Participating with 1 PhD student (out of 11) in a [Horizon Europe Marie Skłodowska-Curie](#) consortium led by *Rita Fioresi* at University of Bologna on "Cartan and differential geometry, Lie theory, quantum groups and non commutative geometry For novel and Innovative Applications to quantum algorithms and geometric deep learning"
- 40K euro (2023) - *as co-applicant* - [Responsible Digital Transformations Seed Grant](#) funded by the UvA for "Synthetic data for responsible digital transformation to reduce animal testing and enhance new medical treatment uptake: an application in acute ischemic stroke". Main PI *Praneeta Konduri* (AUMC).
- 250K euro (2021) - *as co-applicant* - [MLDS "Right on Time"](#) Research fund by the Maag Lever Darm Stichting for "Artificial Intelligence based Detection and progression-prediction of Esophageal Adenocarcinoma precursor Lesions (IDEAL)". Main PI *Sybren Meijer* (AUMC).
- 250K euro (2019) - **as sole applicant** - [NWO veni](#) (Applied engineering sciences) for "Context-Aware Artificial Intelligence in Medical Image Analysis"

TEACHING (at UvA)

- University of Amsterdam *Lecturer of the Year* Faculty of Science 2022
- Received University Teaching Qualification (BKO) in 2022
- Courses:
 - *Machine Learning 1, M.Sc. AI* 2020-present
 - *Deep Learning 2: Equivariant Deep Learning, M.Sc. AI* 2022-present
 - *Brush-up Machine Learning, M.Sc. Medical Informatics* 2022-2023
 - *Introduction to Machine Learning (Leren), B.Sc. A.I.* 2023
- Examined 50+ M.Sc. thesis projects
- Supervised 25 M.Sc. students

PhD ALUMNI

- David W. Romero (2024, [Cum Laude](#)): *The Good, The Efficient and The Inductive Biases*. Copromotores: Dr. J.M. Tomczak, Dr. Ir. E.J. Bekkers. Promotor: Prof. Dr. M. Hoogendoorn
- Artem Moskalev (2024): *Representation Learning with Structured Invariance*. Copromotor: Dr. Ir. E.J. Bekkers. Promotor: Prof. Dr. Ir. A.W.M. Smeulders

CONFERENCE PUBLICATIONS

See also my [Google Scholar](#) page for an up-to-date overview.

- [1] Draganov, Andrew, S. Vadgama, S. Damrich, J. N. Böhm, L. Maes, D. Kobak, and E. J. **Bekkers**. “On the Importance of Embedding Norms in Self-Supervised Learning”. In: *Forty-second International Conference on Machine Learning*. 2025.
- [2] Eijkelboom, Floor, H. Zimmerman, S. Vadgama, E. J. **Bekkers**, M. Welling, and C. A. Naesseth. “Controlled Generation with Equivariant Variational Flow Matching”. In: *Forty-second International Conference on Machine Learning*. 2025.
- [3] A. García-Castellanos, A. A. Medbouhi, G. L. Marchetti, E. J. **Bekkers**, and D. Kragic. “Hypersteiner: Computing heuristic hyperbolic steiner minimal trees”. In: *2025 Proceedings of the Symposium on Algorithm Engineering and Experiments (ALENEX)*. SIAM, 2025, pp. 194–208.
- [4] T. P. Kuipers, P. R. Konduri, E. J. **Bekkers**, and H. Marquering. “Self-Supervised Synthetic Cerebral Vessel Tree Generation using Semantic Signed Distance Fields”. In: *Medical Imaging with Deep Learning*. 2025.
- [5] van der Linden, Putri A, A. Timans, and E. J. **Bekkers**. “CP2: Leveraging Geometry for Conformal Prediction via Canonicalization”. In: *The 41st Conference on Uncertainty in Artificial Intelligence*. 2025.
- [6] D. Wessels, D. M. Knigge, R. Valperga, S. Papa, S. Vadgama, E. Gavves, and E. J. **Bekkers**. “Grounding Continuous Representations in Geometry: Equivariant Neural Fields”. In: *The Thirteenth International Conference on Learning Representations*. 2025.
- [7] E. J. **Bekkers**, S. Vadgama, R. Hesselink, P. A. V. d. Linden, and D. W. Romero. “Fast, Expressive SE(n) Equivariant Networks through Weight-Sharing in Position-Oriented Space”. In: *The Twelfth International Conference on Learning Representations*. 2024.
- [8] M. M. Islam, C. d. Vente, B. Liefers, C. Klaver, E. J. **Bekkers**, and C. I. Sánchez. “Uncertainty-aware retinal layer segmentation in OCT through probabilistic signed distance functions”. In: *Medical Imaging with Deep Learning*. 2024.
- [9] D. M. Knigge, D. R. Wessels, R. Valperga, S. Papa, J.-J. Sonke, E. Gavves, and E. J. **Bekkers**. “Space-Time Continuous PDE Forecasting using Equivariant Neural Fields”. In: *Advances in Neural Information Processing Systems*. 2024.
- [10] T. P. Kuipers, P. R. Konduri, H. Marquering, and E. J. **Bekkers**. “Generating Cerebral Vessel Trees of Acute Ischemic Stroke Patients using Conditional Set-Diffusion”. In: *Medical Imaging with Deep Learning*. 2024.
- [11] P. van der Linden, A. García Castellanos, S. Vadgama, T. P. Kuipers, and E. J. **Bekkers**. “Learning symmetries via weight-sharing with doubly stochastic tensors”. In: *The Thirty-eighth Annual Conference on Neural Information Processing Systems*. 2024.
- [12] F. Eijkelboom, R. Hesselink, and E. J. **Bekkers**. “E(n) Equivariant Message Passing Simplicial Networks”. In: *International Conference on Machine Learning*. PMLR, 2023, pp. 9071–9081.
- [13] D. M. Knigge, D. W. Romero, A. Gu, E. Gavves, E. J. **Bekkers**, J. M. Tomczak, M. Hoogendoorn, and J.-j. Sonke. “Modelling Long Range Dependencies in ND: From Task-Specific to a General Purpose CNN”. In: *International Conference on Learning Representations*. Feb. 2023.
- [14] M. M. Kofinas, E. J. **Bekkers**, N. Nagaraja, and E. Gavves. “Latent field discovery in interacting dynamical systems with neural fields”. In: *Advances in Neural Information Processing Systems*. Vol. 36. 2023.
- [15] T. P. Kuipers and E. J. **Bekkers**. “Regular SE(3) Group Convolutions for Volumetric Medical Image Analysis”. In: *Medical Image Computing and Computer Assisted Intervention – MICCAI 2023*. Ed. by H. Greenspan, A. Madabhushi, P. Mousavi, S. Salcudean, J. Duncan, T. Syeda-Mahmood, and R. Taylor. Cham: Springer Nature Switzerland, 2023, pp. 252–261.

- [16] S. Vadgama, J. M. Tomczak, and E. J. **Bekkers**. “Continuous Kendall Shape Variational Autoencoders”. In: *Geometric Science of Information*. Ed. by F. Nielsen and F. Barbaresco. Cham: Springer Nature Switzerland, 2023, pp. 73–81.
- [17] J. Brandstetter, R. Hesselink, E. Pol van der, E. J. **Bekkers**, and M. Welling. “Geometric and Physical Quantities improve E(3) Equivariant Message Passing”. In: *International Conference on Learning Representations*. 2022.
- [18] D. M. Knigge, D. W. Romero, and E. J. **Bekkers**. “Exploiting redundancy: Separable group convolutional networks on lie groups”. In: *International Conference on Machine Learning*. PMLR, 2022, pp. 11359–11386.
- [19] D. W. Romero, R.-J. Brintjes, J. M. Tomczak, E. J. **Bekkers**, M. Hoogendoorn, and J. v. Gemert. “FlexConv: Continuous Kernel Convolutions With Differentiable Kernel Sizes”. In: *International Conference on Learning Representations*. 2022.
- [20] D. W. Romero, A. Kuzina, E. J. **Bekkers**, J. M. Tomczak, and M. Hoogendoorn. “CKConv: Continuous Kernel Convolution For Sequential Data”. In: *International Conference on Learning Representations*. 2022.
- [21] R. Duits, B. M. N. Smets, E. J. **Bekkers**, and J. Portegies. “Equivariant Deep Learning via Morphological and Linear Scale Space PDEs on the Space of Positions and Orientations.” In: *International Conference on Scale Space and Variational Methods in Computer Vision*. 2021, pp. 27–39.
- [22] D. Romero, E. J. **Bekkers**, J. Tomczak, and M. Hoogendoorn. “Attentive group equivariant convolutional networks”. In: *International Conference on Machine Learning*. PMLR, 2020, pp. 8188–8199.
- [23] E. J. **Bekkers**. “B-Spline CNNs on Lie groups”. In: *International Conference on Learning Representations*. 2019.
- [24] F. Huang, S. Abbasi-Sureshjani, J. Zhang, E. J. **Bekkers**, B. Dashtbozorg, and B. M. ter Haar Romeny. “Vascular biomarkers for diabetes and diabetic retinopathy screening”. In: *Computational Retinal Image Analysis*. Elsevier, 2019, pp. 319–352.
- [25] E. J. **Bekkers**, M. W. Lafarge, M. Veta, K. A. J. Eppenhof, J. P. W. Pluim, and R. Duits. “Roto-Translation Covariant Convolutional Networks for Medical Image Analysis”. In: *Medical Image Computing and Computer Assisted Intervention – MICCAI 2018*. Ed. by A. F. Frangi, J. A. Schnabel, C. Davatzikos, C. Alberola-López, and G. Fichtinger. Cham: Springer International Publishing, 2018, pp. 440–448.
- [26] E. J. **Bekkers**, R. Duits, A. P. Mashtakov, and Y. L. Sachkov. “Vessel Tracking via Sub-Riemannian Geodesics on the Projective Line Bundle”. In: *International Conference on Geometric Science of Information*. Springer, 2017, pp. 773–781.
- [27] M. H. J. Janssen, T. C. J. Dela Haije, F. C. Martin, E. J. **Bekkers**, and R. Duits. “The Hessian of axially symmetric functions on SE (3) and application in 3D image analysis”. In: *International Conference on Scale Space and Variational Methods in Computer Vision*. Springer, 2017, pp. 643–655.
- [28] A. P. Mashtakov, R. Duits, Y. L. Sachkov, E. J. **Bekkers**, and I. Beschastnyi. “Sub-Riemannian geodesics in SO (3) with application to vessel tracking in spherical images of retina”. In: *Doklady Mathematics*. Vol. 95. Springer, 2017, pp. 168–171.
- [29] S. Abbasi-Sureshjani, I. Smit-Ockeloen, E. J. **Bekkers**, B. Dashtbozorg, and B. M. ter Haar Romeny. “Automatic detection of vascular bifurcations and crossings in retinal images using orientation scores”. In: *Biomedical Imaging (ISBI), 2016 IEEE 13th International Symposium on*. IEEE, 2016, pp. 189–192.
- [30] E. J. **Bekkers**, R. Duits, and M. Loog. “Training of Templates for Object Recognition in Invertible Orientation Scores: Application to Optic Nerve Head Detection in Retinal Images”. English. In: *Energy Minimization Methods in Computer Vision and Pattern Recognition*. Ed. by X.-C. Tai, E. Bae, T. Chan, and M. Lysaker. Vol. 8932. Lecture Notes in Computer Science. Springer International Publishing, 2015, pp. 464–477.
- [31] E. J. **Bekkers**, R. Duits, A. P. Mashtakov, and G. R. Sanguinetti. “Data-Driven Sub-Riemannian Geodesics”. English. In: *International Conference on Scale Space and Variational Methods in Computer Vision*. Ed. by J.-F. Aujol, M. Nikolova, and N. Papakadis. Lecture Notes in Computer Science. Springer, 2015, pp. 613–625.

- [32] G. R. Sanguinetti, E. J. **Bekkers**, R. Duits, M. H. J. Janssen, A. P. Mashtakov, and J.-M. Mirebeau. “**Sub-Riemannian Fast Marching in SE(2)**”. In: *Progress in Pattern Recognition, Image Analysis, Computer Vision, and Applications*. Springer International Publishing, 2015, pp. 366–374.
- [33] J. Zhang, E. J. **Bekkers**, S. Abbasi-Sureshjani, B. Dashtbozorg, and B. M. ter Haar Romeny. “**Robust and Fast Vessel Segmentation via Gaussian Derivatives in Orientation Scores**”. English. In: *International Conference on Image Analysis and Processing 2015*. Ed. by G. Vernazza, E. Puppo, and V. Murino. Lecture Notes in Computer Science. 2015, pp. 537–547.
- [34] E. J. **Bekkers**, R. Duits, and B. M. ter Haar Romeny. “**Optic Nerve Head Detection via Group Correlations in Multi-orientation Transforms**”. English. In: *Image Analysis and Recognition*. Ed. by A. Campilho and M. Kamel. LNCS. Springer, 2014, pp. 293–302.
- [35] J. Hannink, R. Duits, and E. J. **Bekkers**. “**Crossing-Preserving Multi-scale Vesselness**”. English. In: *Medical Image Computing and Computer-Assisted Intervention – MICCAI 2014*. Ed. by P. Golland, N. Hata, C. Barillot, J. Hornegger, and R. Howe. Vol. 8674. Lecture Notes in Computer Science. Springer International Publishing, 2014, pp. 603–610.

WORKSHOP PUBLICATIONS

- [36] G. Bernárdez, L. Telyatnikov, M. Montagna, F. Baccini, M. Papillon, M. Ferriol-Galmés, M. Hajij, T. Papamarkou, M. S. Bucarelli, O. Zaghen, et al. “**ICML Topological Deep Learning Challenge 2024: Beyond the Graph Domain**”. In: *ICML 2024 Workshop on Geometry-grounded Representation Learning and Generative Modeling*. 2024.
- [37] V. Kovac, E. J. **Bekkers**, P. Lio, and F. Eijkelboom. “**E(n) Equivariant Message Passing Cellular Networks**”. In: *ICML 2024 Workshop on Geometry-grounded Representation Learning and Generative Modeling*. 2024.
- [38] V. Prins, W. Diepeveen, E. J. **Bekkers**, and O. Öktem. “**Physics-informed geometric regularization of heterogeneous reconstructions in cryo-EM**”. In: *ICLR 2024 Workshop on Generative and Experimental Perspectives for Biomolecular Design*. 2024.
- [39] O. Ranum, D. Wessels, G. Otterspeer, E. J. **Bekkers**, F. Roelofsen, and J. I. Andersen. “**The NGT200 Dataset - Geometric Multi-View Isolated Sign Recognition**”. In: *ICML 2024 Workshop on Geometry-grounded Representation Learning and Generative Modeling*. 2024.
- [40] R. A. Cosma, L. Knobel, P. van der Linden, D. M. Knigge, and E. J. **Bekkers**. “**Geometric Superpixel Representations for Efficient Image Classification with Graph Neural Networks**”. In: *Proceedings of the IEEE/CVF International Conference on Computer Vision*. 2023, pp. 109–118.
- [41] F. Eijkelboom, E. J. **Bekkers**, M. Bronstein, and F. Di Giovanni. “**Can strong structural encoding reduce the importance of Message Passing?**” In: *Proceedings of 2nd Annual Workshop on Topology, Algebra, and Geometry in Machine Learning (TAG-ML)*. Vol. 221. PMLR, 2023, pp. 278–288.
- [42] Y. Koishekenov and E. J. **Bekkers**. “**An Exploration of Conditioning Methods in Graph Neural Networks**”. In: *ICLR 2023 - Machine Learning for Drug Discovery workshop*. 2023.
- [43] Y. Koishekenov, S. Vadgama, R. Valperga, and E. J. **Bekkers**. “**Geometric Contrastive Learning**”. In: *4th Visual Inductive Priors for Data-Efficient Deep Learning Workshop*. 2023.
- [44] P. A. Linden van der, D. W. Romero, and E. J. **Bekkers**. “**Learned Gridification for Efficient Point Cloud Processing**”. In: *Proceedings of 2nd Annual Workshop on Topology, Algebra, and Geometry in Machine Learning (TAG-ML)*. Vol. 221. PMLR, 2023, pp. 9–20.
- [45] A. Moskaev, A. Sepiarskaia, E. J. **Bekkers**, and A. Smeulders. “**On genuine invariance learning without weight-tying**”. In: *Proceedings of 2nd Annual Workshop on Topology, Algebra, and Geometry in Machine Learning (TAG-ML)*. Vol. 221. PMLR, 2023, pp. 218–227.

- [46] C. A. Shewmake, D. Buracas, H. Lillemark, J. Shin, E. J. **Bekkers**, N. Miolane, and B. Olshausen. “Visual Scene Representation with Hierarchical Equivariant Sparse Coding”. In: *NeurIPS 2023 Workshop on Symmetry and Geometry in Neural Representations*. 2023.
- [47] V. van Veldhuizen, S. Vadgama, O. de Boer, S. Meijer, and E. J. **Bekkers**. “Modeling Barrett’s Esophagus Progression Using Geometric Variational Autoencoders”. In: *Cancer Prevention Through Early Detection*. Ed. by S. Ali, F. van der Sommen, M. van Eijnatten, B. W. Papiez, Y. Jin, and I. Kolenbrander. Cham: Springer Nature Switzerland, 2023, pp. 132–142.
- [48] R. Liu, F. Lauze, E. J. **Bekkers**, K. Erleben, and S. Darkner. “Group convolutional neural networks for DWI segmentation”. In: *Geometric Deep Learning in Medical Image Analysis*. PMLR, 2022, pp. 96–106.
- [49] S. Vadgama, J. M. Tomczak, and E. J. **Bekkers**. “Kendall Shape-VAE: Learning Shapes in a Generative Framework”. In: *NeurIPS 2022 Workshop on Symmetry and Geometry in Neural Representations*. 2022.
- [50] E. St Onge, S. Meesters, E. J. **Bekkers**, M. Descoteaux, and R. Duits. “HARDI denoising with mean-curvature enhancement PDE on SE(3)”. In: *ISMRM Proceedings, Montreal*. 2019, pp. 1–3.
- [51] B. Dashtbozorg, S. Abbasi-Sureshjani, J. Zhang, F. Huang, E. J. **Bekkers**, and B. M. ter Haar Romeny. “Infrastructure for Retinal Image Analysis”. English. In: *Proceedings of the Ophthalmic Medical Image Analysis Third International Workshop, OMIA 2016, Held in Conjunction with MICCAI 2016, Athens, Greece, October 21, 2015*. Ed. by E. Trucco, X. Chen, M. Garvin, J. Liu, and X. Frank. Iowa Research Online, 2016, pp. 1–8.
- [52] J. Zhang, E. J. **Bekkers**, S. Abbasi-Sureshjani, B. Dashtbozorg, and B. ter Haar Romeny. “Bridging Disconnected Curvilinear Structures via Numerical Evolutions of Completion Process in Ophthalmologic Images”. In: *Proceedings of the Ophthalmic Medical Image Analysis International Workshop*. Vol. 3. Issue: 2016. University of Iowa, 2016.
- [53] E. J. **Bekkers**, J. Zhang, R. Duits, and B. M. ter Haar Romeny. “Curvature Based Biomarkers for Diabetic Retinopathy via Exponential Curve Fits in SE(2)”. English. In: *Proceedings of the Ophthalmic Medical Image Analysis Second International Workshop, OMIA 2015, Held in Conjunction with MICCAI 2015, Munchen, Germany, October 9, 2015*. Ed. by E. Trucco, X. Chen, M. Garvin, J. Liu, and X. Frank. Iowa Research Online, 2015, pp. 113–120.
- [54] K. A. J. Eppenhof, E. J. **Bekkers**, T. T. J. M. Berendschot, J. P. W. Pluim, and B. M. ter Haar Romeny. “Retinal Artery/Vein Classification via Graph Cut Optimization”. English. In: *Proceedings of the Ophthalmic Medical Image Analysis Second International Workshop, OMIA 2015, Held in Conjunction with MICCAI 2015, Munchen, Germany, October 9, 2015*. Ed. by E. Trucco, X. Chen, M. Garvin, J. Liu, and X. Frank. Iowa Research Online, 2015, pp. 121–128.
- [55] F. Huang, J. Zhang, E. J. **Bekkers**, B. Dashtbozorg, and B. M. ter Haar Romeny. “Stability Analysis of Fractal Dimension in Retinal Vasculature”. English. In: *Proceedings of the Ophthalmic Medical Image Analysis Second International Workshop, OMIA 2015, Held in Conjunction with MICCAI 2015, Munchen, Germany, October 9, 2015*. Ed. by E. Trucco, X. Chen, M. Garvin, J. Liu, and X. Frank. Iowa Research Online, 2015, pp. 1–8.

EXTENDED ABSTRACTS

- [56] C. Liu, S. Vadgama, D. Ruhe, E. J. **Bekkers**, and P. Forré. “Clifford Group Equivariant Diffusion Models For 3D Molecular Generation”. In: *Frontiers in Probabilistic Inference: Learning meets Sampling*. 2025.
- [57] O. Zaghen, F. Eijkelboom, A. Pouplin, and E. J. **Bekkers**. “Towards Variational Flow Matching on General Geometries”. In: *ICLR 2025 Workshop on Deep Generative Model in Machine Learning: Theory, Principle and Efficacy*. 2025.

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