LIST OF PUBLICATIONS

(In computational geometry and mathematics, authors are in the alphabetic order.)

Computational Geometry

- Michael G. Dobbins, Heuna Kim, Luis Montejano, and Edgardo Roldán-Pensado. **Shadows of a Closed Curve**, International Mathematics Research Notices, 2020, Oxford University Press, Vol. 2020, Issue 7, pp. 1992–2006.

  Topological methods (Poincaré Duality) was used to show impossibility of embedding a closed curve in any d-dimension with restrictions in its orthogonal projections.

- Heuna Kim, Günter Rote. **Congruence Testing for Point Sets in 4-space,** 32nd International Symposium on Computational Geometry (SoCG 2016), International Proceedings in Informatics (LIPIcs), Schloss Dagstuhl–Leibniz–Zentrum für Informatik, 2016, Vol. 51, pp. 48:1–48:16.

  Coxeter Classification, Grassmannian, Plücker embedding, and Hopf fibrations are used to develop a 4-dimensional optimal congruence-testing algorithm. This result contributes to one of the long-standing open problems in computational geometry.

- Prosenjit Bose, Jean-Lou De Carufel, Michael G. Dobbins, Heuna Kim, and Giovanni Viglietta. **The Shadows of a Cycle Cannot All Be Paths,** Proceedings of the 27th Canadian Conference on Computational Geometry (CCCG'15), 2015, pp. 70–75.

  A 3-dimensional geometric problem about a closed curve and its orthogonal projections was solved.

- Heuna Kim, Wolfgang Mulzer, and Eunjin Oh. **The Number of Combinatorially Different Convex Hulls of Points in Lines,** Proceedings of the 31st European Workshop on Computational Geometry (EWCG), 2015, pp. 161–164.

  The trapezoidal zone theorem for a line arrangement is extended by a bit-encoding technique. This is used to show asymptotic tight bounds of a geometric optimization problem on imprecise data.

- Heuna Kim, Till Miltzow. **Packing Segments in a Simple Polygon is APX-hard,** Proceedings of the 31st European Workshop on Computational Geometry (EWCG), 2015, pp. 24–27.

  A collection of complexity results (NP-hard, APX-hard, and an approximation algorithm) related to one of the fundamental maximum-packing problems is presented.

- Michael Gene Dobbins and Heuna Kim. **Packing Segments in a Convex 3-Polytope is NP-hard,** Proceedings of the 30th European Workshop on Computational Geometry (EWCG), 2014.

  A construction of generic planes in a 3-dimensional space is used to show NP-hardness of one of the important maximum-packing problems.

- Otfried Cheong, Sariel Har-Peled, Heuna Kim, and Hyo-Sil Kim. **On the Number of Edges of a Fan-crossing Free Graph**, Algorithmica, Springer-Verlag, 2015, Vol. 73, No. 4, pp. 673–695. (On invitation, special issue on ISAAC 2013.)

  Combinatorial arguments are used to give the tight bound for a graph-embedding problem.

- Otfried Cheong, Sariel Har-Peled, Heuna Kim, and Hyo-Sil Kim. **On the Number of Edges of a Fan-crossing Free Graph**, Proceedings of the 24th International Symposium on Algorithms and Computation (ISAAC), LNCS 8283, Springer-Verlag, 2013, pp. 163–173.

  This is an original conference version of the journal article directly above.

Machine Learning and Deep Learning

- Raghav Goyal, Samira Ebrahimi Kahou, Vincent Michalski, Joanna Materzynska, Susanne Westphal, Heuna Kim, Valentin Haenel, Ingo Fruend, Peter Yianilos, Moritz Mueller-Freitag, Florian Hoppe, Christian Thurau, Ingo Box, and Roland Memisevic. **The "Something Something" Video Database for Learning and Evaluating Visual Common Sense**, 2017 IEEE International Conference on Computer Vision (ICCV), IEEE, 2017, pp. 5843–5851.

  To capture the common sense in video data, an open video data set for deep learning was created and multiple models combining RNN and CNN were applied to analyze the dataset.

- Hyejin Park, Heun A Kim, Seung-ho Yang, and Jaewook Lee. **Transductive Bayesian Regression via Manifold Learning of Prior Data Structure**, Expert Systems with Applications, Pergamon Press, 2012, Vol.39, No.16, pp.12557–12563.

  The transductive process for a dimension reduction method called Local Tangent Space Alignment (LTSA) was developed for a robust regression in large-scale data.

TALKS

(Some slides of talks are available on GitHub: `https://github.com/hahey`*.)*

Invited Talks

- Seminar with AI Experts, Department of AI, Sungkyunkwan University, scheduled in July 2021
- Alumni Invitation Seminar: Jeju Science High School for Gifted Students, August 2019

Publication Presentation at Conferences, Competitions and Colloquiums

– Korean Power Exchange (KPX) Wind Power Forecasting Competition 2019
– the 32nd International Symposium on Computational Geometry (SoCG 2016)
– the 31st European Workshop on Computational Geometry (EuroCG 2015)
– the 30th European Workshop on Computational Geometry (EuroCG 2014)
– Kolloquium über Kombinatorik (KolKom) 2014
– the 24th International Symposium on Algorithm and Computation (ISAAC 2013)

Publically Organized Technical Seminars

Monthly Berlin Machine Learning (BML) Seminar (Advanced Machine Learning Seminar)
  – Examples of Reinforcement Learning Applications in the Financial Market, October 2020
Advanced Machine Learning Jounal Club at Korean Developers in Germany
  – Supporting Organizer, since May 2020
  – Talk: Continuum-armed Bandit, March 2021
  – Talk: Understanding KKT conditions and beta variational autoencoder, scheduled in July 2021
Monthly Renewable Energy Study Group and Solarpunks
  – Supporting Organizer, July 2020 $\sim$ November 2020
  – Talk: Summary of Open Research for Solar Power Forecasting, August 2020
Monthly PyBerlin Meetup
  – Lighting Talk for supporting and finding ReDI School voluteers, October 2019

Internally Organized Technical Seminars

Weekly Internal Technical Seminars at the following companies:

- Pupil Labs GmbH., Haezoom Europe GmbH., Twenty Billion Neurons GmbH.

Employee Python Training Sessions at Haezoom Europe GmbH.:

- trained other employees weekly for 10 sessions (1.5 hours per session)
- Topics: Twicking with pandas, Generators and Iterators, Decorators, How to use Context manager, a Practical Example of Coroutine, Ensemble methods with scikit-learn and more.

Weekly Seminars at Freie Universität Berlin :

- Presented 9 times (1 hour per seminar) at Arbeitsgruppe Theoretische Informatik (AGTI)

Biannual Kolloquium for Evaluation for the PhD Scholarship Program:

- Methods for Discrete Structures (MDS) Kolloquiums and Status Workshop 2015, 2016

Technical Seminars as a Visiting Researcher at the following universities:

- Laboratoire d'Informatique Gaspard-Monge (LIGM), Université Paris-Est Marne-la-Vallée (UPEM), 2015 May
- Instituto de Matemáticas, Universidad Nacional Autónoma de México (UNAM), April 2015
- Working Group Algorithms and Data Structures, Universität Bayreuth, April 2015
- Team VEGAS, National Institute of Research in Computer Science and Control(INRIA) Nancy, April 2013
- Working Group Theory of Combinatorial Algorithms, Swiss Federal Institute of Technology in Zurich (ETH Zürich), March 2013