Please see the webpage for the details: https://heuna-kim.net

LIST OF PUBLICATIONS

Computational Geometry

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

Michael G. Dobbins, Heuna Kim, Luis Montejano, and Edgardo Roldán-Pensado. **Shadows of a Closed Curve**, International Mathematics Research Notices, pp. 1073-7928, 2018.

- 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).

- 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,** In Proceedings of the 27th Canadian Conference on Computational Geometry (CCCG'15), pp. 70-75, 2015

- 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,** In Abstracts of the 31st European Workshop on Computational Geometry (EuroCG), 2015.

- 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. This result is related to imprecise data.

Heuna Kim, Till Miltzow. **Packing Segments in a Simple Polygon is APX-hard,** In Abstracts of the 31st European Workshop on Computational Geometry (EuroCG), 2015.

- 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,** In Abstracts of the 30th European Workshop on Computational Geometry (EuroCG), 2014.

- A construction of generic planes in a 3-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, 73 (2015) 673–695. (On invitation, special issue on ISAAC 2013.)

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

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

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**, International Conference of Computer Vision (ICCV), Vol. 1, No.2, p.3, 2017.

- To capture the common sense in video data, an open video data set for deep learning was created and multiple combinations of RNN and CNN models 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, Vol.39, No.16, pp.12557-12563, 2012

- 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

Conferences, Competitions, Colloquiums and Workshops

- Berlin Machine Learning (BML) Seminar (Advanced Machine Learning) October 2020
- Korean Power Exchange (KPX) Wind Power Forecasting Competition 2019
- the 32nd International Symposium on Computational Geometry (SoCG 2016)
- Methods for Discrete Structures (MDS) Kolloquiums 2015, 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)

Internal Technical Seminars

Companies: Haezoom Europe GmbH., Twenty Billion Neurons GmbH.
Alumni Invitation: Jeju Science High School
Universities:

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