

O-joung Kwon

Assistant Professor at Department of Mathematics, Incheon National University, Incheon, South Korea
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Ph.D Advisor : Sang-il Oum (<http://mathsci.kaist.ac.kr/~sangil>)

RESEARCH INTERESTS

Graph theory, Combinatorial Optimization, Structural Graph Theory, Parameterized Complexity.

PREVIOUS POSITIONS

Researcher (Postdoc), Institut für Softwaretechnik und Theoretische Informatik, Technische Universität Berlin, Berlin, Germany

Advisor: Stephan Kreutzer

Jul, 2016 ~ Feb, 2018

Joined in ERC consolidator grant DISTRUCT : Structure Theory for Directed Graphs

Researcher (Postdoc), Institute for Computer Science and Control (MTA SZTAKI), Hungarian Academy of Sciences, Budapest, Hungary

Advisor: Dániel Marx

Jul, 2015 ~ Jun, 2016

Joined in ERC Project PARAMTIGHT : Parameterized complexity and the search for tight complexity results

EDUCATION

Ph.D. Department of Mathematical Sciences

Sep, 2012 ~ Aug, 2015

KAIST, Daejeon, South Korea

Advisor: Sang-il Oum

Thesis title: Structural and algorithmic properties of linear rank-width

M.S. Department of Mathematical Sciences

Sep, 2010 ~ Aug, 2012

KAIST, Daejeon, South Korea

Thesis title: Connecting rank-width and tree-width via pivot-minors

B.S. Department of Mathematics

Mar, 2003 ~ Aug, 2010

Hanyang University, Seoul, South Korea

(including 2 years for military service)

JOURNAL PAPERS

22) An optimal XP algorithm for Hamiltonian cycle on graphs of bounded clique-width

Benjamin Bergougnoux, Mamadou Kanté, and **O-joung Kwon**

[Algorithmica](#). 82(6) (June, 2020), pp 1654-1674, WADS 2017, [arXiv:1702.06095](#)

21) Mim-width I. Induced path problems

Lars Jaffke, **O-joung Kwon**, and Jan Arne Telle

[Discrete Applied mathematics](#) 278 (15 May, 2020), pp 153-168, IPEC 2017, [arXiv:1708.04536](#)

20) Scattered classes of graphs

O-joung Kwon and Sang-il Oum

[SIAM Journal on Discrete Mathematics](#) 34(1) (Mar, 2020), pp 972-999, [arXiv:1801.06004](#)

19) Mim-width II. The feedback vertex set problem

Lars Jaffke, **O-joung Kwon**, and Jan Arne Telle

[Algorithmica](#). 82(1). (Jan, 2020), pp 118-145, STACS 2018, [arXiv:1710.07148](#)

- 18) On low rank-width colorings
O-joong Kwon, Michal Pilipczuk, and Sebastian Siebertz
[European Journal of Combinatorics. 83. \(Jan, 2020\), 103002, WG 2017, arXiv:1703.03304](#)
- 17) Classes of graphs with no long cycle as a vertex-minor are polynomially chi-bounded
Ringi Kim, **O-joong Kwon**, Sang-il Oum, and Vaidy Sivaraman
[Journal of Combinatorial Theory Ser. B. 140 \(Jan, 2020\), pp 372-386, arXiv:1809.04278](#)
- 16) Mim-Width III. Graph Powers and Generalized Distance Domination Problems
Lars Jaffke, **O-joong Kwon**, Torstein Stromme, and Jan Arne Telle
[Theoretical Computer Sciences. 796 \(Dec, 2019\), pp 216-236, IPEC 2018, arXiv:1803.03514](#)
- 15) Generalized feedback vertex set problems on bounded-treewidth graphs: chordality is the key to single-exponential parameterized algorithms
Édouard Bonnet, Nick Brettell, **O-joong Kwon**, and Dániel Marx
[Algorithmica. 81\(10\). \(Oct. 2019\), pp 3890-3935, IPEC 2017, arXiv:1704.06757](#)
- 14) Chi-boundedness of graph classes excluding wheel vertex-minors
Hojin choi, **O-joong Kwon**, Sang-il Oum, and Paul Wollan
[Journal of Combinatorial Theory Ser. B. 135 \(Mar. 2019\), pp 319-348, arXiv:1702.07851](#)
- 13) Linear rank-width of distance-hereditary graphs II. Vertex-minor obstructions.
Mamadou Moustapha Kanté and **O-joong Kwon**.
[European Journal of Combinatorics. 74 \(Dec. 2018\), pp 110-139, arXiv:1508.04718](#)
- 12) A single-exponential fixed-parameter algorithm for Distance-Hereditary Vertex Deletion
Eduard Eiben, Robert Ganian, and **O-joong Kwon**.
[J. of Computer and System Sciences. 97 \(Nov. 2018\), pp 121-146, MFCS2016, arXiv:1604.06056](#)
- 11) A width parameter useful for chordal and co-comparability graphs
Dong Yeup Kang, **O-joong Kwon**, Torstein Stromme, and Jan Arne Telle
[Theoretical Computer Sci. 704 \(15. Dec. 2017\), pp 1-17, WALCOM2017, arXiv:1606.08087](#)
- 10) Packing and covering immersion models of planar subcubic graphs
Archontia Giannopoulou, **O-joong Kwon**, Jean-Florent Raymond, and Dimitrios M. Thilikos
[European J. Combin. 65 \(Oct. 2017\), pp 154-167, WG2016, arXiv:1602.04042](#)
- 9) A polynomial kernel for Block Graph Deletion
Eun Jung Kim and **O-joong Kwon**
[Algorithmica. \(Sep, 2017\), pp 251-270, IPEC2015, arXiv:1506.08477](#)
- 8) An FPT algorithm and a polynomial kernel for linear rank-width one vertex deletion
Mamadou Kanté, Eun Jung Kim, **O-joong Kwon**, and Christophe Paul
[Algorithmica. 79 \(Sep, 2017\), pp 66-95, IPEC2015, arXiv:1504.05905](#)
- 7) Linear rank-width of distance-hereditary graphs I. A polynomial time algorithm
Isolde Adler, Mamadou Kanté, and **O-joong Kwon**
[Algorithmica. 78 \(May, 2017\), pp 342-377, WG2014, arXiv:1403.1081](#)
- 6) Coloring graphs without fan vertex-minors and graphs without cycle pivot-minors
Ilkyoo Choi, **O-joong Kwon**, and Sang-il Oum
[Journal of Combin. Theory Ser. B. 123 \(March, 2017\), pp. 126-147, arXiv:1512.03481](#)
- 5) Characterizing width two for variants of treewidth
Hans L. Bodlaender, Stefan Kratsch, Vincent Kreuzen, **O-joong Kwon**, and Seongmin Ok
[Discrete Applied Math. 216 \(Jan 10, 2017\), pp. 29-46, arXiv:1404.3155](#)

- 4) Tree-depth and vertex-minors
 Pétr Hlineny, **O-joung Kwon**, Jan Obdrzalek, and Sebastian Ordyniak
[European J. Combin. 56 \(August, 2016\), pp. 46-56, arXiv:1403.7024](#)
- 3) Excluded vertex-minors for graphs of linear rank-width at most k
 Jisu Jeong, **O-joung Kwon** and Sang-il Oum
[European J. Combin. 41\(October, 2014\), pp. 242-257, STACS2013, arXiv:1311.2618](#)
- 2) Unavoidable vertex-minors in large prime graphs
O-joung Kwon and Sang-il Oum
[European J. Combin. 41\(October, 2014\), pp. 100-127, arXiv:1306.3066](#)
- 1) Graphs of small rank-width are pivot-minors of graphs of small tree-width
O-joung Kwon and Sang-il Oum
[Discrete Applied Math. 168\(May 11, 2014\), pp. 108-118, arXiv:1203.3606](#)

**REFEREED
 CONFERENCE
 PAPERS
 WITHOUT
 JOURNAL
 VERSION**

- 10) Well-partitioned chordal graphs: obstruction set and disjoint paths
 Jungho Ahn, Lars Jaffke, **O-joung Kwon**, and Paloma T. Lima [WG 2020 arXiv:2002.10859](#)
- 9) The Directed Flat Wall Theorem
 Archontia Giannopoulou, Ken-ichi Kawarabayashi, **O-joung Kwon**, and Stephan Kreutzer
[SODA 2020](#)
- 8) Tree pivot-minors and linear rank-width
 Konrad Dabrowski, Francois Dross, Jisu Jeong, Mamadou Kanté, **O-joung Kwon**, Sang-il Oum,
 and Daniel Paulusma
[EUROCOMB 2019](#)
- 7) Measuring what Matters: A Hybrid Approach to Dynamic Programming with Treewidth
 Eduard Eiben, Robert Ganian, Thekla Hamm, and **O-joung Kwon**
[MFCS 2019 \(arXiv:1908.10132\)](#)
- 6) Lean tree-cut decompositions: obstructions and algorithms
 Archontia Giannopoulou, **O-joung Kwon**, Jean-Florent Raymond, and Dimitrios M. Thilikos
[The 36th International Symposium on Theoretical Aspects of Computer Science \(STACS 2019\)](#)
- 5) Recognizing small pivot-minors
 Konrad Dabrowski, Francois Dross, Jisu Jeong, Mamadou Kanté, **O-joung Kwon**, Sang-il Oum,
 and Daniel Paulusma
[44th International Workshop on Graph-Theoretic Concepts in Computer Science \(WG 2018\)](#)
- 4) Erdos-Posa property of chordless cycles and its applications
 Eun Jung Kim and **O-joung Kwon**
[SIAM: ACM-SIAM Symposium on Discrete Algorithms \(SODA 2018\)](#)
 Full version : <https://arxiv.org/abs/1711.00667>.
- 3) Neighborhood complexity and kernelization for nowhere dense classes of graphs.
 Kord Eickmeyer, Archontia Giannopoulou, Stephan Kreutzer, **O-joung Kwon**, Michal Pilipczuk,
 Roman Rabinovich, and Sebastian Siebertz
[The 44th International Colloquium on Automata, Languages, and Programming \(ICALP 2017\)](#)
 Full version : <https://arxiv.org/abs/1612.08197>
- 2) A polynomial kernel for Distance-Hereditary Vertex Deletion.
 Eun Jung Kim and **O-joung Kwon**.
[The 15th Algorithms and Data Structures Symposium \(WADS 2017\)](#)
 Full version : <https://arxiv.org/abs/1610.07229>

1) Parameterized vertex deletion problems for hereditary graph classes with a block property.
 Edouard Bonnet, Nick Brettell, **O-joung Kwon**, and Dániel Marx.
[42nd International Workshop on Graph-Theoretic Concepts in Computer Science \(WG 2016\)](#)
 Full version : <https://arxiv.org/abs/1603.05945>

**NEW
 SUBMITTED
 MANUSCRIPTS**

3. Erdos-Posa property of minor-models with prescribed vertex sets (with Dániel Marx) arXiv:1904.00879
2. Branch-depth: Generalizing tree-depth of graphs (with Matt DeVos and Sang-il Oum) arXiv:1903.11988
1. Packing and covering induced subdivisions (with Jean-Florent Raymond) arXiv:1803.07581

**HONORS AND
 GRANTS**

- | | |
|---|-----------------|
| RWTH Aachen University Research Fellowship Korea | Jan - Mar, 2015 |
| KIAS Fellowship for
Seoul ICM 2014 | August, 2014 |
| SIAM Student Travel Award for
SIAM Conference on Discrete Mathematics | June, 2014 |
| Travel Grants for graduate students and young researchers for
14th Max Planck Advanced Course on the Foundations of Computer Science | Aug, 2013 |
| National Research Scholarship by the Korea Student Aid Foundation | Sep, 2010 ~ |
| National Scholarship for Science and Engineering Students (KOSAF)
- Tuition exemption | 03-04, 08-10 |

**RESEARCH
 VISITINGS**

- | | |
|---|------------------------------|
| University of Bari, Bari, Italy
Hosted by Prof. Paul Wollan | 13–17. Nov. 2017 |
| University of Waterloo, Waterloo, Canada
Hosted by Dr. Ringi Kim | 24–28. Jul. 2017 |
| University of Lyon, Lyon, France
Hosted by Dr. Valia Mitsou | 3–7. Apr. 2017 |
| Universidad Politecnica de Valencia, Valencia, Spain
Hosted by Prof. Jan Arne Telle | 27. Mar. 2017 - 1. Apr. 2017 |
| Durham University, Durham, UK
Hosted by Prof. Daniel Paulusma | 27. Feb. 2017 - 3. Mar. 2017 |
| University of Warsaw, Warsaw, Poland
Hosted by Prof. Marcin Pilipczuk | 11–13. Jan. 2017 |
| Universite Blaise Pascal in Clermont-ferrand, France
Hosted by Prof. Mamadou Moustapha Kanté | 7–12. Nov. 2016 |
| University of Bergen in Bergen, Norway
Hosted by Prof. Jan Arne Telle | 22–28. May. 2016 |
| TU Wien in Vienna, Austria
Hosted by Dr. Robert Ganian | 14–18. Mar. 2016 |
| Masaryk University in Brno, Czech
Hosted by Prof. Pétr Hlineny | 16–20, Nov, 2015 |

MTA SZTAKI in Budapest, Hungary Hosted by Prof. Dániel Marx	22–28, Mar, 2015
Denmark Technical University in Lyngby, Denmark Hosted by Prof. Carsten Thomassen	23–27, Feb, 2015
Bonn University in Bonn, Germany Hosted by Prof. Stefan Kratsch	16–18, Feb, 2015
LIRMM in Montpellier, France Hosted by Prof. Christophe Paul	26–30, Jan, 2015
RWTH Aachen University in Aachen, Germany Hosted by Prof. Peter Rossmanith	6, Jan, 2015 - 31, Mar, 2015
Universite Blaise Pascal in Clermont-ferrand, France Hosted by Prof. Mamadou Moustapha Kanté	7–21, Jul, 2014
Utrecht University in Utrecht, Netherlands Hosted by Prof. Hans Bodlaender	15, Feb, 2014 - 7, Mar, 2014
Universite Blaise Pascal in Clermont-ferrand, France Hosted by Prof. Mamadou Moustapha Kanté	8–21, Jul, 2013
Masaryk University in Brno, Czech Hosted by Prof. Pétr Hlineny	19–24, May, 2013
University of Hamburg in Hamburg, Germany Hosted by Prof. Reinhard Diestel	13, Feb, 2013 - 31, Aug, 2013
RESEARCH TALKS	
Erdos-Posa property of H-induced subdivisions Oberwolfach workshop on graph theory	7-11, Jan, 2019
A unified poly-time algorithm for FVS on graphs of bounded mim-width KSIAM conference	2-4, Nov, 2018
Ajou Combinatorics Workshop	26, Oct, 2018
13th International Symposium on Parameterized and Exact Computation (IPEC) 2018 at Aalto University in Helsinki, Finland	22-24, Aug, 2018.
Invited talk at 2018 Combinatorics Workshop, SNU, Korea	17-18, Aug, 2018.
2018 SIAM Discrete Math Conference, University of Colorado, Denver, USA	4-8 June, 2018.
Seminar at SUNY Korea, Incheon, South Korea	1 June, 2018.
86th KPPY Combinatorics Workshop at PNU, Pusan, South Korea	4 May, 2018.
Seminar at Hanyang University, Seoul, South Korea	1 May, 2018
2018 spring annual meeting of the KMS, Kyunghee University, Seoul, Korea	21 Apr, 2018
Erdos-Posa property of chordless cycles and applications Discrete Math Seminar at KAIST	12 Jan, 2018.
Eurocomb 2017 at TU Vienna, Vienna, Austria	31th Aug, 2017.

A polynomial kernel for Distance-Hereditary Vertex Deletion
 An optimal XP algorithm for Hamiltonian Cycle on graphs of bounded clique-width
 Algorithms and Data Structures Symposium 2017 at Memorial Univ of Newfoundland, St. John's,
 Canada
 31 July-2 Aug, 2017.

Chi-boundedness of graph classes excluding wheel vertex-minors
 Structure in Graphs and Matroids 2017 at Univ. of Waterloo, Waterloo, Canada 19 July, 2017.

ICALP satellite conference. Algorithms and Structure for Sparse Graphs at Univ. Warsaw, Warsaw,
 Poland 16 July, 2017.

Discrete Math Seminar at KAIST 9 Jun, 2017.

Seminar at TU Berlin, Berlin, Germany 28 Apr, 2017

Low rank-width colorings
 Graphes at Lyon, Lyon, France 7 Apr, 2017

Algorithmic perspective of rank-width
 Acid Seminar at Durham University, Durham, UK 27 Feb, 2017

Seminar at University of Warsaw, Warsaw, Poland 12 Jan, 2017

The 14th KIAS Combinatorics Workshop at Busan 19 Dec, 2016

80th KPPY Combinatorics Workshop at Yeungnam Univ, Daegu 17 Dec, 2016

Generalized feedback vertex set problems on bounded-treewidth graphs
 KAIST Discrete Math Seminar at KAIST 25 Nov, 2016

Parameterized complexity of measuring distances to dense graph classes
 Colloquium talk on Methods for Discrete Structures, Berlin, Germany 24 Oct, 2016

Coloring graphs without fan vertex-minors and cycle pivot-minors
 Southern Italian Workshop on Algorithms and Graphs 2016, Bari, Italy 26 Sep, 2016

A single-exponential fixed parameter algorithm for Distance-Hereditary Vertex Deletion
 MFCS 2016, Krakow, Poland 22 Aug, 2016

Seminar at University of Bergen, Bergen, Norway 27 May, 2016

Seminar at MTA SZTAKI, Budapest, Hungary 5 May, 2016

Deletion problems regarding graphs of bounded rank-width
 Seminar at TU Wien in Vienna, Austria 14. Mar, 2016

Seminar at Masaryk University, Brno, Czech 16, Nov, 2015

Seminar at MTA SZTAKI, Budapest, Hungary 28, Oct, 2015

Erdős-Pósa property of planar- H -minor models with prescribed vertex sets
 7th GROW, Aussois, France 12, Oct, 2015

A polynomial kernel for Block Graph Deletion
 IPEC 2015, Patras, Greece 16, Sep, 2015

An FPT algorithm and a polynomial kernel for linear rank-width one vertex deletion IPEC 2015, Patras, Greece	16, Sep, 2015
A polynomial kernel for Block Graph Deletion Seminar at MTA SZTAKI, Budapest, Hungary	29, Jul, 2015
Block Graph Deletion Seminar at Korea University, Seoul, Korea	29, May, 2015
Linear Rank-width One Vertex Deletion 2015 spring annual meeting of the KMS, Pusan National University	25, Apr, 2015
Length constraint versions of Gallai's A -path Theorem Seminar at KAIST	15, Apr, 2015
A fixed parameter tractable algorithm for the Rank-width 1 Vertex Deletion problem Seminar at Bonn University, Bonn, Germany	18, Feb, 2015
Linear rank-width of distance-hereditary graphs CIRM workshop on Graph Decompositions, Marseille, France	22, Jan, 2015
Fixed parameter tractability of the thread vertex deletion problem 66th KPPY Combinatorics Workshop, Yeungnam University	20, Sep, 2014
Excluded vertex-minors for linear rank-width at most k ICM 2014, COEX, Seoul, Korea	13, August, 2014
Linear rank-width of distance-hereditary graphs ICM 2014 Satellite Conference on Extremal and Structural Graph Theory The-K Gyeongju Hotel, Gyeongju, Korea	8, August, 2014
Linear rank-width of distance-hereditary graphs WG 2014, Le Domaine de Chales, Orleans, France	26, June, 2014
Excluded vertex-minors for linear rank-width at most k 2014 SIAM Discrete Math Conference Hyatt Regency Minneapolis Minneapolis, Minnesota, USA	18, June, 2014
Linear rank-width of distance-hereditary graphs The 4th KIAS Combinatorics Workshop, KIAS	30, May, 2014
Characterizing width two for variants of tree-width 2014 spring annual meeting of the KMS, Wonju University	25, Apr, 2014
Characterizing width two for variants of tree-width 6th GRASTA, Institut d'Etudes Scientifiques of Cargse, Corsica, France	31, Mar, 2014
Characterizing width two for variants of tree-width Seminar at Utrecht University in Utrecht, Netherlands	28, Feb, 2014
Characterizing width two for variants of tree-width Dagstuhl seminar on Graph Modification Problems, Dagstuhl, Germany	14, Feb, 2014
Unavoidable vertex-minors in large prime graphs 12th Korea-Japan Workshop on Algebra and Combinatorics, KAIST	23, Jan, 2014
Tree-like structure of distance-hereditary graphs	

Seminar at Hanyang University Hanyang University	29, Nov, 2013
Characterizing width two for variants of tree-width NIMS Workshop, Daejeon, Korea	28, Nov, 2013
Tree-like structure of distance-hereditary graphs 60th KPPY Combinatorics Workshop, Kyungbook University	9, Nov, 2013
Unavoidable vertex-minors in large prime graphs 2013 annual meeting of the KMS University of Seoul	25, Oct, 2013
Unavoidable vertex-minors in large prime graphs Discrete Math Seminar at KAIST	4, Oct, 2013
Unavoidable vertex-minors in large prime graphs Seminar at University of Hamburg in Hamburg, Germany	5, June, 2013
Graphs of small rank-width are pivot-minors of graphs of small tree-width Seminar at Masaryk University, Brno, Czech	20, May, 2013
Excluded vertex-minors for graphs of linear rank-width at most k STACS 2013, University of Kiel, Kiel, Germany	28, Feb, 2013
Graphs of small rank-width are pivot-minors of graphs of small tree-width 2012 annual meeting of the KMS, Daejeon, Korea	6, Oct, 2012
Graphs of small rank-width are pivot-minors of graphs of small tree-width 2012 SIAM Discrete Math Conference Dalhousie university, Halifax, Canada	22, June, 2012
Binary matroid and fundamental graph Seminar for graduate students KAIST, Daejeon, Korea	1, May, 2012
Pivot-minors and vertex-minors of trees and paths 5th GROW, KAIST, Daejeon, Korea	28, Oct, 2011

**TEACHING
EXPERIENCES**

Spring 2019 : Combinatorics and graph theory, Abstract algebra, Mathematical programming
 Fall 2018 : Combinatorics and graph theory
 Spring 2018 : Number theory, Combinatorial optimization

<i>Teaching assistant</i> : Introduction to Graph Theory (MAS477)	Fall 2014
<i>Teaching assistant</i> : Discrete mathematics (MAS255)	Spring 2014
<i>Teaching assistant</i> : Introduction to Graph Theory (MAS477)	Fall 2012
<i>Teaching assistant</i> : Discrete mathematics (MAS255)	Spring 2012
<i>Teaching assistant</i> : Introduction to Graph Theory (MAS477)	Fall 2011
<i>Teaching assistant</i> : Discrete mathematics (MAS255)	Spring 2011