

## O-joung Kwon

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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

14) Chi-boundedness of graph classes excluding wheel vertex-minors

Hojin choi, **O-joung 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-joung 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-joung 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-joung 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-joung 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-joung 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-joung 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-joung 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-joung 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-joung Kwon**, and Seongmin Ok  
[Discrete Applied Math. 216 \(Jan 10, 2017\), pp. 29-46, arXiv:1404.3155](#)

4) Tree-depth and vertex-minors  
Pétri 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**

12) 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 \(STACS 2019\)](#)

11) Generalized distance domination problems and their complexity on graphs of bounded mim-width  
Lars Jaffke, **O-joung Kwon**, Torstein Stromme, and Jan Arne Telle  
[The 13th International Symposium on Parameterized and Exact Computation \(IPEC 2018\)](#)

10) Recognizing small pivot-minors  
Konrad Dabrowski, Francois Dross, Jisu Jeong, Mamadou Kant, **O-joung Kwon**, Sang-il Oum, and Daniel Paulusma  
[44th International Workshop on Graph-Theoretic Concepts in Computer Science \(WG 2018\)](#)

9) A unified polynomial-time algorithm for Feedback Vertex Set on graphs of bounded mim-width  
Lars Jaffke, **O-joung Kwon**, and Jan Arne Telle  
[The 35th International Symposium on Theoretical Aspects of Computer Science \(STACS 2018\)](#)

Full version : <https://arxiv.org/abs/1710.07148>.

8) 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>.

7) Polynomial-time algorithms for the Longest Induced Path and Induced Disjoint Paths problems on graphs of bounded mim-width

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

[The 12th International Symposium on Parameterized and Exact Computation \(IPEC 2017\)](#)

Full version : <https://arxiv.org/abs/1708.04536>.

6) Generalized feedback vertex set problems on bounded-treewidth graphs: chordality is the key to single-exponential parameterized algorithms.

Édouard Bonnet, Nick Brettell, **O-joung Kwon**, and Dániel Marx

[The 12th International Symposium on Parameterized and Exact Computation \(IPEC 2017\)](#)

Full version : <http://arxiv.org/abs/1704.06757>.

5) On low rank-width colorings.

**O-joung Kwon** and Michał Pilipczuk and Sebastian Siebertz

[43rd International Workshop on Graph-Theoretic Concepts in Computer Science \(WG 2017\)](#)

Full version : <https://arxiv.org/abs/1703.03304>

4) Neighborhood complexity and kernelization for nowhere dense classes of graphs.

Kord Eickmeyer, Archontia Giannopoulou, Stephan Kreutzer, **O-joung Kwon**, Michał 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>

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

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

[The 15th Algorithms and Data Structures Symposium \(WADS 2017\)](#)

Full version : <https://arxiv.org/abs/1702.06095>

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**

5. Erdos-Posa property of minor-models with prescribed vertex sets (with Dániel Marx) arXiv:1904.00879
4. Branch-depth: Generalizing tree-depth of graphs (with Matt DeVos and Sang-il Oum) arXiv:1903.11988
3. Classes of graphs with no long cycle as a vertex-minor are polynomially chi-bounded (with Ringi Kim, Sang-il Oum, and Vaidy Sivaraman) arXiv:1809.04278
2. Packing and covering induced subdivisions (with Jean-Florent Raymond) arXiv:1803.07581
1. Scattered classes of graphs (with Sang-il Oum) arXiv:1801.06004

**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
<b>RESEARCH VISITINGS</b>	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	6, Jan, 2015 - 31, Mar, 2015

Hosted by Prof. Peter Rossmanith

Universite Blaise Pascal in Clermont-ferrand, France 7–21, Jul, 2014  
Hosted by Prof. Mamadou Moustapha Kanté

Utrecht University in Utrecht, Netherlands 15, Feb, 2014 - 7, Mar, 2014  
Hosted by Prof. Hans Bodlaender

Universite Blaise Pascal in Clermont-ferrand, France 8–21, Jul, 2013  
Hosted by Prof. Mamadou Moustapha Kanté

Masaryk University in Brno, Czech 19–24, May, 2013  
Hosted by Prof. Pétr Hlineny

University of Hamburg in Hamburg, Germany 13, Feb, 2013 - 31, Aug, 2013  
Hosted by Prof. Reinhard Diestel

**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