Oskar Skibski

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Personal

Address:	Banacha 2, 02-097 Warszawa, Poland (room: 5010)
Contact:	oskar.skibski@mimuw.edu.pl | http://mimuw.edu.pl/∼oski
Other:	07.07.1987, Szczecin, Poland (birth) | Married with two kids

Employment

X 2016 – *present*	Assistant Professor (pl: *adiunkt*) at University of Warsaw, PL
X 2015 – IX 2016	Teaching Assistant (pl: *asystent*) at University of Warsaw, PL
X 2014 – IX 2015	Assistant Professor at Kyushu University, Fukuoka, Japan
VII 2014 – IX 2014	Postdoctoral Fellow at Kyushu University, Fukuoka, Japan

Education

2010 – 2014	PhD in Computer Science | University of Warsaw Thesis: *Shapley Value for Games with Externalities and Games on Graphs* Supervisors: Andrzej Szałas, Tomasz Michalak
2005 – 2010	Master of Science in Computer Science | University of Warsaw Thesis: *Computing the Shapley Value Extended to Coalitional Games with Externalities* | Supervisors: Andrzej Szałas, Tomasz Michalak

Awards & Honors

- 2023 – Distinguished Senior PC Member at IJCAI-23.
- 2023 – Medal Filca for the best talk at a popular science conference *Szkoła Matematyki Poglądowej*.
- 2021 – Scholarships from the Minister of Science and Higher Education for outstanding young scientists.
- 2019 – OPUS grant from the National Science Centre, Poland.
- 2018 – Visiting Professor at Université Paris-Dauphine.
- 2017 – Invited talk at TEDxWarsaw.
- 2016 – HOMING grant from the Foundation for Polish Science.
- 2016 – SONATA grant from the National Science Centre, Poland.
- 2015 – Special Jury Award for the Best Theoretical PhD Dissertation in Poland from PSSI.
- 2014 – Scholarship from the Office of the Marshal of the Mazovia Region.

Students

- PhD students:
  - Tomasz Wąs (University of Warsaw, defense: 08.07.2022, confirmed: 29.09.2022)
- Master's students
  - Magdalena Grodzińska (2021), Paweł Bieliński (2021), Julia Nuszel (2021), Wiktoria Kośny (2022), Natalia Kucharczuk (2023)
- Bachelor students
  - Mateusz Zacharecki (2023)

Grants

2019 – 2023	Group Centrality Measures: Axioms, Algorithms and Applications (Principal Investigator) | National Science Centre | OPUS 2018/31/B/ST6/03201 Amount of funding: 868 700 PLN
2016 – 2020	Computational Analysis of Applied Weighted Voting Games (Principal Investigator) | National Science Centre | SONATA 2015/19/D/ST6/03113 Amount of funding: 217 320 PLN
2016 – 2018	Centrality Measures: from Theory to Applications (Principal Investigator) Foundation for Polish Science | HOMING 2016-1/7 Amount of funding: 796 260 PLN

Committees

- Senior Program Committee Member:
  - AAAI-24 – 38th AAAI Conference on Artificial Intelligence
  - IJCAI-23 – 32nd International Joint Conference on Artificial Intelligence
  - AAAI-23 – 37th AAAI Conference on Artificial Intelligence
  - AAAI-22 – 36th AAAI Conference on Artificial Intelligence
  - IJCAI-21 – 30th International Joint Conference on Artificial Intelligence
  - ECAI-20 – 24th European Conference on Artificial Intelligence
- Program Committee Member:
  - AAMAS-23 – 22nd Int. Conference on Autonomous Agents and Multiagent Systems
  - IJCAI-22 – 31st International Joint Conference on Artificial Intelligence
  - AAMAS-22 – 21st Int. Conference on Autonomous Agents and Multiagent Systems
  - AAAI-21 – 35th AAAI Conference on Artificial Intelligence
  - IJCAI-20 – 29th International Joint Conference on Artificial Intelligence
  - AAMAS-20 – 19th Int. Conference on Autonomous Agents and Multiagent Systems
  - AAAI-20 – 34th AAAI Conference on Artificial Intelligence
  - IJCAI-19 – 28th International Joint Conference on Artificial Intelligence
  - AAMAS-19 – 18th Int. Conference on Autonomous Agents and Multiagent Systems
  - AAAI-19 – 33rd AAAI Conference on Artificial Intelligence
  - IJCAI-18 – 27th International Joint Conference on Artificial Intelligence

  - AAAI-18 – 32nd AAAI Conference on Artificial Intelligence
  - IJCAI-17 – 26th International Joint Conference on Artificial Intelligence
  - AAAI-17 – 31st AAAI Conference on Artificial Intelligence
  - IJCAI-16 – 25th International Joint Conference on Artificial Intelligence
  - AAMAS-16 – 15th Int. Conference on Autonomous Agents and Multiagent Systems
  - AAAI-16 – 30th AAAI Conference on Artificial Intelligence
  - IJCAI-15 – 24th International Joint Conference on Artificial Intelligence
  - AAMAS-15 – 14th Int. Conference on Autonomous Agents and Multiagent Systems
  - AAAI-15 – 29th AAAI Conference on Artificial Intelligence
  - AAAI-14 – 28th AAAI Conference on Artificial Intelligence

- Co-organizer:
  - Forum Informatyki Teoretycznej (FIT-17), Warsaw, Poland, 2017
  - 3rd International Workshop on Market Design Technologies for Sustainable Development, Yokohama, Japan, 2015
  - IJCAI-15 Workshop on Innovative Applications of Game Theory and Market Design, Buenos Aires, Argentina, 2015
  - 2nd International Workshop on Market Design Technologies for Sustainable Development, Yokohama, Japan, 2014

- Reviewer: (updated on January 1)
  - Artificial Intelligence
  - Autonomous Agents and Multi-Agent Systems
  - Computational Intelligence
  - Computational Social Networks
  - Discrete Applied Mathematics
  - Mathematics of Operations Research
  - European Journal of Operational Research,
  - Fundamenta Informaticae
  - IEEE Intelligent Systems
  - IEEE Transactions on Fuzzy Systems
  - Information Sciences
  - International Journal of Applied Mathematics and Computer Science
  - International Journal of Approximate Reasoning
  - International Journal of Game Theory
  - Journal of Artificial Intelligence Research
  - PLOS ONE
  - Social Choice and Welfare
  - Theory and Decision
  - Conferences: STACS-20, CIKM-19, AAMAS-13, AAAI-13, AAMAS-11.

Publications

Journal papers:

1. O.Skibski. *Complexity of Computing the Shapley Value in Partition Function Form Games*. Journal of Artificial Intelligence Research 77, pp. 1237-1274, 2023.
2. T.Wąs, O.Skibski. *Axiomatic Characterization of PageRank*. Artificial Intelligence 318, pp. 103900, 2023.
3. O.Skibski. *Closeness centrality via the Condorcet principle*. Social Networks 74, pp. 13–18, 2023.
4. O.Skibski, T.Suzuki, T.Grabowski, Y.Sakurai, T.Michalak, M.Yokoo. *Measuring power in coalitional games with friends, enemies and allies*. Artificial Intelligence 313, pp. 103792, 2022.
5. O.Skibski, T.Michalak, Y.Sakurai, M.Wooldridge, M.Yokoo. *Partition Decision Trees: Representation for Efficient Computation of the Shapley Value Extended to Games with Externalities*. Autonomous Agents and Multi-Agent Systems 31(1): 11, 2020.
6. O.Skibski, T.Michalak. *Fair Division in the Presence of Externalities*. International Journal of Game Theory 49(1), pp. 147–172, 2020.
7. O.Skibski, T.Rahwan, T.Michalak, M.Yokoo. *Attachment Centrality: Measure for Connectivity in Networks*. Artificial Intelligence 274, pp. 151–179, 2019.
8. O.Skibski, T.Rahwan, T.Michalak, M.Wooldridge. *Enumerating Connected Subgraphs and Computing the Myerson and Shapley Values in Graph-restricted Games*. ACM Transactions on Intelligent Systems and Technology, 10(2): 15, 2019.
9. B.Alshebli, T.Michalak, O.Skibski, M.Wooldridge, T.Rahwan. *A Measure of Added Value in Groups*. ACM Transactions on Autonomous and Adaptive Systems 13(4): 18, 2019.
10. O.Skibski, T.Michalak, T.Rahwan. *Axiomatic Characterization of Game-Theoretic Centrality*. Journal of Artificial Intelligence Research 62, pp. 33–68, 2018.
11. O.Skibski, T.Michalak, M.Wooldridge. *The Stochastic Shapley Value for Coalitional Games with Externalities*. Games and Economic Behavior 108, pp. 65–80, 2018.
12. O.Skibski, M.Yokoo. *An Algorithm for the Myerson Value in Probabilistic Graphs with an Application to Weighted Voting*. IEEE Intelligent Systems 32(1), pp. 32–39, 2017.
13. T.Michalak, T.Rahwan, O.Skibski, M.Wooldridge. *Defeating Terrorist Networks with Game Theory*. IEEE Intelligent Systems 30(1), pp. 53–61, 2015.
14. T.Michalak, T.Rahwan, S.Moretti, R.Narayanam, O.Skibski, P.Szczepański, M.Wooldridge. *A New Approach to Measure Social Capital using Game-Theoretic Techniques*. ACM SIGecom Exchanges, pp. 95–100, 2015.

Conference papers:

1. W.Kośny, O.Skibski. *Axiomatic Analysis of Medial Centrality Measures*. Proceedings of the 22nd International Conference on Autonomous Agents and Multiagent Systems (AAMAS-23), pp. 2188–2196, 2023.
2. C.Riveros, J.Salas, O.Skibski. *How do centrality measures choose the root of trees?* Proceedings of the 26th International Conference on Database Theory (ICDT-23), pp. 12:1–12:17, 2023.
3. N.Kucharczuk, T.Wąs, O.Skibski. *PageRank for Edges: Axiomatic Characterization*. Pro-

ceedings of the 36th AAAI Conference on Artificial Intelligence (AAAI-22), pp. 5108–5115, 2022.

4. O.Skibski. *Vitality Indices are Equivalent to Induced Game-Theoretic Centralities*. Proceedings of the 30th International Joint Conference on Artificial Intelligence (IJCAI-21), pp. 398–404, 2021.
5. T.Wąs, O.Skibski. *An Axiom System for Feedback Centralities*. Proceedings of the 30th International Joint Conference on Artificial Intelligence (IJCAI-21), pp. 443-449, 2021.
6. O.Skibski. *Complexity of Computing the Shapley Value in Games with Externalities*. Proceedings of the 34th AAAI Conference on Artificial Intelligence (AAAI-20), pp. 2244–2251, 2020.
7. O.Skibski, T.Suzuki, T.Grabowski, T.Michalak, M.Yokoo. *Signed Graph Games: Coalitional Games with Friends, Enemies and Allies*. Proceedings of the 19th International Conference on Autonomous Agents and Multiagent Systems (AAMAS-20), pp. 1287–1295, 2020.
8. T.Wąs, T.Rahwan, O.Skibski. *Random Walk Decay Centrality*. Proceedings of the 33rd AAAI Conference on Artificial Intelligence (AAAI-19), pp. 2197-2204, 2019.
9. J.Sosnowska, O.Skibski. *Path Evaluation and Centralities in Weighted Graphs – An Axiomatic Approach*. Proceedings of the 27th International Joint Conference on Artificial Intelligence (IJCAI-18), pp. 3856–3862, 2018.
10. T.Wąs, O.Skibski. *Axiomatization of the PageRank Centrality*, Proceedings of the 27th International Joint Conference on Artificial Intelligence (IJCAI-18). pp. 3898–3904, 2018.
11. O.Skibski, J.Sosnowska. *Axioms for Distance-Based Centralities*. Proceedings of the 32nd AAAI Conference on Artificial Intelligence (AAAI-18), pp. 1218–1225, 2018.
12. T.Wąs, O.Skibski. *An Axiomatization of the Eigenvector and Katz Centralities*. Proceedings of the 32nd AAAI Conference on Artificial Intelligence (AAAI-18), pp. 1258–1265, 2018.
13. J.Sosnowska, O.Skibski. *Attachment Centrality for Weighted Graphs*. Proceedings of the 26th International Joint Conference on Artificial Intelligence (IJCAI-17), pp. 416–422, 2017.
14. O.Skibski, T.Michalak, T.Rahwan. *Axiomatic Characterization of Game-Theoretic Network Centralities*. Proceedings of the 31st AAAI Conference on Artificial Intelligence (AAAI-17), pp. 698–705, 2017.
15. O.Skibski, H.Michalewski, A.Nagorko, T.Michalak, A.Dowell, T.Rahwan, M.Wooldridge. *Non-Utilitarian Coalition Structure Generation*. 22nd European Conference on Artificial Intelligence (ECAI-16) (short paper), pp. 1738-1739, 2016.
16. O.Skibski, T.Rahwan, T.Michalak, M.Yokoo. *Attachment Centrality: An Axiomatic Approach to Connectivity in Networks*. Proceedings of the 15th International Conference on Autonomous Agents and Multiagent Systems (AAMAS-16), pp. 168–176, 2016.
17. O.Skibski, S.Matejczyk, T.Michalak, M.Wooldridge, M.Yokoo. *k-Coalitional Cooperative Games*. Proceedings of the 15th International Conference on Autonomous Agents and Multiagent Systems (AAMAS-16), pp. 177–185, 2016.
18. O.Skibski, T.Michalak, Y.Sakurai, M.Yokoo. *A Pseudo-Polynomial Algorithm for Computing Power Indices in Graph-Restricted Weighted Voting Games*. Proceedings of the 24th International Joint Conference on Artificial Intelligence (IJCAI-15), pp. 631–637, 2015.
19. O.Skibski, T.Michalak, Y.Sakurai, M.Wooldridge, M.Yokoo. *A Graphical Representation for Games in Partition Function Form*. Proceedings of the 29th AAAI Conference on Artificial Intelligence (AAAI-15), pp. 1036–1042, 2015.
20. R.Narayanam, O.Skibski, H.Lamba, T.Michalak. *A Shapley Value-based Approach to De-*

termine Gatekeepers in Social Networks with Applications. Proceedings of the 21st European Conference on Artificial Intelligence (ECAI-14), pp. 651–656, 2014.

21. O.Skibski, T.Michalak, T.Rahwan, M.Wooldridge. *Algorithms for the Shapley and Myerson Values in Graph-restricted Games*. Proceedings of the 13th International Conference on Autonomous Agents and Multiagent Systems (AAMAS-14), pp. 197–204, 2014.
22. T.Michalak, T.Rahwan, P.Szczepański, O.Skibski, R.Narayanam, M.Wooldridge, N.Jennings. *Computational Analysis of Connectivity Games with Applications to Terrorist Networks*. Proceedings of the 22nd International Joint Conference on Artificial Intelligence (IJCAI-13), pp. 293–301, 2013.
23. O.Skibski. *Steady Marginality: A Uniform Approach to Shapley Value for Games with Externalities*. Proceedings of the 4th Symposium on Algorithmic Game Theory (SAGT-11), LNCS 6982, pp. 130–142, Springer-Verlag, 2011.

Popular science

Since 2021: Editor of Delta – a Polish popular science magazine.

Articles:

- *Algorytm magicznych piątek*, Delta 07/2023
- *Jak pan Marek wybierał gospodarza*, Delta 04/2023
- *Czarna skrzynka*, Delta 02/2023
- *Jak podzielić lody, czyli o nukleolusie*, Delta 04/2022
- *Klucze, skarbonki, młotek i superzapis*, Delta 02/2022
- *Problem bankructwa z Talmudu*, Delta 10/2021
- *O tym, jak żyć królików doświadczalnych w matematyce*, Delta 08/2021
- *Gry głosowania ważonego*, Delta 11/2020
- *Rozbijanie sieci terrorystycznych za pomocą teorii gier*, Delta 11/2016

Presentations:

- *Tajemnica z Talmudu*, Szkoła Matematyki Poglądowej, 25.08.2021
- *Dlaczego lew jest groźny?*, Festiwal Nauki, 24.09.2021
- *Tajemnica z Talmudu*, Festiwal Nauki, 25.09.2021
- *Interpretacje kombinatoryczne, czyli o tym, jak użyć królików doświadczalnych w matematyce*, Festiwal Nauki, 26.09.2018
- *Czy matematyka może zlikwidować sieci terrorystyczne?*, Festiwal Nauki, 27.09.2017
- *Connecting the dots*, Talk'n'Roll, 26.09.2017
- *O tym, co łączy koty w czapkach z sieciami terrorystycznymi*, Dzień Inspiracji w Staszicu, 21.06.2017
- *Kropka w kropkę*, TEDxWarsaw, 23.03.2017

Videos:

- *Game Theory in AI* – series of 8 lectures (Youtube channel: MAP - Mistrzostwa w Algorytmice i Programowaniu), `https://www.youtube.com/watch?v=v8TasZBJ5FQ`
- *Discrete Mathematics* – series of 23 short videos (Youtube channel: Oskar Skibski), `https://www.youtube.com/@oskarskibski/`

Teaching

Classes at the Faculty of Mathematics, Informatics and Mechanics, University of Warsaw:

- 2022/23 | Coalitional Game Theory lecture (coordinator), 30h
- 2022/23 | Discrete Mathematics tutorials (x2), 60h
- 2021/22 | Coalitional Game Theory lecture (coordinator), 30h
- 2021/22 | Discrete Mathematics tutorials (x2), 60h
- 2020/21 | Algorithmic Coalitional Game Theory lecture+tutorials (coordinator), 60h
- 2020/21 | Discrete Mathematics tutorials (x2), 60h
- 2020/21 | Introduction to Social Networks Analysis lecture+tutorials (co-coordinator), 60h
- 2019/20 | Algorithmic Coalitional Game Theory lecture+tutorials (coordinator), 60h
- 2019/20 | Discrete Mathematics tutorials (x2), 60h
- 2019/20 | Introduction to Social Networks Analysis lecture+tutorials (co-coordinator), 60h
- 2018/19 | Algorithmic Coalitional Game Theory lecture+tutorials (coordinator), 60h
- 2018/19 | Discrete Mathematics tutorials (x2), 60h
- 2018/19 | Introduction to Social Networks Analysis lecture+tutorials (co-coordinator), 60h
- 2017/18 | Discrete Mathematics tutorials (x2), 60h
- 2015/16 | Databases laboratory, 30h
- 2015/16 | Algorithmic Coalitional Game Theory lecture+tutorials (co-coordinator), 60h
- 2015/16 | Introductory Programming tutorials, 60h
- 2015/16 | Introductory Programming laboratory, 30h
- 2015/16 | Game-theoretic Approach to Social Network Analysis tutorials, 30h
- 2013/14 | Databases laboratory, 30h
- 2013/14 | Discrete Mathematics tutorials, 45h
- 2013/14 | Algorithmic Coalitional Game Theory lecture+tutorials (co-coordinator), 30h
- 2012/13 | Databases laboratory, 30h
- 2012/13 | Algorithmic Coalitional Game Theory lecture+tutorials (co-coordinator), 30h
- 2011/12 | Databases laboratory, 30h
- 2011/12 | Discrete Mathematics tutorials, 45h
- 2010/11 | Databases laboratory, 30h
- 2010/11 | Discrete Mathematics tutorials, 45h