

Oskar Skibski

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Personal

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Other: 07.07.1987, Szczecin, Poland (birth) | Married (wife: Milena, son: Franciszek)

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 Szalas, 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 Szalas, Tomasz Michalak

Awards & Honors

- 2019 – **OPUS grant** from the National Science Centre, Poland.
- 2018 – **Visiting Professor** at Université Paris-Dauphine.
- 2018 – **Award from the Rector of the University of Warsaw** (second degree).
- 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** from Polish Artificial Intelligence Society.
- 2014 – **Scholarship from the Office of the Marshal of the Mazovia Region.**
- Invited Talks (selected):
 - Budapest University of Technology and Economics, Budapest, 24.10.2018.
 - IX Training Conference of Police Crime Intelligence Division, Hel, 26.04.2018.
 - Talk'n'Roll, Kraków, 26.09.2017. (*selected the best talk by the audience*)
 - TEDxWarsaw, Warszawa, 23.03.2017.

Grants

- 2019 – 2022 **Group Centrality Measures: Axioms, Algorithms and Applications** (Principal Investigator) | National Science Centre | OPUS 2018/31/B/ST6/03201
Other members: Tomasz Wąs (PhD Student)
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
Other members: Tomasz P. Michalak (Co-investigator)
Amount of funding: 217 320 PLN
- 2016 – 2018 **Centrality Measures: from Theory to Applications** (Principal Investigator)
Foundation for Polish Science | HOMING 2016-1/7
Other members: Jadwiga Sosnowska, Tomasz Wąs (PhD Students)
Amount of funding: 796 260 PLN

Committees

- **Senior Program Committee Member:**
 - **IJCAI-21** – 30th International Joint Conference on Artificial Intelligence,
 - **ECAI-20** – 24th European Conference on Artificial Intelligence
- **Program Committee Member:**
 - **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, ICDT-20, CIKM-19, AAMAS-13, AAI-13, AAMAS-11.

Publications

Journal papers:

1. 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.
2. O.Skibski, T.Michalak. *Fair Division in the Presence of Externalities*. *International Journal of Game Theory* 49(1), pp. 147–172, 2020.
3. O.Skibski, T.Rahwan, T.Michalak, M.Yokoo. *Attachment Centrality: Measure for Connectivity in Networks*. *Artificial Intelligence* 274, pp. 151–179, 2019.
4. 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.
5. 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.
6. O.Skibski, T.Michalak, T.Rahwan. *Axiomatic Characterization of Game-Theoretic Centrality*. *Journal of Artificial Intelligence Research* 62, pp. 33–68, 2018.
7. O.Skibski, T.Michalak, M.Wooldridge. *The Stochastic Shapley Value for Coalitional Games with Externalities*. *Games and Economic Behavior* 108, pp. 65–80, 2018.

8. 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.
9. T.Michalak, T.Rahwan, O.Skibski, M.Wooldridge. *Defeating Terrorist Networks with Game Theory*. *IEEE Intelligent Systems* 30(1), pp. 53–61, 2015.
10. 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. O.Skibski. *Vitality Indices are Equivalent to Induced Game-Theoretic Centralities*. *Proceedings of the 30th International Joint Conference on Artificial Intelligence (IJCAI-21)*, to appear, 2021.
2. T.Wąs, O.Skibski. *An Axiom System for Feedback Centralities*. *Proceedings of the 30th International Joint Conference on Artificial Intelligence (IJCAI-21)*, to appear, 2021.
3. 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.
4. 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.
5. 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.
6. 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.
7. 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.
8. O.Skibski, J.Sosnowska. *Axioms for Distance-Based Centralities*. *Proceedings of the 32nd AAAI Conference on Artificial Intelligence (AAAI-18)*, pp. 1218–1225, 2018.
9. 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.
10. 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.
11. 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.
12. 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.
13. 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.
14. 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.

15. 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.
16. R.Narayanam, O.Skibski, H.Lamba, T.Michalak. *A Shapley Value-based Approach to Determine Gatekeepers in Social Networks with Applications*. *Proceedings of the 21st European Conference on Artificial Intelligence (ECAI-14)*, pp. 651–656, 2014.
17. 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.
18. 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.
19. 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

Articles:

- *Gry głosowania ważonego*, Delta 11/2020
- *Rozbijanie sieci terrorystycznych za pomocą teorii gier*, Delta 11/2016

Presentations:

- *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

Teaching

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

- 2020/21 | *Algorithmic Coalitional Game Theory* lecture+tutorials (coordinator), 60h
- 2020/21 | *Discrete Mathematics* tutorials, 60h
- 2020/21 | *Discrete Mathematics* tutorials, 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, 60h
- 2019/20 | *Discrete Mathematics* tutorials, 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, 60h
- 2018/19 | Discrete Mathematics tutorials, 60h
- 2018/19 | Introduction to Social Networks Analysis lecture+tutorials (co-coordinator), 60h
- 2017/18 | Discrete Mathematics tutorials, 60h
- 2016/17 | Discrete Mathematics tutorials, 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