

# KRZYSZTOF RZĄDCA

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## EDUCATION

- 2015            Habilitation (HDR) in Computer Science: *Resource Management in Organizationally-Distributed Systems*; University of Warsaw, Poland.
- 2008            PhD in Computer Science: *Resource Management Models and Algorithms for Multi-Organizational Grids*  
Advisors: Franciszek Seredyński (PJIIT), Denis Trystram (INPG)
- 2004–2007      Institut National Polytechnique de Grenoble (INPG), École Nationale Supérieure d'Informatique et de Mathématiques Appliquées de Grenoble (ENSIMAG), France and Polish-Japanese Institute of Information Technology (PJIIT)  
Joint (*co-tutelle*) PhD studies; graduated with two PhD diplomas, a Polish and a French one.
- 2004            Master Thesis: *Data clustering algorithms*  
First class honors (*ocena celująca*). Second prize in the contest organized by the Polish Information Processing Society.  
Advisor: dr hab. Franciszek Seredyński
- 2002-2003      Universitat de Valencia, Spain, Faculty of Computer Science.  
Socrates-Erasmus European scholarship.
- 1998–2004      Warsaw University of Technology, Poland, Faculty of Electronics and Information Technology.

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## PROFESSIONAL EXPERIENCE

- 10.2017–current    Institute of Informatics, University of Warsaw, Poland: Associate Professor  
Principal Investigator in a 850k PLN (20k EUR) grant awarded by the Polish National Science Center on data center and HPC resource management (2018-2020).
- 10.2010–09.2017    Institute of Informatics, University of Warsaw, Poland: Assistant Professor  
Principal Investigator in a 350k PLN (80k EUR) grant awarded by the Polish National Science Center on scheduling and resource management (2013-2017).  
Principal Investigator in a 300k PLN (75k EUR) grant awarded by the Foundation for Polish Science on distributed storage systems (2011-2013).
- 10.2008–03.2010    Nanyang Technological University, Singapore: Research Fellow  
Postdoctoral training in Anwitaman Datta's team.
- 02.2004–09.2008    Polish-Japanese Institute of Information Technology (Warsaw, Poland): Teaching Assistant  
(leave of absence during stays in Grenoble, France: 09.2004-09.2005, 10.2006-09.2007)
- 02.2004–08.2004    Enabled Minds LLC (Warsaw, Poland and Portland, ME, USA): developer
- 03.2003–07.2003    LC Ingeniería (Valencia, Spain): Java/web developer (internship)

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## PRIZES, AWARDS AND SCHOLARSHIPS

- 2018–2020 National Science Center (Poland): Opus grant (UMO-2017/25/B/ST6/00116), Principal Investigator
- 05.2016 International Foundation for Autonomous Agents and Multiagent Systems (IFAAMAS): co-advisor of Piotr Skowron’s PhD thesis that won the runner-up of 2015 IFAAMAS Victor Lesser Distinguished Dissertation Award
- 01.2016–12.2017 Polish Ministry of Science and Higher Education: Polonium grant, coordinator (French-Polish cooperation programme; French coordinator: dr Fanny Pascual, LIP6, UPMC-Sorbonne Universités)
- 02.2015 Google Faculty Research Award: Principal Investigator
- 01.2014–12.2016 National Science Center (Poland): Preludium grant (UMO-2013/09/N/ST6/03661), tutor (Principal Investigator: Piotr Skowron)
- 07.2013–12.2017 National Science Center (Poland): Sonata grant (UMO-2012/07/D/ST6/02440), Principal Investigator
- 01.2012–12.2013 Polish Ministry of Science and Higher Education: Polonium grant, coordinator (French-Polish cooperation programme; French coordinator: prof. Denis Trystram, Grenoble University)
- 10.2011–09.2014 Polish Ministry of Science and Higher Education: scholarship for young researchers
- 05.2011–07.2013 Foundation for Polish Science: Homing Plus grant (HOMING PLUS/2010-2/13), Principal Investigator
- 10.2010–09.2011 University of Warsaw: Scholarship for young PhD researchers (Modern University Project)
- 2008 PJIIT: PhD thesis with first class honors
- 03.2007–07.2007 Égide PhD scholarship (granted by Égide, an agency of the French government)
- 10.2004–02.2007 French government fellowship recipient, *co-tutelle* PhD scholarship (*boursier du gouvernement français*)
- 2004 Procter & Gamble Best Polish Student Award: Winner of the competition for the best Polish graduate in 2004
- 2004 Polish Information Processing Society (2004): 2nd prize in the contest for the best computer science master thesis in Poland
- 10.2002–02.2003 European Socrates-Erasmus Scholarship (Universitat de Valencia, Spain)
- 10.1999–02.2003 Scholarship for exceptional academic achievements from Warsaw University of Technology.

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## GRANTS (PRINCIPAL INVESTIGATOR)

- 2018–2020 Optimization Methods for Allocation of Large-Scale Computational Resources  
Supported by the Polish National Science Center through a Opus grant.  
The objective of the project is to develop theoretically-sound and effective solutions in scheduling and resource management for large-scale computational resources — supercomputers and data centers.
- 07.2013–12.2017 Resource management for datacenters and supercomputers  
[mimuw.edu.pl/~krzadca/kassate/](http://mimuw.edu.pl/~krzadca/kassate/)  
Supported by the Polish National Science Center through a Sonata grant.  
The objective of the project is to develop mathematical models of resource management in modern computing systems; fair and efficient algorithms; and prototype implementations of the scheduling software.  
OStrich, a scheduler we developed for the SLURM supercomputer management software, is used by the Hydra supercomputer (262 nodes, 5056 cores) of the Warsaw academic supercomputer center (ICM) since July 2014.
- 05.2011–07.2013 Nebulostore: a p2p storage system  
[nebulostore.org](http://nebulostore.org)  
Supported by the Foundation for Polish Science through a Homing Plus grant.  
The goal of the project was to develop relevant theory, algorithms and a prototype implementation of an Internet-scale, peer-to-peer storage system suitable for various applications, including distributed online social networks.  
The project’s results include algorithms for multi-agent resource management (published at SPAA, IPDPSW and ACM TAAS); and a prototype implementation of the distributed data storage software.

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## TEACHING EXPERIENCE

### UNIVERSITY OF WARSAW, POLAND

Course: High Performance Computing (30 hours lectures, 30 hours labs), Master level

Lectured the course. Designed the curriculum. Prepared course materials.

Course: Parallel and Distributed Programming (30 hours lectures, 30 hours tutorials, 30 hours labs), Master level

Lectured the course. Redesigned and updated the curriculum. Prepared course materials.

Advising PhD students:

Co-advised Piotr Skowron’s PhD (defended in 2015 with distinction).

Advising Paweł Żuk (10.2017-)

Advising Master projects:

Supervised 17 defended MSc theses.

Taught tutorials and labs in the following undergraduate courses: Operating Systems, Security of Computer Systems, Computer Networks.

### INVITED LECTURES

Cooperation in Scheduling: Spring School on Algorithmic Game Theory (with Denis Trystram) (Université Sorbonne-Paris 6, June 2012)

NANYANG TECHNOLOGICAL UNIVERSITY, SINGAPORE

Co-supervised two final year projects of undergraduate students

INSTITUT NATIONAL POLYTECHNIQUE DE GRENOBLE, ÉCOLE NATIONALE SUPÉRIEURE DE GÉNIE INDUSTRIEL, FRANCE

Course: Systems and data bases (30 hours)

Course taught only as tutorials. Participated in syllabus preparation. Prepared course materials. Taught the course (in French).

POLISH-JAPANESE INSTITUTE OF INFORMATION TECHNOLOGY

Advised four defended BSc (final year) projects.

Taught tutorials and labs in the following undergraduate courses: Computer Networks, Advanced Computer Networks, Security of Information Systems, Operating Systems.

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## ENGAGEMENT FOR SCIENTIFIC COMMUNITY

### MEMBER OF TECHNICAL PROGRAM COMMITTEES

- Euro-Par: 2016, 2018 (resource management track co-chair)
- Supercomputing (SC): 2016, 2017, 2019
- IEEE International Parallel & Distributed Processing Symposium (IPDPS): 2013, 2014, 2016, 2019
- International Joint Conference on Artificial Intelligence (IJCAI): 2015, 2016, 2017
- AAAI Conference on Artificial Intelligence: 2018
- International Conference on Parallel Processing (ICPP): 2017
- IEEE International Conference on High Performance Computing (HiPC): 2013, 2014, 2015, 2016
- Workshop on Scheduling For Parallel Computing (SPC), in conjunction with the International Conference on Parallel Processing and Applied Mathematics PPAM: 2013, 2015, 2017
- BeyondMR / Scalable Workflow Enactment Engines and Technologies (SWEET), in conjunction with SIGMOD: 2013, 2014, 2016, 2017, 2018
- IEEE GLOBECOM: 2015
- IEEE Consumer Communications & Networking Conference (CCNC), Peer-to-Peer Networking and Content Distribution track: 2012, 2013
- International Workshop on Hot Topics in Peer-to-Peer Systems (organized with IEEE International Parallel & Distributed Processing Symposium, IPDPS): 2009, 2010, 2011
- International Conference on Peer-to-Peer Computing (P2P): 2009

### REVIEWER FOR GRANT PROPOSALS

- Engineering and Physical Sciences Research Council (UK)
- Agence National de la Recherche (France)
- IDEX Université Grenoble Alpes (France)
- National Science Center (Poland)

### REVIEWER FOR JOURNALS

IEEE Transactions on Parallel and Distributed Systems, IEEE Intelligent Systems, IEEE Transactions on Cybernetics, IEEE Transactions on Mobile Computing, IEEE Transactions on Computers, ACM Transactions on Autonomous and Adaptive Systems, IEEE Transactions on Industrial Electronics, Concurrency & Computation: Practice and Experience, Journal of Parallel and Distributed Computing (Springer),

Journal of Scheduling (Springer), Peer-to-Peer Networking and Applications (Springer), Future Generation Computer Systems (Elsevier), Quarterly Journal of Operations Research (Springer), Distributed and Parallel Databases (Springer), Electronic Commerce Research and Applications (Elsevier), The Institute of Electronics, Information and Communication Engineers (IEICE) Transactions, Computers&Operations Research (Elsevier), Information Processing Letters (Elsevier), Information Sciences (Elsevier), Fundamenta Informaticae, Parallel Processing Letters

#### REVIEWER FOR CONFERENCES

EuroPar 2005, HiPC 2005, SBAC 2005, IFIP 2005, IFIP 2006, GPC 2007, WCCI 2008, P2P 2008, SocInfo 2009, SPAA 2009, HotP2P 2009, P2P 2009, CCNC 2010, HotP2P 2010, ICDCS 2010, AINA 2011, HotP2P 2011, CCNC 2012, Euro-Par 2012, CCNC 2013, IPDPS 2013, PST 2013, SPT 2013, SWEET 2013, IPDPS 2014, HIPC 2014, IPDPS 2015, Euro-Par 2015, IJCAI 2015, HiPC 2015, IPDPS 2016.

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#### PUBLICATIONS

##### REFEREED JOURNALS

Pascual, F. and Rządca, K. (2018). Colocating tasks in data centers using a side-effects performance model. *European Journal of Operational Research*, 268(2):450–462

Skowron, P., Rządca, K., and Datta, A. (2017). Cooperation and competition when bidding for complex projects: Centralized and decentralized perspectives. *IEEE Intelligent Systems*, 32(1):17–23

Skowron, P. and Rządca, K. (2016). Flexible replica placement for optimized p2p backup on heterogeneous, unreliable machines. *Concurrency and Computation: Practice and Experience*, 28(7):2166–2186

Rządca, K., Datta, A., Kreitz, G., and Buchegger, S. (2015). Game-theoretic mechanisms to increase data availability in decentralized storage systems. *ACM Transactions on Autonomous and Adaptive Systems*, 10(3):14:1–14:32

Xin, L., Datta, A., and Rządca, K. (2013). Trust beyond reputation: A computational trust model based on stereotypes. *Electronic Commerce Research and Applications*, 12:24–39

Dutot, P.-F., Pascual, F., Rządca, K., and Trystram, D. (2011). Approximation algorithms for the multi-organization scheduling problem. *IEEE Transactions on Parallel and Distributed Systems*, 22:1888–1895

Rządca, K., Tan Teck, J., and Datta, A. (2010b). Multi-objective optimization of multicast overlay for collaborative applications. *Computer Networks*, 54(12):1986–2005

Pascual, F., Rządca, K., and Trystram, D. (2009). Cooperation in multi-organization scheduling. *Concurrency&Computation: Practice and Experience*, 21:905–921

Rządca, K. and Trystram, D. (2009). Promoting cooperation in selfish computational grids. *European Journal of Operational Research*, 199:647–657

##### REFEREED BOOK CHAPTERS

Datta, A., Buchegger, S., Vu, L.-H., Thornsten, S., and Rządca, K. (2011). Decentralized online social networks. In Furht, B., editor, *Handbook of Social Network Technologies and Applications*, pages 349–378. Springer

Hupa, A., Rządca, K., Wierzbicki, A., and Datta, A. (2010). Interdisciplinary matchmaking: Choosing collaborators by skill, acquaintance and trust. In Abraham, A., Hassanien, A.-E., and Snasel, V., editors, *Computational Social Network Analysis*, Computer Communication and Networks, pages 319–347. Springer

Datta, A., Rządca, K., Ang, S., and Hong, G. C. (2010). Serverless social software for nomadic collaboration. In Murugan, A., editor, *e-Research Collaboration: Theory, Techniques and Challenges*, pages 85–103. Springer, New York Dordrecht Heidelberg London

Wierzbicki, A., Datta, A., Zaczek, L., and Rządca, K. (2010). Supporting collaboration and creativity through mobile p2p computing. In Shen, X., Yu, H., Buford, J., and Akon, M., editors, *Handbook of Peer-to-Peer Networking*, pages 1367–1400. Springer

Dutot, P.-F., Rządca, K., Saule, E., and Trystram, D. (2009). Multi-objective scheduling. In Robert, Y. and Vivien, F., editors, *Introduction to Scheduling*, Computational Science, pages 219–251. Chapman & Hall/CRC

#### REFEREED CONFERENCE PROCEEDINGS

Pascual, F., Rządca, K., and Skowron, P. (2018). Collective schedules: Scheduling meets computational social choice. In *AAMAS’18*, pages 667–675. IFAAMAS (25% acceptance ratio)

Pacholczyk, M. and Rządca, K. (2018). Fair non-monetary scheduling in federated clouds. In *Cross-Cloud’18: 5th Workshop on CrossCloud Infrastructures & Platforms, EuroSys’18 Workshops*, pages 3:1–3:6. ACM

Theron, P., Kott, A., Drašar, M., Rządca, K., LeBlanc, B., Pihelgas, M., Mancini, L., and Panico, A. (2018). Towards an active, autonomous and intelligent cyber defense of military systems: The NATO AICA reference architecture. In *2018 International Conference on Military Communications and Information Systems (ICMCIS)*, pages 1–9. IEEE

Janus, P. and Rządca, K. (2017). SLO-aware colocation of data center tasks based on instantaneous processor requirements. In *ACM SoCC’17, ACM Symposium on Cloud Computing*, pages 256–268. ACM (23.6% acceptance ratio)

Pascual, F. and Rządca, K. (2017). Optimizing egalitarian performance in the side-effects model of colocation for data center resource management. In *Euro-Par 2017 Proceedings*, volume 10417 of *LNCS*, pages 206–219. Springer (28.4% acceptance ratio)

Milka, G. and Rządca, K. (2017). Dfuntest: A testing framework for distributed applications. In *PPAM 2017, International Conference on Parallel Processing and Applied Mathematics*, volume 10777 of *LNCS*. Springer

Skowron, P. and Rządca, K. (2015). Geographically distributed load balancing with (almost) arbitrary load functions. In *HiPC 2015, 22nd IEEE/ACM International Conference on High Performance Computing*. IEEE (25% acceptance ratio)

Pascual, F. and Rządca, K. (2015). Partition with side effects. In *HiPC 2015, 22nd IEEE/ACM International Conference on High Performance Computing*. IEEE (25% acceptance ratio)

Georgiou, Y., Glesser, D., Rządca, K., and Trystram, D. (2015). A scheduler-level incentive mechanism for energy efficiency in HPC. In *CCGrid 2015, 15th IEEE/ACM International Symposium on Cluster, Cloud and Grid Computing*, pages 617–626 (25.7% acceptance ratio)

Skowron, P., Rządca, K., and Datta, A. (2014). People are processors: Coalitional auctions for complex projects (extended abstract). In *AAMAS 2014, 13th International Conference on Autonomous Agents and Multiagent Systems*, pages 1525–1526

Skowron, P. and Rządca, K. (2014). Fair share is not enough: measuring fairness in scheduling with cooperative game theory. In *PPAM 2013, International Conference on Parallel Processing and Applied Mathematics*, volume 8385 of *LNCS*, pages 38–48. Springer

- Emeras, J., Pinheiro, V., Rządca, K., and Trystram, D. (2014). Ostrich: Fair scheduling for multiple submissions. In *PPAM 2013, International Conference on Parallel Processing and Applied Mathematics*, volume 8385 of *LNCS*, pages 26–37. Springer
- Skowron, P. and Rządca, K. (2013c). Non-monetary fair scheduling — a cooperative game theory approach. In *SPAA 2013, 25th ACM Symposium on Parallelism in Algorithms and Architectures*, pages 288–297. ACM (24% acceptance ratio)
- Skowron, P. and Rządca, K. (2013b). Network delay-aware load balancing in selfish and cooperative distributed systems. In *HCW 2013, 22st International Heterogeneity in Computing Workshop (in conjunction with IPDPS 2013)*, IPDPSW, pages 7–18. IEEE
- Skowron, P. and Rządca, K. (2013a). Exploring heterogeneity of unreliable machines for p2p backup. In *HPCS 2013, International Conference on High Performance Computing & Simulation*, pages 91–98. IEEE
- Pinheiro, V., Rządca, K., and Trystram, D. (2012). Campaign scheduling. In *IEEE International Conference on High Performance Computing (HiPC), Proceedings*, pages 1–10
- Rządca, K., Datta, A., and Buchegger, S. (2010a). Replica placement in p2p storage: Complexity and game theoretic analyses. In *ICDCS 2010, The 30th International Conference on Distributed Computing Systems, Proceedings*, pages 599–609. IEEE Computer Society (14% acceptance ratio)
- Ang, S., Rządca, K., and Datta, A. (2010). Sharedmind: A tool for collaborative mind-mapping. In *Multimedia and Expo (ICME), 2010 IEEE International Conference on*, pages 1154–1155. IEEE
- Xin, L., Datta, A., Rządca, K., and Ee-Peng, L. (2009). Stereotrust: A group based personalized trust model. In *CIKM 2009, The 18th ACM Conference on Information and Knowledge Management, Proceedings*, pages 7–16. ACM Press (14% acceptance ratio)
- Rządca, K., Yong, J. T. T., and Datta, A. (2009). Multicast trees for collaborative applications. In *9th IEEE/ACM International Symposium on Cluster Computing and the Grid, Proceedings*, pages 60–67. IEEE Computer Society (21% acceptance ratio)
- Kaszuba, T., Rządca, K., and Wierzbicki, A. (2008). Discovering the most trusted agents without central control. In *Embedded and Ubiquitous Computing, IEEE/IFIP International Conference on*, volume 2, pages 616–621. IEEE Computer Society
- Krystek, M., Kurowski, K., Oleksiak, A., and Rządca, K. (2008). Comparison of centralized and decentralized scheduling algorithms using gssim simulation environment. In Sergei Gorlatch, P. F. and Priol, T., editors, *Grid Computing: Achievements and Prospects*, pages 185–196. Springer
- Rządca, K. (2007). Scheduling in multi-organization grids: Measuring the inefficiency of decentralization. In *PPAM 2007 Proceedings*, number 4967 in *LNCS*, pages 1048–1058. Springer
- Pascual, F., Rządca, K., and Trystram, D. (2007). Cooperation in multi-organization scheduling. In *Euro-Par 2007 Proceedings*, volume 4641 of *LNCS*, pages 224–233. Springer. Conference version of [Pascual et al., 2009] (27% acceptance ratio)
- Rządca, K., Trystram, D., and Wierzbicki, A. (2007). Fair game-theoretic resource management in dedicated grids. In *IEEE International Symposium on Cluster Computing and the Grid (CCGRID 2007), Proceedings*. IEEE Computer Society (33% acceptance ratio)
- Roelblitz, T. and Rządca, K. (2006). On the placement of reservations into job schedules. In *Euro-Par 2006 Proceedings*, volume 4128 of *LNCS*, pages 198–210. Springer (38% acceptance ratio)

Rzadca, K. and Trystram, D. (2006). Brief announcement: Promoting cooperation in selfish grids. In *SPAA 2006 (Annual ACM Symposium on Parallelism in Algorithms & Architectures) Proceedings*, page 332. ACM Press. Conference version of [Rzadca and Trystram, 2009]

Wojtyła, G., Rzadca, K., and Seređynski, F. (2006). Artificial immune systems applied to multiprocessor scheduling. In *PPAM 2005 Proceedings*, volume 3911 of *LNCS*, pages 904–911. Springer

Rzadca, K. (2006). Evaluating the quality of maximum variance cluster algorithms. In *ICCVG 2004 (International Conference on Computer Vision and Graphics) Proceedings*, volume 32 of *Computational Imaging and Vision*, pages 981–986. Springer

Rzadca, K. and Seređynski, F. (2005). Heterogeneous multiprocessor scheduling with differential evolution. In *IEEE CEC 2005 (Congress of Evolutionary Computation) Proceedings*, pages 2840–2847. IEEE Computer Society

Rzadca, K. and Ferri, F. (2003). Incrementally assessing cluster tendencies with a maximum variance cluster algorithm. In *IbPRIA (Iberian Conference on Pattern Recognition and Image Analysis) Proceedings*, volume 2653 of *LNCS*, pages 868–875. Springer