



# dr. ir. Joaquin Vanschoren

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<https://joaquinvanschoren.github.io>

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## Professional Profile

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My passion is to empower everyone to truly understand and use machine learning. My research focuses on automating machine learning, as well as making it open and collaborative. I founded OpenML.org, a popular online machine learning platform where people can share data, code, models and experiments, and I develop algorithms that learn from all these experiments to help people build better machine learning models, faster.

## Professional Experience

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- **Eindhoven University of Technology**
  - **Assistant Professor** in Machine Learning (Tenured) Jan 2014 - now
- **CityLife (now Joyn)**
  - **Data Scientist** on large-scale recommender systems. 150,000+ users. Jan 2013 - Dec 2013
- **Leiden University**
  - **Post-doctoral Fellow and Lecturer**, Data Mining Sep 2010 - Sept 2013
- **University of Leuven**
  - **Post-doctoral Fellow**. Computer Science Department. May 2010 - Sep 2010
  - **PhD Candidate**. Computer Science Department. Aug 2005 - May 2010

## Education and Degrees

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- **PhD in Engineering**, *University of Leuven, Belgium* 17 May 2010
  - PhD thesis: “Understanding Machine Learning Performance with Experiment Databases”
- **Master in Engineering: Computer Science**, *University of Leuven, cum laude* 8 July 2005
  - Master’s thesis: “Development of a framework for high-level perception”, magna cum laude
- **High school education**
  - Sint Jan Berchmansinstituut Zonhoven: Latin-Mathematics 1995-1999
  - Vrije Middenschool Zonhoven: Latin 1993-1995

## References

Recommendations can also be found at <http://www.linkedin.com/in/jvanschoren>

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- **Prof. dr. Mykola Pechenizkiy**, Eindhoven University of Technology.  
Phone: +31 40 247 26 02, e-mail: m.pechenizkiy@tue.nl
- **Prof. dr. ir. Hendrik Blockeel**, University of Leuven, Belgium  
Phone: +32 16 32 76 43, e-mail: hendrik.blockeel@cs.kuleuven.be

## Professional Skills

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- **Programming languages:** Python, R, Java, PHP, Javascript
- **Languages:** English (proficient), Dutch (native), Spanish (native), French (fluent), German (basic)
- **Technologies:** Machine learning algorithms and systems (including deep learning), MapReduce/Spark, Web technology, Databases, Semantic Web
- **Software development:** Data structures, Algorithms, Design patterns. Agile, Scrum, Git. Open source development (OpenML), production-level recommender systems (CityLife app)
- **Leadership:** Research project leader, Open source project lead, PhD/MSc Supervisor, Conference chair.
- **Speaking and authorship:** University lecturer, (invited) speaker at many international conferences and workshops. Author of many scientific publications, book chapters, grant applications and project reports.

## Awards

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- Microsoft Azure Research Award, July 2016 + July 2017
- Dutch Data Prize, Research Data Netherlands, Nov 2016
- Best Demo Award, 17th European Conference on Machine Learning (ECML-PKDD), 2009

## Grants

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- NWO Commit2Data on Evolutionary data €854,045, Jul 2017
  - ‘Dynamic Data Analytics through Automatically Constructed Machine Learning Pipelines’
- DARPA Data Driven Discovery of Models, €324,000, Apr 2017
  - ‘AutoFlow: Automatic Workflow Construction and Optimization’
- Microsoft Azure Research Award, €40,000, Sep 2016-2017
  - ‘A Cloud-Based Platform for Automated Machine Learning’, Principal Investigator
- Dutch Science Foundation (NWO) Free Competition research grant, €240,000, Sep 2012 - Sep 2016
  - ‘Massively Collaborative Data Mining’, Principal Investigator
- EU PASCAL Harvest grant, €30,000, Aug 2012 - Feb 2013
  - ‘MLOpen Machine Learning Platform’, Principal Investigator

## Selected Invited Talks

Videos available on <https://joaquinvanschoren.github.io>

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- National eScience Symposium, Amsterdam, The Netherlands, Oct 2017
- ICML Workshop on Reproducible Machine Learning, Sydney, Australia, Aug 2017
- Amazon Research, Berlin, Germany and Cambridge, UK, Feb-Apr 2017
- NIPS Workshop on Challenges in Machine Learning (CiML), Barcelona, Spain, Dec 2016
- IBM Watson Research Center, New York, USA, Jun 2016
- Heavy Flavour Physics Data Mining workshop, Zurich, Switzerland, Feb 2016
- Open Data Science @ Sheffield workshop, Sheffield, UK, Dec 2015
- Intelligent Data Analysis 2015 (IDA), Horizon Talk, St Etienne, France, Oct 2015
- Statistical Computing (StatComp) Keynote, Ulm, Germany, Jul 2015
- ICML AutoML Workshop, Lille, France, Jul 2015
- European Conference on Data Analysis (ECDA) Keynote, Bremen, Germany, Jul 2014
- SIS Classification and Data Analysis Group Conference (CLADAG), Modena, Italy, Sep 2013

## Society Membership

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- OpenML steering committee member, Mar 2017 - ...
- Co-chair of the W3C ML-Schema Community Group, Oct 2015 - ...
- Senior member of the Dutch School for Information and Knowledge Systems (SIKS), Jan 2014 - ...

## Academic Supervision

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### Doctoral Advisor for PhD Students

- Chris Wendler, Automatic Machine Learning on Evolving Data Streams, TU Eindhoven, 2018-...
- Pieter Gijsbers, Automatic Machine Learning Pipeline Synthesis, TU Eindhoven, 2017-...
- Chao Zhang, e-Coaching in Continuous Personal Health, TU Eindhoven, 2015-...
- Rafael Mantovani, Using Meta-learning for Hyperparameter Tuning, University of Sao Paolo, 2014-...
- Jan van Rijn, Massively Collaborative Machine Learning, Leiden University, 2012-2016

### PDEng Thesis supervision (Professional Doctorates)

- Karthik Srinivasan, PDEng, Preventing Burglaries and Other Incidents, TU Eindhoven, 2014-2015.

## Selected Teaching Activities

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### University Courses:

- Data Mining, Jheronimus Academy of Data Science (JADS), The Netherlands (2016 - ...)
  - Responsible lecturer. 1st year Bachelor. Evaluation: 80% (teaching), 84% (course)
- Foundations of Data Mining, Eindhoven University of Technology, The Netherlands (2015 - ...)
  - Responsible lecturer. 1st year Master. Evaluation: 75% (teaching), 78% (course)
- Web Technology, Eindhoven University of Technology, The Netherlands (2014 - 2018)
  - Responsible lecturer. 2nd year Bachelor. Evaluation: 72% (teaching), 69% (course)
- SINTEF Geilo Winter School, Norway (2017). 128 students.

### Conference Tutorials:

- Automatic Machine Learning (ECMLPKDD, 2017)
- Connecting R to the Machine Learning Platform OpenML (UseR, 2017)
- Meta-learning and Algorithm Selection (ECMLPKDD, 2015)
- Meta-learning and Algorithm Selection (ECAI, 2014)

## Selected Academic Community Activities

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### Conference organization

- Associate Chair (Industry Track), BeNeLearn 2017, Eindhoven, The Netherlands
- Workshop Chair, Automatic Machine Learning at ICML 2017, ECMLPKDD 2017, ICML 2016
- General Chair, Learning and Intelligent OptimizatioN Conference (LION 2016), Ischia, Italy
- Workshop Chair, Meta-Learning and Algorithm Selection at ECMLPKDD 2015, ECAI 2014
- Associate Chair (Demo track), European Conference on Machine Learning (ECMLPKDD 2013)
- Program Chair, BeNeLearn 2010-2011, The Hague - Leuven

### Refereeing

- Programme Committee member: NIPS 2016-2017, ECML-PKDD 2012-2017, ECAI 2014-2016, KDD 2016, LION 2016, IJCNN 2015, IJCAI 2015, ESWC 2011-2015
- Journal referee: Machine Learning Journal (MLJ), Journal of Machine Learning Research (JMLR), Data Mining and Knowledge Discovery (DaMi), Semantic Web Journal (SWJ)

### Other interests

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Triathlon, Marathon running, Photography (published), Improvisational theater

## Publications

All full texts available on <http://www.win.tue.nl/~jvanscho>(\*: Joint first author, **bold**: 25+ citations)

## Refereed Articles (Journal and Conference papers)

1. van Rijn, J.N., Holmes, G., Pfahringer, B., Vanschoren, J. (2017) The online performance estimation framework: Heterogeneous Ensemble Learning for Data Streams. *Machine Learning*, 107 (1), 149-176.
2. Olier, I., Sadawi, N., Bickerton, G.R., Vanschoren, J., Grosan, C., Soldatova, L., King, R.D. (2017) Meta-QSAR: learning how to learn QSARs. *Machine Learning*, 107 (1), 285-311.
3. Abdulrahman, S., Brazdil, P., van Rijn, J.N., Vanschoren, J. (2017) Speeding up Algorithm Selection via Meta-learning and Active Testing. *Machine Learning*, 107 (1), 79-108.
4. Gijsbers, P., Vanschoren, J., Olson, R. (2017) Layered TPOT: Speeding up Tree-based Pipeline Optimization. ECML 2017 Workshop on Automatic Selection, Configuration and Composition of Machine Learning Algorithms (AutoML 2017). CEUR Workshop Proceedings; vol. 1998.
5. Casalicchio, G., Hofner, B., Lang, M., Kirchhoff, D., Kerschke, P., Seibold, H., Bossek, J., Vanschoren, J., Bischl, B. (2017) OpenML: An R Package to Connect to the Networked Machine Learning Platform. *Computational Statistics* 32 (3), 1-15
6. Mantovani, R.G., Horvath, T., Cerri, R., Carvalho, A.P.L.F., Vanschoren, J. (2016) Hyper-parameter Tuning of a Decision Tree Induction Algorithm, *Brazilian Conference on Intelligent Systems (BRACIS 2016)*
7. Eerikainen, L.M., Vanschoren, J., Rooijakkers, M.J., Vullings, R., Aarts, R.M. (2016) Reduction of false arrhythmia alarms using signal selection and machine learning. *Physiological Measurement*, 37 (8), 1204-1216
8. **Bischl, B., Kerschke, P., Kotthoff, L., Lindauer, M., Malitsky, Y., Frechette, A., Hoos, H., Hutter, F., Leyton-Brown, K., Tierney, K., Vanschoren, J. (2016) ASlib: A Benchmark Library for Algorithm Selection. *Artificial Intelligence*, 237, 41-58**
9. Gao, B., Berendt, B. and Vanschoren, J. (2016) Towards understanding online sentiment expression. An interdisciplinary approach with subgroup comparison and visualization. *Social Network Analysis and Mining*, 6 (1), 68:1-68:16
10. van Rijn, J.N., Abdulrahman, S.M., Brazdil, P. and Vanschoren, J. (2016) On the Evaluation of Algorithm Selection Problems. *Machine Learning Conference of Belgium and The Netherlands*, 1-2.
11. van Rijn, J.N., Holmes, G., Pfahringer, B., Vanschoren, J. (2015) Having a Blast: Meta-Learning and Heterogeneous Ensembles for Data Streams. *IEEE Proceedings of ICDM 2015*, 1003-1008.
12. Vanschoren, J., Bischl, B., Hutter, F., Sebag, M., Kegl, B., Schmid, M., Napolitano, G., Wolstencroft, K., Williams, A.R., and Lawrence, N (2015) Towards a Data Science Collaboratory. *Lecture Notes in Computer Science (IDA 2015)*, 9385, XIX-XXI
13. van Rijn, J.N., Abdulrahman, S.M., Brazdil, P. and Vanschoren, J. (2015) Fast Algorithm Selection Using Learning Curves. *Lecture Notes in Computer Science (IDA 2015)*, 9385, 298-309
14. Eerikainen, L.M., Vanschoren, J., Rooijakkers, M.J., Vullings, R., Aarts, R.M. (2015) Decreasing the False Alarm Rate of Arrhythmias in Intensive Care Using a Machine Learning Approach. *IEEE Computing in Cardiology*, 42, 293-297
15. Vanschoren, J., van Rijn, J.N. and Bischl, B. (2015) Taking machine learning research online with OpenML. *JMLR Workshop and Conference Proceedings (BigMine 2015)*, 41, 1-4.
16. van Rijn, J.N., Holmes, G., Pfahringer, B., Vanschoren, J. (2015) Case Study on Bagging Stable Classifiers for Data Streams. *Machine Learning Conference of Belgium and The Netherlands*, 1-6.
17. Gao, B., Berendt, B. and Vanschoren, J. (2015) Who is more positive in private? Analyzing sentiment differences across privacy levels and demographic factors in Facebook chats and posts. *IEEE/ACM Proceedings of ASONAM 2015*, 605-610
18. Mantovani, R.G., Rossi, A.D.L, Vanschoren, J., Bischl, B., Carvalho A.C.P.L.F. (2015) To tune or not to tune: recommending when to adjust SVM hyper-parameters via Meta-learning. *IEEE Proceedings of the International Joint Conference on Neural Networks (IJCNN 2015)*, 1-8
19. Mantovani, R.G., Rossi, A.D.L, Vanschoren, J., Bischl, B., Carvalho A.C.P.L.F. (2015) Effectiveness of Random Search in SVM hyper-parameter tuning. *IEEE Proceedings of the International Joint Conference on Neural Networks (IJCNN 2015)*
20. van Rijn, J.N., Holmes, G., Pfahringer, B. and Vanschoren, J. (2014) Algorithm Selection on Data Streams. *Lecture Notes in Computer Science (Discovery Science)*, 8777, 325-336.

21. Vanschoren, J., van Rijn, J.N., Bischl, B. and Torgo, L. (2013) OpenML: networked science in machine learning. *ACM SIGKDD Explorations*, 15 (2), 49-60.
22. van Rijn, J., Bischl, B., Torgo, L., Gao, B., Umaashankar, V., Fischer, S., Winter, P., Wiswedel, B., Berthold, M.R., and Vanschoren, J. (2013) OpenML: A Collaborative Science Platform. *Lecture Notes in Computer Science (ECML PKDD 2013)*, 8190, 645-649
23. Vanschoren, J., Braun, M. and Ong, C.S. (2013) Open science in machine learning. *Proceedings of CLADAG 2013*, 462-465. ISBN: 9788867871179
24. van Rijn, J., Umaashankar, V., Fischer, S., Bischl, B., Torgo, L., Gao, B., Winter, P., Wiswedel, B., Berthold, M.R., and Vanschoren, J. (2013) A RapidMiner extension for Open Machine Learning. *Proceedings of RCOMM 2013*, 59-70. ISBN: 978-3-8440-2145-5
25. Serban, F.\*, Vanschoren, J.\*, Kietz, J.U. and Bernstein, A. (2012) A Survey of Intelligent Assistants for Data Analysis. *ACM Computing Surveys*, 45 (3), Art. 31
26. Vanschoren, J., Blockeel, H., Pfahringer, B. and Holmes, G. (2012) Experiment Databases: A new way to share, organize and learn from experiments. *Machine Learning*, 87(2), 127-158
27. Reutemann, P., Vanschoren, J. (2012) Scientific Workflow Management with ADAMS. *Lecture Notes in Computer Science (ECML PKDD 2012)*, 7524, 833-837
28. Vespi er, U., Knobbe, A.J., Nijssen, S., Vanschoren, J. (2012) MDL-Based Analysis of Time Series at Multiple Time-Scales. *Lecture Notes in Computer Science (ECML PKDD 2012)*, 7524, 371-386
29. Leite, R., Brazdil P., Vanschoren, J. (2012) Selecting Classification Algorithms with Active Testing. *Lecture Notes in Computer Science (MLDM 2012)*, 7376, 117-131
30. Gao, B. and Vanschoren, J. (2011) Visualizations of Machine Learning Behavior with Dimensionality Reduction Techniques. *Machine Learning Conference of Belgium and The Netherlands*, 35-42.
31. Vespi er, U., Knobbe, A., Vanschoren, J., Miao, S., Koopman, A., Obladen, B., and Bosma, C. (2011) Traffic Events Modeling for Structural Health Monitoring. *Lecture Notes in Computer Science (IDA 2011)*, 7014, 276-387
32. Vanschoren, J., Soldatova, S. (2010). Expos e: An Ontology for Data Mining Experiments. *Workshop on Third Generation Data Mining at ECML PKDD 2010*, 31-46.
33. Vanschoren, J., Blockeel, H. (2009). A community-based platform for machine learning experimentation. *Lecture Notes In Computer Science (ECML-PKDD 2009)*, 5782, 750-754 - Best demo award
34. Vanschoren, J., Pfahringer, B., Holmes, G. (2008). Learning from the past with experiment databases. *Lecture Notes in Artificial Intelligence (PRICAI 2008)*, 5351, 485-496
35. Vanschoren, J., Blockeel, H., Pfahringer, B., Holmes, G. (2008). Organizing the world's machine learning information. *Comm. in Computer and Information Science (ISOLA 2008)*, 17, 693-708
36. Vanschoren, J. (2008). Experiment databases for machine learning. *NIPS Workshop on Machine Learning Open Source Software at NIPS 2008*.
37. Vanschoren, J., Blockeel, H. (2008). Investigating classifier learning behavior with experiment databases. *Data Analysis, Machine Learning and Applications (GfKL 2007)*, 421-428
38. Blockeel, H.\*, Vanschoren, J.\* (2007). Experiment databases: Towards an improved experimental methodology in machine learning. *Lecture Notes in Computer Science (ECML 2007)*, 4702, 6-17. (Best Demo Award)
39. Vanschoren, J., Van Assche, A., Vens, C., Blockeel, H. (2007). Meta-learning from experiment databases: An illustration. *Machine Learning Conference of Belgium and The Netherlands*, 120-127.
40. Vanschoren, J., Blockeel, H. (2006). Towards understanding learning behavior. *Machine Learning Conference of Belgium and The Netherlands*, 89-96.

#### Refereed Workshop Articles and Abstracts

41. Gijsbers, P., Vanschoren, J., Olson, R.S. (2017) Layered TPOT: Speeding up Tree-based Pipeline Optimization. *Proceedings of the 2017 ECMLPKDD AutoML Workshop*.
42. Lawrynowicz, A., Esteves, D., Panov, P., Soru, T., D zeroski, S., Vanschoren, J (2016) An Algorithm, Implementation and Execution Ontology Design Pattern. *ISWC Workshop on Ontology and Semantic Web Patterns: 1-12*
43. Bernard, H. F., Heinrich, A., Vanschoren, J. (2016) Improved driver sleepiness prediction with CASH. *European Data Forum 2016*.
44. Zhang, C., van Wissen, A., Lakens, D., Vanschoren, J., de Ruyter, B.E.R., IJsselsteijn, W.A. (2016) Anticipating habit formation: a psychological computing approach to behavior change support. *UbiComp Adjunct 2016*: 1247-1254
45. Bischl, B., Bossek, J., Casalicchio, G., Hofner, B., Kerschke, P., Kirchhoff, D., Lang, M., Seibold, H.,

- Vanschoren, J. (2016) Connecting R to the OpenML project for Open Machine Learning. *useR Conference 2016*.
46. Abdulrahman, S, Brazdil, P., van Rijn, J.N., Vanschoren, J. (2015) Algorithm Selection via Meta-learning and Sample-based Active Testing. *CEUR Workshop Proceedings (ECMLPKDD 2015 Workshop on Metalearning and Algorithm Selection)*, 1455, 55-66
  47. Mantovani, R.G., Rossi, A.L.D., Vanschoren, J., Carvalho, A.C.P.L.F. (2015) Meta-learning Recommendation of Default Hyper-parameter Values for SVMs in Classification Tasks. *CEUR Workshop Proceedings (ECMLPKDD 2015 Workshop on Metalearning and Algorithm Selection)*, 1455, 80-92
  48. van Rijn, J.N., Vanschoren, J. (2015) Sharing RapidMiner Workflows and Experiments with OpenML. *CEUR Workshop Proceedings (ECMLPKDD 2015 Workshop on Metalearning and Algorithm Selection)*, 1455, 93-103
  49. Vukicevic, M., Radovanovic, S., Vanschoren, J., Napolitano, G., Delibasic, B. (2015) Towards a Collaborative Platform for Advanced Meta-Learning in Healthcare Predictive Analytics. *CEUR Workshop Proceedings (MetaSel @ ECMLPKDD 2015)*, 1455, 112-114
  50. Knobbe A.J., Meeng M. Vanschoren J., Rees Jones S., Merlo Penning S. (2015) Reconstructing Medieval Social Networks from English and Latin Charters. *Population Reconstruction 2014*
  51. van Rijn, J.N., Holmes, G., Pfahringer, B. and Vanschoren, J. (2014) Towards Meta-learning on Data Streams. *Workshop on Meta-learning and Algorithm Selection CEUR Workshop Proceedings (MetaSel @ ECMLPKDD 2014)*, 1201, 37-38.
  52. van Rijn, J. and Vanschoren, J. (2013) OpenML: An Open Science Platform for Machine Learning. *Machine Learning Conference of Belgium and The Netherlands*, 99-100.
  53. Vanschoren, J. (2012). The Experiment Database for Machine Learning. *CEUR Workshop Proceedings (ECAI 2012 Workshop on Planning to Learn)*, 950, 30-37.
  54. Vespier, U., Knobbe, A., Nijssen, S., Vanschoren, S. (2012). MDL-Based Identification of Relevant Temporal Scales in Time Series. *Workshop on Information Theoretic Methods in Science and Engineering, WITMSE 2012*.
  55. Miao, S., Knobbe, A., Vanschoren, J., Vespier, U., Koopman, A., Cachucho, R., Chen, X. (2011). A Range of Data Mining Techniques to Correlate Multiple Sensor Types. *Dutch-Belgian Database Day*, Art.5.
  56. Vanschoren, J., Soldatova, S. (2010). Collaborative Meta-Learning. *Planning to Learn workshop at ECAI 2010*, 37-46.
  57. Vanschoren, J., Blockeel, H. (2009). Stand on the shoulders of giants: towards a portal for collaborative experimentation in data mining. *3rd Generation DM Workshop, ECML PKDD '09*, 88-99
  58. Vanschoren, J., Blockeel, H., Pfahringer, B., Holmes, G. (2008). Organizing the world's machine learning information. *Workshop on Third Generation Data Mining at ECML PKDD 2008*.
  59. Vanschoren, J., Blockeel, H., Pfahringer, B., Holmes, G. (2008). Experiment databases: Creating a new platform for meta-learning research. *Planning to Learn Workshop, ICML 2008*, 10-15.

### Books and proceedings edited

60. Hutter, F., Kotthoff, L., Vanschoren, J., (Eds.): Automatic Machine Learning 2016. Proceedings of the ICML Workshop on Automatic Machine Learning, *Proceedings of Machine Learning Research*, 64.
61. Festa, P., Sellmann, M., Vanschoren, J., (Eds.): Learning and Intelligent Optimization 2016, Proceedings of the 10th International Conference, LION 10, Ischia Island, Italy, *Lecture Notes in Computer Science*, 10079, Springer.
62. Vanschoren, J., Brazdil, P., Soares, C., Kotthoff, L. (Eds.): Meta-learning and Algorithm Selection 2015. Proceedings of the ECMLPKDD Workshop on Meta-learning and Algorithm Selection, *CEUR Workshop Proceedings*, 1455 (2015). Online CEUR-WS.org/Vol-1455.
63. Vanschoren, J., Brazdil, P., Soares, C., Kotthoff, L. (Eds.): Meta-learning and Algorithm Selection 2014. Proceedings of the ECMLPKDD Workshop on Meta-learning and Algorithm Selection, *CEUR Workshop Proceedings*, 1201 (2014). Online CEUR-WS.org/Vol-1201.
64. Vanschoren, J., Brazdil, P., Kietz, J-U (Eds.): Planning to Learn 2012. Proceedings of the ECAI Workshop on Planning to Learn (PlanLearn 2012), *CEUR Workshop Proceedings*, 950 (2012). Online CEUR-WS.org/Vol-950, urn:nbn:de:0074-560-7.
65. van der Putten, P.H.W, Veenman, C., Vanschoren, J., Israel, M., Blockeel, H. (Eds.): Proceedings of the 20th Annual Belgian-Dutch Conference on Machine Learning (BENELEARN 2011). The Hague, Universiteit Leiden (2011)

### Book chapters

66. Lawrynowicz, A., Esteves, D., Panov, P., Soru, T., Džeroski, S., Vanschoren, J (2016) An Algorithm, Implementation and Execution Ontology Design Pattern. *In: Studies on the Semantic Web 25* (Hitzler, P., Gangemi, A., Janowicz, K., Krisnadhi, A., Presutti, V., eds.) IOS Press.
67. Vanschoren, J., Vespier, U., Miao, S., Cachucho, R. and Knobbe, A. (2013) Large-scale sensor network analysis. *In: Big Data Management, Technologies, and Applications* (Hu W.C., Kaabouch, N., eds.), IGI Global.
68. Vanschoren, J. (2011) Meta-learning architectures. *In: Meta-learning in Computational Intelligence* (N. Jankowski, W. Duch, K. Grabczewski, eds.), Springer.
69. **Berendt, B., Vanschoren, J. and Gao, B. (2011) Datenanalyse und -visualisierung. In: Handbuch Forschungsdatenmanagement (S. Büttner, H-C. Hobohm, L. Müller, eds.), Bock+Herchen.**
70. Vanschoren, J., Blockeel, H. (2010) Experiment Databases. *In: Inductive Databases and Constraint-Based Data Mining* (S. Dzeroski, B. Goethals, P. Panov, eds.), Springer.

### Dissertations

71. Vanschoren, J. (2010). Understanding Machine Learning Performance with Experiment Databases. PhD Thesis, Katholieke Universiteit Leuven.