

# dr. ir. Rein Houthoof

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## Summary

Expertise in fundamental AI/ML research, specifically focusing on deep learning, with a strong publication track record. ML engineering and applied research management experience in building high-throughput online recommendation/personalization systems. See [reinhouthoof.github.io](http://reinhouthoof.github.io) for a more complete description.

## Current position

*Senior Research Scientist*, Netflix Research . . . . . [research.netflix.com](http://research.netflix.com)

Applied machine learning research for recommendation systems.

## Areas of specialization

Artificial Intelligence • Machine Learning • Software Engineering

## Experience

- 2018-2020 Head of AI, Happy Elements . . . . . [www.happyelements.us](http://www.happyelements.us)
- With over 100 million unique monthly active users, Happy Elements is the producer of one of the largest active mobile games worldwide. In 2018 I joined the company to co-found and co-lead its AI lab with the goal of optimizing mobile gaming experience through machine learning. Since its inception, the team grew to over 20 members, with presence both in Beijing and San Francisco. Through the development of algorithms, system, and models as well as the supporting production infrastructure, the AI lab is able to significantly impact company revenue by increasing the overall player life-time value and retention.
- 2017-2018 Research Scientist, OpenAI . . . . . [www.openai.com](http://www.openai.com)
- Researching deep reinforcement learning, particularly solving the exploration-exploitation trade-off problem through curiosity-based learning, generative modeling, and meta-learning.
- 2014-2017 Doctoral Researcher, imec . . . . . [www.imec-int.com](http://www.imec-int.com)
- 2016 Machine Learning Research Intern, OpenAI . . . . . [www.openai.com](http://www.openai.com)
- 2012 Software Engineering Intern, Solvace . . . . . [www.solvace.com](http://www.solvace.com)
- 2011 Combinatorial Optimization Researcher, ArcelorMittal – KU Leuven . . . . . [set.kuleuven.be/codes](http://set.kuleuven.be/codes)

## Education

- 2014-2017 Ph.D. in Computer Science and Engineering . . . . . Universiteit Gent, Belgium
- Research on structured prediction, computer vision, and deep reinforcement learning applied to simulated robotics and autonomous vehicles.
- 2016 Visiting Student Researcher . . . . . University of California–Berkeley, USA
- Researching deep reinforcement learning at the Berkeley AI Research Lab (BAIR).
- 2012-2014 M.Sc. in Computer Science and Engineering . . . . . Universiteit Gent, Belgium
- 2008-2012 B.Sc. in Industrial Engineering . . . . . Associatie KU Leuven, Belgium

## Professional service

- 2019 Reviewer, Neural Information Processing Systems (NIPS)  
Programm Comittee, NeurIPS Deep Reinforcement Learning Workshop  
Grant Reviewer, Swiss National Science Foundation  
Reviewer, IEEE Robotics and Automation Letters
- 2018 Reviewer, International Conference on Learning Representations (ICLR)  
Organizer, NeurIPS Deep Reinforcement Learning Workshop  
Reviewer, IEEE Transactions on Pattern Analysis and Machine Intelligence  
Reviewer, IEEE Transactions on Mobile Computing
- 2017 Organizer, NIPS Deep Reinforcement Learning Symposium  
Teacher, Deep Reinforcement Learning Bootcamp at UC Berkeley
- 2016 Program Committee Member, NIPS Deep Reinforcement Learning Workshop  
Reviewer, Neural Information Processing Systems (NIPS)

## Publications

### CONFERENCE ARTICLES

- 2018 Houthoofd, R., Chen, R. Y., Isola, P., Stadie, B. C., Wolski, F., Ho, J., Abbeel, P. (2018). Evolved Policy Gradients. In *Advances in Neural Information Processing Systems (NeurIPS)*, Montreal, Canada
- Stadie, B. C., Yang, G., Houthoofd, R., Chen, X., Duan, Y., Yuhuai, W., Abbeel, P., Sutskever, I. (2018). Some Considerations on Learning to Explore via Meta-Reinforcement Learning. In *Advances in Neural Information Processing Systems (NeurIPS)*, Montreal, Canada
- Plappert, M., Houthoofd, R., Dhariwal, P., Sidor, S., Chen, R.Y., Chen, X., Asfour, Y., Abbeel, P., and Andrychowicz, M. (2018). Parameter Space Noise for Exploration. *International Conference on Learning Representations (ICLR)*.
- 2017 Tang, H., Houthoofd, R., Foote, D., Stooke, A., Chen, X., Duan, Y., Schulman, J., De Turck, F., and Abbeel, P. (2017). #Exploration: A study of count-based exploration for deep reinforcement learning. In *Advances in Neural Information Processing Systems (NIPS)*, Long Beach, USA
- 2016 Houthoofd, R., Chen, X., Duan, Y., Schulman, J., De Turck, F., and Abbeel, P. (2016). VIME: Variational information maximizing exploration. In *Advances in Neural Information Processing Systems (NIPS)*, pages 1109–1117, Barcelona, Spain.
- Chen, X., Duan, Y., Houthoofd, R., Schulman, J., Sutskever, I., and Abbeel, P. (2016). InfoGAN: Interpretable representation learning by information maximizing generative adversarial nets. In *Advances in Neural Information Processing Systems (NIPS)*, pages 2172–2180, Barcelona, Spain.
- Duan, Y., Chen, X., Houthoofd, R., Schulman, J., and Abbeel, P. (2016). Benchmarking deep reinforcement learning for continuous control. In *Proceedings of the 33rd International Conference on Machine Learning (ICML)*, pages 1329–1338, New York, USA.
- Houthoofd, R., De Boom, C., Verstichel, S., Ongenaes, F., and De Turck, F. (2016). Structured output prediction for semantic perception in autonomous vehicles. In *Proceedings of the 30th AAAI Conference on Artificial Intelligence*, Phoenix, Arizona, USA.
- 2015 Houthoofd, R., Sahhaf, S., Tavernier, W., De Turck, F., Colle, D., and Pickavet, M. (2015). Robust geometric forest routing with tunable load balancing. In *Proceedings of the IEEE Conference on Computer Communications (INFOCOM)*, pages 1382–1390, Hong Kong, P.R. China.
- 2014 Houthoofd, R., Sahhaf, S., Tavernier, W., De Turck, F., Colle, D., and Pickavet, M. (2014). Fault-tolerant greedy forest routing for complex networks. In *Proceedings of the 6th International Workshop on Reliable Networks Design and Modeling (RNDM)*, pages 1–8, Barcelona, Spain.
- De Backere, F., Hanssens, B., Heynssens, R., Houthoofd, R., Zuliani, A., Verstichel, S., Dhoedt, B., and De Turck, F. (2014). Design of a security mechanism for RESTful Web service communication through mobile clients. In *Proceedings of the IEEE/IFIP Network Operations and Management Symposium (NOMS)*, pages 1–6, Krakow, Poland.

### JOURNAL ARTICLES

- 2016 Houthoofd, R. and De Turck, F. (2016). Integrated inference and learning of neural factors in structural support vector machines. *Pattern Recognition*, 59:292–301.
- 2015 Houthoofd, R., Ruyssinck, J., van der Hertten, J., Stijven, S., Couckuyt, I., Gadeyne, B., Ongenaes, F., Colpaert, K., Decruyenaere, J., Dhaene, T., and De Turck, F. (2015). Predictive modelling of survival and length of stay in critically ill patients using sequential organ failure scores. *Artificial Intelligence in Medicine*, 63(3):191 – 207.

Houthoof, R., Sahhaf, S., Tavernier, W., De Turck, F., Colle, D., and Pickavet, M. (2015). Optimizing robustness in geometric routing via embedding redundancy and regeneration. *Networks*, 66(4):320–334.

#### PATENT APPLICATIONS

2016

Houthoof, R., Verstichel, S., Debilde, B., and Foster, C. A controller for a working vehicle. E.U. Patent Application No. 16177346.0 - 1905. U.S. Patent Application No. 15/199,090. Filed 30 June 2016.