

# Dan Rosenbaum

Research Scientist, DeepMind

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## Contact

### Details

DeepMind  
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## Research Interests

Machine learning; Computer vision; Generative modeling; Statistical signal processing; 3D scene understanding; Variational inference.

## Education

### Ph.D. in Computer Science (2016)

The Hebrew University of Jerusalem, Israel

Dissertation: Learning Generative Models and the Inference Process in Low Level Vision.

Advisor: Prof. Yair Weiss.

### M.Sc. in Computer Science (2010)

The Hebrew University of Jerusalem, Israel

Thesis: Information Processing for Optimal Behavior.

Advisor: Prof. Naftali Tishby.

### B.Sc. in Computer Engineering (2006)

The Hebrew University of Jerusalem, Israel

Intelligent Systems Program. Dean's list of honors.

Final project: Pattern Recognition and Fingerprinting in Music.

## Research Experience

### Research Scientist (2016 - present)

DeepMind, London, UK

Deep Learning Team, Dr. Koray Kavukcuoglu, Dr. Oriol Vinyals, Dr. Ali Eslami.

### Algorithms Engineer (2006 - 2016)

Mobileye Vision Technologies, Jerusalem, Israel

Developing computer vision algorithms for automotive applications.

## Publications

In the field of machine learning, publications in conferences are usually considered equally and sometimes more valuable than journal publications. Conferences and most workshops accept only peer reviewed papers, and can be more competitive than the top journals in the field, having higher impact factors and lower acceptance rates.

In DeepMind, research is done in a very collaborative fashion, often leading to many contributors appearing in the authors list. All papers listed here are papers for which I had a major contribution. In particular, in (4) I have conducted many experiments, contributed to the understanding of the model and to its presentation in the paper; in (6) and (7) I led the development of the model, its analysis and its implementation.

1. Learning the local statistics of optical flow  
**Dan Rosenbaum**, Daniel Zoran, Yair Weiss.  
*Proceedings of the 27th Conference on Neural Information Processing Systems (NeurIPS), 2013 (acceptance rate: 25.4%, 25 citations)*
2. The return of the gating network: combining generative models and discriminative training in natural image priors  
**Dan Rosenbaum**, Yair Weiss.  
*Proceedings of the 29th Conference on Neural Information Processing Systems (NeurIPS), 2015 (acceptance rate: 22%, 13 citations)*  
*Accepted as a spotlight presentation.*
3. Subspace learning with partial information  
Alon Gonen, **Dan Rosenbaum**, Yonina Eldar, Shai Shalev-Shwartz.  
*The Journal of Machine Learning Research 17, 2017 (IF: 4.091, 31 citations)*
4. Neural scene representation and rendering  
SM Ali Eslami, Danilo Jimenez Rezende, Frederic Besse, Fabio Viola, Ari S Morcos, Marta Garnelo, Avraham Ruderman, Andrei A Rusu, Ivo Danihelka, Karol Gregor, David P Reichert, Lars Buesing, Theophane Weber, Oriol Vinyals, **Dan Rosenbaum**, Neil Rabinowitz, Helen King, Chloe Hillier, Matt Botvinick, Daan Wierstra, Koray Kavukcuoglu, Demis Hassabis.  
*Science, 360(6394):1204–1210, 2018 (IF: 41.845, 240 citations)*
5. Learning models for visual 3d localization with implicit mapping  
**Dan Rosenbaum**, Frederic Besse, Fabio Viola, Danilo J Rezende, SM Ali Eslami.  
*Bayesian Deep Learning workshop, Neural Information Processing Systems (NeurIPS), 2018 (acceptance rate for oral presentation: 2.9%, 14 citations)*  
*Accepted as an oral presentation.*
6. Conditional neural processes  
Marta Garnelo, **Dan Rosenbaum**, Chris J Maddison, Tiago Ramalho, David Saxton, Murray Shanahan, Yee Whye Teh, Danilo J Rezende, SM Ali Eslami.  
*Proceedings of the 35th International Conference on Machine Learning (ICML), 2018 (acceptance rate: 25.1%, 157 citations)*
7. Neural processes  
Marta Garnelo, Jonathan Schwarz, **Dan Rosenbaum**, Fabio Viola, Danilo J Rezende, SM Ali Eslami, Yee Whye Teh.  
*Theoretical Foundations and Applications of Deep Generative Models Workshop, International Conference on Machine Learning (ICML) 2018 (acceptance rate for oral presentation: 16%, 138 citations)*  
*Accepted as an oral presentation.*
8. Attentive neural processes  
Hyunjik Kim, Andriy Mnih, Jonathan Schwarz, Marta Garnelo, Ali Eslami, **Dan Rosenbaum**, Oriol Vinyals, Yee Whye Teh.  
*International Conference on Learning Representations (ICLR) 2019 (acceptance rate: 31.4%, 69 citations)*

## Invited Talks

Imperial College London, Department of Computing. Prof. Andrew Davison's Lab (2019)  
Oxford University, Department of Computer Science (2019)  
DeepMind, London (2016)  
Hebrew University of Jerusalem, Israel, Machine Learning Seminar (2016)

IBM Research Israel, Machine Learning Seminar (2016)  
Ben Gurion University, Machine Learning Seminar (2014)

## **Community Activities**

### **Program committee member:**

NeurIPS: 2016, 2017, 2018, 2019, 2020

ICML: 2017, 2018, 2019, 2020

### **Co-organiser of workshop**

The 33rd Conference on Neural Information Processing Systems (NeurIPS) 2019

Perception as Generative Reasoning: Structure, Causality, Probability.

Including 21 accepted papers, 5 invited talks, and more than 100 participants.

## **Teaching**

### **Teaching Assistant**

The Hebrew University of Jerusalem, Israel

Digital Signal Processing: 2011, 2012, 2013, 2014.