Jakub M. Tomczak

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About

- 10+ years experience in AI (designing, developing, implementing and formulating research directions)
- Carrying out cutting-edge-research in AI (deep learning, deep generative modeling, Bayesian inference)
- Applying AI to image processing, medical imaging, biomedical data analysis, program execution optimization, credit scoring, logistics, agriculture, and robotics

Work Experience

Nov 2019 - Present **Vrije Unviersiteit Amsterdam**, the Netherlands
Assistant Professor of Artificial Intelligence
Research: deep generative modeling, deep learning, derivative-free optimization

Oct 2018 - Dec 2019 **Qualcomm AI Research**, Amsterdam, the Netherlands (**industry**)
Deep Learning Researcher (Staff Engineer)
Research: video compression, Bayesian optimization, deep learning

Oct 2016 - Sept 2018 **Universiteit van Amsterdam**, the Netherlands
Postdoc/Marie Sklodowska-Curie Individual Fellow, supervision: Prof. Max Welling
Research: deep generative modeling, medical imaging

Feb 2016 - Jun 2016 **INDATA**, Poland
Researcher
Research: designing, developing and implementing deep learning for virtual screening (ligand-protein interactions)

Oct 2014 - Sept 2016 **Wroclaw University of Technology**, Poland
Assistant Professor
Research: deep generative modeling, deep learning, machine learning

Nov 2013 - Dec 2014 **Pol-Miedz Trans**, Poland
Researcher
Research: designing, developing and implementaing AI solutions for logistics

Oct 2012 - Sept 2014 **Wroclaw University of Technology**, Poland
Postdoc, supervision: Prof. Jerzy Swiątek
Research: machine learning

Sep 2012 - Dec 2012 **TK Telekom**, Poland
Researcher
Research: analysis of business processes

Jun 2009 - Sept 2012 **Wroclaw University of Technology**, Poland
Research assistant, supervision: Prof. Adam Grzech

Education

Oct 2009-Mar 2013 **Ph.D. in computer science (*with honors*), specialization: machine learning**
Wroclaw University of Technology, Poland

Title: Incremental Knowledge Extraction from Data for Non-Stationary Objects
Supervisor: Prof. Jerzy Swiątek

Aug 2008-Dec 2009 **M.Sc. in computer science**
Blekinge Institute of Technology, Sweden

Supervisor: Prof. Ludwik Kuzniarz

Oct 2004-Jul 2009 **M.Sc. in computer science**
Wroclaw University of Technology, Poland

Track: Pre-PhD
Supervisor: Prof. Jerzy Swiątek

Grants

2016-2018 **Principal Investigator**, Marie Sklodowska-Curie Individual Fellowship (EU), **177 599 €**

2016 **Researcher**, NCR&D (Poland), **7 909 741 PLN**

2013-2015 **Researcher**, NCR&D (Poland, EU), **10 672 218 PLN**

2009-2013 **Researcher**, NCR&D (Poland, EU), **36 000 000 PLN**

2012-2016 **Principal investigator**, individual grants four times, approx. **10 000 €**

Awards

2018-2020 **Oral presentations**: CVPR 2020, MIDL 2020, UAI 2019 (x2), AISTATS 2018

2019 Highest scoring reviewer (**top 400**) at NeurIPS 2019

2013 The Faculty award for **best Ph.D. theses**, Wroclaw University of Technology

2009 **The best M.Sc. thesis in Poland**, Polish Information Processing Society

Selected Publications

- **Conference articles**

1. M. Ilse, J.M. Tomczak, P. Forré, *Selecting Data Augmentation for Simulating Interventions*, ICML 2021

2. E. Hoogeboom, V.G. Satorras, J.M. Tomczak, M. Welling, *The Convolution Exponential and Generalized Sylvester Flows*, NeurIPS 2020

3. D.W. Romero, E.J. Bekkers, J.M. Tomczak, M. Hoogendoorn, *Attentive Group Equivariant Convolutional Networks*, ICML 2020

4. M. Ilse, J.M. Tomczak, C. Louizos, M. Welling, *DIVA: Domain Invariant Variational Autoencoder*, MIDL 2020

5. D. Abati, J.M. Tomczak, T. Blankevoort, S. Calderara, R. Cucchiara, B.E. Bejnordi, *Conditional Channel Gated Networks for Task-Aware Continual Learning*, CVPR, 2020

6. C. Oh, J.M. Tomczak, E. Gavves, M. Welling, *Combinatorial Bayesian Optimization using the Graph Cartesian Product*, NeurIPS 2019

7. A. Habibian, T. van Rozendaal, J.M. Tomczak, T.S. Cohen, *Video compression with rate-distortion autoencoders*, ICCV 2019

8. M. Ilse, J.M. Tomczak, M. Welling, *Attention-based Deep Multiple Instance Learning*, ICML 2018

9. J.M. Tomczak, M. Welling, *VAE with a VampPrior*, AISTATS 2018

10. T. Davidson, L. Falorsi, N. de Cao, T. Kipf, J.M. Tomczak, *Hyperspherical Variational Auto-Encoders*, UAI 2018

11. R. van den Berg, L. Hasenclever, J.M. Tomczak, M. Welling, *Sylvester Normalizing Flow for Variational Inference*, UAI 2018

- **Journal articles**

1. F. Lavitt, D.J. Rijlaarsdam, D. van der Linden, E. Weglarz-Tomczak, J.M. Tomczak, *Deep learning and transfer learning for automatic cell counting in microscope images of human cancer cell lines*, Applied Sciences 2021

2. I. Auzina, J.M. Tomczak, *Approximate Bayesian computation for discrete spaces*, Entropy 2021

3. E. Weglarz-Tomczak, J.M. Tomczak, A.E. Eiben, S. Brul, *Population-Based Parameter Identification for Dynamical Models of Biological Networks with an Application to Saccharomyces cerevisiae*, Processes, 2021

4. E. Weglarz-Tomczak, J.M. Tomczak, M. Talma, M. Burda-Grabowska, M. Giurg, S. Brul, *Identification of ebselen and its analogues as potent covalent inhibitors of papain-like protease from SARS-CoV-2*, Scientific Reports, 2021

5. E. Weglarz-Tomczak, J.M. Tomczak, S. Brul, *M2R: a Python add-on to cobrapy for modifying human genome-scale metabolic reconstruction using the gut microbiota models*, Bioinformatics, 2021

6. J.M. Tomczak, E. Weglarz-Tomczak, *Estimating kinetic constants in the Michaelis-Menten model from one enzymatic assay using Approximate Bayesian Computation*, FEBS Letters, 2019

Selected Reviewing Services

- **Conferences**

NeurIPS (2018, 2019, 2020, Area Chair: 2021), ICML (2019, 2020, 2021), ICLR (2019, 2020, 2021), AISTATS (2019, 2020, 2021), UAI (2021), MIDL (2018), INNF+@ICML (2020), INNF@NeurIPS (2019)

- **Journals**

IEEE Trans. on Pattern Analysis and Machine Intelligence, Journal of Machine Learning Research, Bioinformatics, Medical Image Analysis, Expert Systems with Applications, IEEE Journal of Biomedical and Health Informatics, Neural Processing Letters, BMC Bioinformatics, Knowledge-Based Systems

Skills and Experience

- **Managerial activities**
  - Research group co-lead (Machine Learning and Modeling at Wroclaw University of Science and Technology, Computational Intelligence at Vrije Universiteit Amsterdam)
  - Admission co-ordinator to the MSc AI program (Vrije Universiteit Amsterdam)
  - A part of the hiring team (Qualcomm)
- **Supervision**
  - 20+ BSc and MSc students (Wroclaw Univ. of Science and Technology, University of Amsterdam, Vrije Universiteit Amsterdam)
  - 8 PhD students, incl. 2 successfully accomplished projects (2016: Wroclaw Univ. of Science and Technology, 2020: Vrije Universiteit Amsterdam)
  - Supervising and mentoring researchers and interns (Qualcomm)
- **Technical Skills**
  - Python and Python AI packages (e.g., PyTorch, Tensorflow, Keras, scikit-learn)
  - Agile project management (Jira + Gitlab/Bitbucket/Github)
  - Parallel computing and cloud computing (e.g., Amazon AWS)
- **Others**
  - 4 patent applications (2 as a Qualcomm employee, 2 together with Bosch AI)