Jakub M. Tomczak

Address De Boelelaan 1111,
1081 HV, Amsterdam
the Netherlands

Mobile Phone +31 XXX XXX XXX
Webpage jmtomczak.github.io
Email jmk.tomczak@gmail.com

Scholar https://scholar.google.com/citations?user=XB99pR4AAAAJ

Summary

- **12y** experience in academia: **7y** as a postdoc/researcher, **5y** as an assistant professor
- **3.5y** experience working in and for industry
- carrying out cutting-edge research on AI (**1** book, **21** conference papers, **25** journal papers)
- experienced project manager and PI (**480 000** € in personal grants)
- experienced project developer of AI models & methods (**3** patent applications)

Work Experience

Mar 2022 - now **NatInLab, the Netherlands (industry)**
Advisor

Role: an advisory role for applications of AI to drug discovery

Nov 2019 - now **Vrije Unviersiteit Amsterdam**, the Netherlands
Assistant Professor of Artificial Intelligence

Role: carrying out research on deep generative modeling, deep learning, machine learning and derivative-free optimization with applications to image processing, robotics, biology, chemistry, biochemistry, medical imaging; involved in project management (KPIs and goals formulation, supervision & mentoring: 7 Ph.D. students, 24 M.Sc. students, 10 B.Sc. students), project development (models/algorithms implementation: Python & PyTorch & scikit-learn, version control using Git), grants writing, scientific writing (1 book, multiple articles); departmental roles: admission & pre-master coordinator, selecting committees; coordinating & teaching multiple courses

Oct 2018 - Dec 2019 **Qualcomm AI Research**, Amsterdam, the Netherlands (**industry**)
Deep Learning Researcher (Staff Engineer)

Role: a staff scientist working on AI (video compression, Bayesian optimization, deep learning); involvement in hiring processes, being a mentor for interns, co-leading a team, project management and development (scrum, agile software development/management, models/algorithms implementation: Python & PyTorch, version control using Git, Docker, AWS, cluster computing, KPIs and goals formulation); scientific writing (multiple articles); guest lecturing (1 course)

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

Role: carrying out research on deep generative modeling, deep learning and machine learning for image processing and medical imaging; involvement in project management (KPIs and goals formulation, supervision & mentoring: 1 Ph.D. student, 5 M.Sc. students), project development (models/algorithms implementation: Python & Keras & Tensorflow & PyTorch, version control using Git), grant writing, scientific writing (multiple articles); guest lecturing (2 courses)

Feb 2016 - Jun 2016 **INDATA SA**, Poland (**industry**)
Researcher (part-time)

Role: conducting research on developing deep learning models based on graph convolutions for virtual screening in drug discovery (ligand-protein interactions); involvement in project management and development (agile software development/management, version control using Git, goals formulation, models/algorithms implementation: Python & Tensorflow & RD-Kit)

Oct 2014 - Sept 2016 **Wroclaw University of Technology**, Poland
Assistant Professor

Role: carrying out research on deep generative modeling, deep learning and machine learning (ensemble learning, SVM, decision trees, decision rules) with applications to image processing, biology and medicine; involvement in project management (KPIs and goals formulation, supervision & mentoring: 1 Ph.D. student, 3 M.Sc. students, 6 B.Sc. students), project development (models/algorithms implementation: Python & Theano & Tensorflow & scikit-learn, version control using Git), grant writing, scientific writing (multiple articles); organization of a scientific group; coordinating and teaching multiple courses

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

Role: carrying out research on deep generative modeling (Boltzmann machines), deep learning and machine learning (ensemble learning, decision trees, decision rules, SVM) with applications to image processing and medicine; involvement in project management (KPIs and goals formulation, supervision & mentoring: 4 B.Sc. students), project development (models/algorithms implementation: Python & Theano & scikit-learn, Matlab, version control using Git), grant writing, scientific writing (multiple articles); teaching multiple courses; consulting for **TK Telekom sp. z o.o.** (Sept 2012 - Dec 2012): teleinformatics, business processes analysis and knowledge graph creation; consulting for **Pol-Miedz Trans sp. z o.o.** (Nov 2013 - Dec 2014): developing search algorithms for Service Oriented Architectures (SOA) in logistics using rough sets and Boltzmann machines & involvement in project management and development (agile software development/management, version control using Git, goals formulation, algorithms implementation in Matlab)

Jun 2009 - Sept 2012 **Wroclaw University of Technology**, Poland
Ph.D. student / Research assistant, supervision: Prof. Jerzy Swiątek

Role: carrying out research within my Ph. D. project on developing algorithms of incremental learning for logic-based representations (adaptive algorithms, change detection, applications: diabetes, teleinformatics), and working on machine learning projects (Gaussian Processes, ensemble learning, SVM, imabalanced data for credit scoring and medicine); involvement in scientific writing (multiple articles), project management and development (algorithms implementation in Matlab and a Java library Weka, goals formulation); teaching and TAing multiple courses

EDUCATION

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

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

Supervisor: Prof. Ludwik Kuzniarz

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

Supervisor: Prof. Jerzy Swiątek

GRANTS

2022-2026 **Principal Investigator**, Qualcomm Individual Grant, **280 000 €**

2022-2023 **Principal Investigator**, Network Institute, **10 000 €**

2020-2029 **Researcher**, NWO (Zwaartekracht Programma), **20 000 000 €**

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 & MEMBERSHIPS

2021-now **ELLIS member**

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

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

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

MANAGERIAL ROLES

2019-now **The M.Sc. AI program admission coordinator**, Vrije Universiteit Amsterdam

2019-2021 **The pre-master AI program coordinator**, Vrije Universiteit Amsterdam

2012-2016 **The "Modeling and Machine Learning" group coordinator**, Wroclaw University of Technology

SUPERVISION

Ph.D.

Accomplished:
- Gongjin Lan, December 16, 2020, Vrije Universiteit Amsterdam, co-promotor
- Szymon Zareba, December 13, 2016, Wroclaw Univ. of Technology, co-promotor

Ongoing:
- Maximilian Ilse, defense planned for: October 14, 2022, Universiteit van Amsterdam, co-promotor
- Emile van Krieken, defense planned for: spring 2023, Vrije Universiteit Amsterdam, co-promotor
- David Romero, defense planned for: fall 2023, Vrije Universiteit Amsterdam, co-promotor
- Jie Luo, defense planned for: winter 2024, Vrije Universiteit Amsterdam, co-promotor
- Anna Kuzina, defense planned for: spring 2025, Vrije Universiteit Amsterdam, co-promotor
- Sharvaree Vandgama, defense planned for: summer 2025, Universiteit van Amsterdam, co-promotor

M.Sc.

Accomplished: 21, **ongoing:** 3, Vrije Universiteit Amsterdam
Accomplished: 5, Universiteit van Amsterdam
Accomplished: 3, Wroclaw Univ. of Technology

B.Sc.

Accomplished: 7, **ongoing:** 3, Vrije Universiteit Amsterdam
Accomplished: 10, Wroclaw Univ. of Technology

TEACHING

M.Sc.

Deep Learning: coordinator, Vrije Universiteit Amsterdam, 2020–2022
Learning Machines: lecturer, Vrije Universiteit Amsterdam, 2020
Deep Learning: invited lecturer, Universiteit van Amsterdam, 2018-2019
Multimedia Systems: invited lecturer, Universiteit van Amsterdam, 2018
Decision Support Systems: teacher, Wroclaw Univ. of Technology, 2012-2016
Artificial Intelligence: teacher, Wroclaw Univ. of Technology, 2010-2012

B.Sc. **Computational Intelligence**: coordinator, Vrije Universiteit Amsterdam, 2020–2022
Systems Analysis & Decision Making: co-coordinator, Wroclaw Univ. of Technology, 2010-2016
Information Systems in Management: teacher, Wroclaw Univ. of Technology, 2010
Operation Systems: teacher, Wroclaw Univ. of Technology, 2010

TEACHING QUALIFICATIONS

2021 **Basiskwalificatie Onderwijs (BKO)**: the Netherlands

2015 **Didactic Course for Academic Staff**: Poland

SELECTED SCIENTIFIC SERVICES

- **Conferences**

Area Chair **NeurIPS**: 2021, 2022, **AISTATS**: 2022, 2023

Reviewer **NeurIPS**: 2018, 2019, 2020, **ICML**: 2019, 2020, 2021, 2022, **ICLR**: 2019, 2020, 2021, 2022, **AISTATS**: 2019, 2020, 2021, **UAI**: 2021, 2022, **MIDL**: 2018, **workshops** (ICML, NeurIPS, CVPR)

Secretary **Int. Conf. on Systems Science 2013**: Wroclaw, Poland,
National Automation Conference 2014: Wroclaw, Poland
Int. Conf. on Systems Science 2016: Wroclaw, Poland

- **Journals**

Editor Transactions of Machine Learning Research (Action Editor)

Reviewer IEEE Trans. on Pattern Analysis and Machine Intelligence, Journal of Machine Learning Research, Bioinformatics, Medical Image Analysis, Expert Systems with Applications, IEEE Transactions on Neural Systems & Rehabilitation Engineering, Knowledge-Based Systems, IEEE Journal of Biomedical and Health Informatics„ European Journal of Operation Research, Neural Processing Letters, BMC Bioinformatics

- **Other**

Examiner Ph.D. examiner: **6** times (Univ. of Geneva, Univ. of Liege, Surrey Univ., $2\times$ Oxford Univ., Univ. of Madrid)

Invited talks **6** conferences: SPP 2021, GenU 2021, INNF 2019, ML in PL 2019, PASC 2018, AI&Health 2022
6 academic groups: TII AI 2022, CMS-CERN 2022, AI4Science (UvA) 2021, CERN 2018, CWI Life Sciences 2018, TU/e Data Mining 2017
4 industrial groups: Qualcomm 2022, Booking.com 2021, Vinted 2021, Tooploox 2018
6 summer/winter schools: Indian CV & ML Summer School 2022, AI TECH 2022, beIT 2021, Nepal Winter School in AI 2021, AwesomeIT Amsterdam 2019, Croatian Data Science Summer School 2018

PUBLICATIONS

- **Book**

1. J.M. Tomczak, ”Deep Generative Modeling”, Springer, Cham, 2022

- **Conference articles**

1. A. Kuzina, M. Welling„ J.M. Tomczak, On Alleviating Adversarial Attacks on Variational Autoencoders with MCMC, NeurIPS 2022

2. K. Deja, A. Kuzina, T. Trzcinski, J.M. Tomczak, On Analyzing Generative and Denoising Capabilities of Diffusion-based Deep Generative Models, NeurIPS 2022

3. D.W. Romero, R.-J. Bruintjes, J.M. Tomczak, E.J. Bekkers, M. Hoogendoorn, J. van Gemert, Flexconv: Continuous kernel convolutions with differentiable kernel sizes, ICLR 2022

4. D.W. Romero, A. Kuzina, E.J. Bekkers, J.M. Tomczak, M. Hoogendoorn, CKCONV: Continuous kernel convolution for sequential data, ICLR 2022

5. E. Krieken, J.M. Tomczak, A. ten Teije, Storchastic: A Framework for General Stochastic Automatic Differentiation, NeurIPS 2021

6. Y. Perugachi-Diaz, J.M. Tomczak, S. Bhulai, Invertible DenseNets with concatenated Lipswish, NeurIPS 2021

7. M. Ilse, J.M. Tomczak, P. Forré, Selecting data augmentation for simulating interventions, ICML 2021

8. D.W. Romero, E.J. Bekkers, J.M. Tomczak, M. Hoogendoorn, Attentive group equivariant convolutional networks, ICML 2020

9. E. Hoogeboom, V. Garcia Satorras, J.M. Tomczak, M. Welling, The convolution exponential and generalized sylvester flows, NeurIPS 2020

10. J.M. Tomczak, E. Weglarz-Tomczak, A.E. Eiben, Differential evolution with reversible linear transformations, GECCO 2020

11. M. Ilse, J.M. Tomczak, C. Louizos, M. Welling, DIVA: Domain invariant variational autoencoders, MIDL 2020

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

13. I. Gatopoulos, R. Lepert, A. Wiggers, G. Mariani, J.M. Tomczak, Evolutionary Algorithm with Non-parametric Surrogate Model for Tensor Program Optimization, IEEE CEC 2020

14. CY. Oh, J.M. Tomczak, E. Gavves, M. Welling, Combinatorial Bayesian Optimization using the Graph Cartesian Product, NeurIPS 2019

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

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

17. R. van den Berg, L. Hasenclever, J.M. Tomczak, M. Welling, Sylvester Normalizing Flow for Variational Inference, UAI, Monterey, California, the USA, 2018

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

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

20. J.M. Tomczak, M. Welling, Improving Variational Auto-Encoders using convex combination linear Inverse Autoregressive Flow, Benelearn 2017 2017

21. J.M. Tomczak, M.Welling, Improving Variational Auto-Encoders using Householder Flow, NIPS Workshop on Bayesian Deep Learning 2016

- **Journal articles**

1. J. Luo, A. Stuurman, J.M. Tomczak, J. Ellers, A.E. Eiben, The Effects of Learning in Morphologically Evolving Robot Systems, Frontiers in Robotics and AI, 2022

2. F. Lavitt, D.J. Rijlaarsdam, D. vd 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

3. G. Lan, J.M. Tomczak, D.M. Roijers, A.E. Eiben., Time efficiency in optimization with a bayesian-evolutionary algorithm, Swarm and Evolutionary Computation, 2022

4. G. Lan, M. van Hooft, M. De Carlo, J.M.Tomczak, A.E. Eiben, Learning locomotion skills in evolvable robots, Neurocomputing, 2021

5. Y. Perugachi-Diaz, J.M. Tomczak, S. Bhulai, Deep learning for white cabbage seedling prediction, Computers and Electronics in Agriculture, 2021

6. 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

7. I.A. Auzina, J.M. Tomczak, Approximate bayesian computation for discrete spaces, Entropy, 2021

8. I. Gatopoulos, J.M. Tomczak, Self-supervised variational auto-encoders, Entropy, 2021

9. 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

10. E. Weglarz-Tomczak, D.J. Rijlaarsdam, J.M. Tomczak, S. Brul, GEM-based metabolic profiling for Human Bone Osteosarcoma under different glucose and glutamine availability, International Journal of Molecular Sciences, 2021

11. 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

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

13. J.M. Tomczak, S. Zareba, S. Ravanbakhsh, R. Greiner, Low-Dimensional Perturb-and-MAP Approach for Learning Restricted Boltzmann Machines, Neural Processing Letters, 2017

14. M. Drewniak, E. Weglarz-Tomczak, K. Ozga, E. Rudzinska-Szostak, K. Macegoniuk, J.M. Tomczak, M. Bejger, W. Rypniewski, L. Berlicki, Helix-loop-helix peptide foldamers and their use in the construction of hydrolase mimetics, Bioorganic Chemistry, 2018

15. A. Gonczarek, J.M. Tomczak, S. Zareba, J. Kaczmar, P. Dabrowski, M. Walczak, Interaction prediction in structure-based virtual screening using deep learning, Computers in Biology and Medicine, 2017

16. M. Zieba, S. Tomczak, J.M. Tomczak, Ensemble Boosted Trees with Synthetic Features Generation in Application to Bankruptcy Prediction, Expert Systems with Applications, Vol. 58, pp. 593–101, 2016

17. J.M. Tomczak, On some properties of the low-dimensional Gumbel perturbations in the Perturb-and-MAP model, Statistics and Probability Letters, 2016

18. J.M. Tomczak, A. Gonczarek, Learning invariant features using Subspace Restricted Boltzmann Machine, Neural Processing Letters, 2016

19. A. Gonczarek, J.M. Tomczak, Articulated tracking with manifold regularized particle filter, Machine Vision and Applications, 2016

20. J.M. Tomczak, Learning Informative Features from Restricted Boltzmann Machines, Neural Processing Letters, 2016

21. J.M. Tomczak, M. Zieba, Probabilistic combination of classification rules and its application to medical diagnosis, Machine Learning, 2015

22. J.M. Tomczak, M. Zieba, Classification Restricted Boltzmann Machine for comprehensible credit scoring model, Expert Systems with Applications, 2015

23. M. Zieba, J.M. Tomczak, Boosted SVM with active learning strategy for imbalanced data, Soft Computing, 2014

24. M. Zieba, J.M. Tomczak, J. Swiatek, M. Lubicz, Boosted SVM for extracting rules from imbalanced data in application to prediction of the post-operative life expectancy in the lung cancer patients, Applied Soft Computing, 2014

25. J.M. Tomczak, A. Gonczarek, Decision rules extraction from data stream in the presence of changing context for diabetes treatment, Knowledge and Information Systems, 2013

PATENT APPLICATIONS

1. Emiel Hoogeboom, Jakub M. Tomczak, Max Welling, Dan Zhang, Device for and computer implemented method of digital signal processing, US Patent App. 17/242,710
2. Davide Abati, Babak Ehteshami Bejnordi, Jakub M. Tomczak, Tijmen P.F. Blankevoort, Conditional Computation For Continual Learning, US Patent App. 17/097,811
3. Changyong Oh, Efstratios Gavves, Jakub M. Tomczak, Max Welling, Combinatorial bayesian optimization using a graph cartesian product, US Patent App. US16/945,625

REFEREES

Name	Max Welling
Company	Universiteit van Amsterdam / Microsoft Research
Position	Full Professor / Distinguished Scientist
Contact	welling.max@gmail.com

Name	Zeynep Akata
Company	University of Tübingen
Position	Full Professor
Contact	zeynep.akata@uni-tuebingen.de

Name	Efstratios Gavves
Company	Universiteit van Amsterdam
Position	Associate Professor
Contact	efstratios.gavves@gmail.com