

TOMASZ KORBAK

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Institute of Philosophy and Sociology, Polish Academy of Sciences

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INTERESTS

Machine learning: deep representation learning, natural language processing, reinforcement learning, Bayesian machine learning

Cognitive science: Bayesian approaches in computational neuroscience: predictive coding, active inference, computational approaches to language, emergent communication

Philosophy of science: enactivism, free energy principle, signaling games

RESEARCH EXPERIENCE

**Human Interactivity and Language Lab,
Faculty of Psychology, University of Warsaw**

Research assistant/Master's student

February 2019 – present

Investigating the emergence of compositional communication in multi-agent systems under the project “Developmentally informed agent-based modeling of symbolic constraints in interaction” led by Prof. Joanna Rączaszek-Leonardi.

**Institute of Philosophy and Sociology,
Polish Academy of Sciences**

Principal investigator

November 2016 – present

Theoretical work on Bayesian approaches in computational neuroscience, representation learning in deep neural networks and enactive cognitive science under the project “Formal and computational models of self-organization in cognitive science” led by me and supervised by Prof. Marcin Miłkowski.

**Institute of Computer Science,
Polish Academy of Sciences**

Research intern

April 2017 — November 2017

I worked on neural network-based tools for processing of Polish as part of Clarin-PL project, funded by the European Commission.

INDUSTRIAL EXPERIENCE

Sigmoidal, Machine Learning Engineer

June 2018 — present

Samsung R&D, Junior NLP Engineer

April 2017 — December 2017

Intelclinic, Python Developer

December 2015 — March 2017

Webinterpret, Junior Python Developer Intern

July 2015 — September 2015

EDUCATION

MSc in Cognitive Science, University of Warsaw

2016 – 2019

BSc in Cognitive Science, University of Warsaw

2013 – 2016

BAs in Philosophy, University of Warsaw

2012 – 2015

SUMMER SCHOOLS

Bayesian Methods in Deep Learning, Moscow

2018

School of Pioneers (tech entrepreneurship workshops), University of Cambridge

2018

Computational Psychiatry Course, ETH Zurich

2017

SELECTED PAPERS

1. Korbak, T., Zubek, J., Kuciński, Ł., Miłoś, P. & Rączaszek-Leonardi, J. (2019). Developmentally motivated emergence of compositional communication via template transfer. Accepted to NeurIPS 2019 workshop “Emergent Communication: Towards Natural Language”.
2. Korbak, T. (2019). Computational enactivism under the free energy principle. *Synthese*.
3. Korbak, T. (2019). Unsupervised learning and the natural origins of content. *Avant*.
4. Korzeniowski, R., Rolczyński, R., Sadownik, P., Korbak, T. & Możejko, M. (2019). Exploiting Unsupervised Pre-training and Automated Feature Engineering for Low-resource Hate Speech Detection in Polish. *Proceedings of the PolEval 2019 Workshop*.
5. Korbak, T. & Żak, P. (2017). Fine-tuning Tree-LSTM for phrase-level sentiment classification on a Polish dependency treebank. *Proceedings of the 8th Language & Technology Conference (LTC 2017)*.
6. Korbak, T. (2015). Scaffolded Minds and the Evolution of Content in Signaling Pathways. *Studies in Logic, Grammar and Rhetoric*, 41 (54).
7. Korbak, T. (2015). Apercpcja transcendentalna w kantowskim modelu epigenezy czystego rozumu [Transcedental apperception in the Kantian model of the epigenesis of pure reason]. *Przegląd Filozoficzny – Nowa Seria*, 3 (95), p. 125-142.

CONFERENCE TALKS AND POSTERS

1. Korbak, T. (2019). Emergent compositional communication in generalized signaling games. 8th Peripatetic Conference on Modeling Cognitive Systems. Kiry, Poland.
2. Korbak, T. (2018). Evaluating the scalability of deep active inference. 7th Peripatetic Conference on Modeling Cognitive Systems. Małe Ciche, Poland.
3. Korbak, T. (2018). Po co nam zasada minimalizacji energii swobodnej? [Why do we need Free Energy Principle?] Predictive processing: prospects and limitations. Warsaw, Poland (invited talk).
4. Korbak, T. (2017). Free energy principle as a model of biological and cognitive self-organization. 6th Peripatetic Conference on Modeling Cognitive Systems. Kiry, Poland.

SKILLS

Python (web frameworks and data science ecosystem), C++, PyTorch, tensorflow, git, Docker, Kubernetes, slurm, cloud computing, GNU/Linux, L^AT_EX

AWARDS AND FELLOWSHIPS

Fellow of Collegium Invisibile	2017 – present
Minister of Science and Higher Education’s (Poland) scholarship for exceptional students	2016

ACADEMIC SERVICE

Member of the organizing committee of International Association for Computing and Philosophy conference, Warsaw, 21-23 June 2018.

FOREIGN LANGUAGES

Polish – native
 English – full professional proficiency
 French – basic