Piotr Piękos

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Education

KAUST, Saudi Arabia.
○ **GPA 4.0/4.0** Computer Science, Ph.D. (08.2022-Now)
Working on systematic generalization in neural networks and reinforcement learning algorithms.
Supervised by Prof. Jürgen Schmidhuber

University of Warsaw, Poland.
○ Mathematics, M.Sc. (grad. 2021)
Thesis about improving mathematical reasoning in BERT
○ Mathematics, B.Sc. (grad. 2018)
Thesis: a survey of machine learning methods in Natural Language Processing
○ Computer Science, B.Sc. (grad. 2017)
Thesis: an implementation of the face recognition algorithm as an application on an android phone.

Experience

05.2024–10.2024 **Amazon, Amsterdam, Netherlands**, *Applied Scientist Internship*.
Creating hierarchical discrete representations from dense vector representations used for representations of product in the Amazon catalog. The work will be published after going through internal Amazon processes.

06.2023–08.2023 **IDSIA, Lugano, Switzerland**, *Research Internship*.
Combined with prior remote collaboration from KAUST, this resulted in 3 submissions to top peer-reviewed conferences that are currently in the blind review. The papers are about improving the transformer's computational efficiency and sample efficient Goal-Conditioned Reinforcement Learning.

01.2022–06.2022 **Polish Academy of Sciences, AWAElab group**, *Researcher*.
I was a collaborator in the Fast and Precise paper, a Notable Top 5% paper at ICLR 2023.
○ Implemented experiments on the Sokoban environment.
○ Investigated extendability of the algorithm to new environments, e.g. First Order Logic solvers.

10.2021–01.2022 **Allegro.pl**, *Research Engineer*.
Improving the quality of the neural search used in the Allegro.pl portal. Improved the speed of the data processing for the training, which allowed to increase the size of the data used for the training and, hence, improved the performance of the model.

07.2017–06.2020 **ITmagination**, *Machine Learning Engineer / ML Team Leader*.
Designed machine learning systems for external companies. Responsibilities:
○ Analysis of systems and suggesting new methods for utilizing the companies' data.
○ Implementing and experimenting with machine learning models.
○ Creating a serving infrastructure that allows to utilize the models in production.
Example projects:
○ Automatic patent assistant that suggests mentors and next steps based on the description of the project. The implementation was based on the BERT language model.
○ System for predicting necessary staff to operate a shop on a given day.
○ Evaluating online influencers for marketing companies with Object detection methods such as Faster-RCNN.

07.2016–09.2016 **Hcore**, *Python Developer Internship*.
Backend Software Engineering in Python for a network monitoring product.

Publications

GCLR NeurIPS 2023 workshop **Efficient Value Propagation with the Compositional Optimality Equation**
PDF ↗ .
Piotr Piękos, Aditya Ramesh, Francesco Faccio, Jürgen Schmidhuber

SwitchHead: Accelerating Transformers with Mixture-of-Experts Attention
PDF ☒ .

Robert Csordás, Piotr Piękos, Kazuki Irie, Jürgen Schmidhuber

ICRA 2024 **Utilizing a Malfunctioning 3D Printer by Modeling Its Dynamics with Artificial Intelligence**.

Renzo Cabalero*, Piotr Piękos*, Eric Feron, Jürgen Schmidhuber

ICLR 2023, **Fast and Precise: Adjusting Planning Horizon with Adaptive Subgoal Search**
Notable Top **PDF** ☒ **Project website** ☒ .
5% Michał Zawalski, Michał Tyrolski, Konrad Czechowski, Tomasz Odrzygóźdź, Damian Stachura, Piotr Piękos, Yuhuai Wu, Łukasz Kuciński, Piotr Miłoś

ACL-IJCNLP **Measuring and Improving BERT's Mathematical Abilities by Predicting the Order of Re-**
2021, **Oral** **asoning** **PDF** ☒ **Project website** ☒ .

Piotr Piękos, Henryk Michalewski, Mateusz Malinowski

R0-FoMo **Mindstorms in Natural Language-Based Societies of Mind** **PDF** ☒ .
NeurIPS 2023 Mingchen Zhuge, Haozhe Liu, Francesco Faccio, Dylan R Ashley, Róbert Csordás, Anand Gopalakrishnan,
Workshop, Abdullah Hamdi, Hasan Abed Al Kader Hammoud, Vincent Herrmann, Kazuki Irie, Louis Kirsch, Bing Li,
Best Paper Guohao Li, Shuming Liu, Jinjie Mai, Piotr Piękos, Aditya Ramesh, Imanol Schlag, Weimin Shi, Aleksandar
Award Stanić, Wenyi Wang, Yuhui Wang, Mengmeng Xu, Deng-Ping Fan, Bernard Ghanem, Jürgen Schmidhuber

Open-source

BERT for trax: Added BERT model and masked language modelling pipeline preparation to trax.
Github ☒

Technical skills

Python, PyTorch, Huggingface, LLMs,
Natural Language Processing, Transformers,
Reinforcement Learning, Deep Learning,
Google Cloud Platform, AWS
C++, Haskell, SQL, Algorithms
Linux, Bash, GIT, Unit tests

Languages

English Fluent (111/120 TOEFL score)
Polish   Native

Interests

Chess, Computer Games, Music, Psychology