Uladzislau Yorsh

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Education

2022–present **Charles University in Prague**, PhD.

2020–2022 **Czech technical university in Prague**, Ing, graduated with honors.

2016–2020 **Czech technical university in Prague**, Bc.

Experience

Apr 2021–present **Research Assistant**, The BigCode project.

- Implemented Transformer model variants for code processing tasks, including classification and auto-completion.
- Proposed, implemented and evaluated two architectures for processing sequential inputs with $\mathcal{O}(n)$ complexity w.r.t. a sequence length.

May 2021–Oct 2021 **Data Science Intern**, Recombee s.r.o.

- Proposed and developed a new model for the next basket prediction task, which improved the IoU score by 10%.
- Worked on application of Transformers for recommendation.

Mar 2021–May 2021 **Research Assistant**, Inference Technologies.

- Proposed and implemented an unsupervised classification algorithm of wafer bin map defects, which improved the existing system performance from 0.76 to 0.81 kappa score.

Publications

ICANN 2022 **Linear Self-Attention Approximation via Trainable Feedforward Kernel**, *Mgr. Alexander Kovalenko, Ph.D.*

- Proposed and implemented a new attention mechanism with a linear complexity w.r.t. an input sequence length.
- Evaluated the model on the LRA benchmark and beaten most of the baseline models.
- `https://link.springer.com/chapter/10.1007/978-3-031-15934-3_67`

Other Projects

Aug 2021–Feb 2022 **SimpleTRON: Simple Transformer with O(N) Complexity**, *Mgr. Alexander Kovalenko, Ph.D*, *doc. Ing. Pavel Kordík, Ph.D.*, *et al*.

- Proposed and implemented a new attention mechanism with a linear complexity w.r.t. an input sequence length.
- Evaluated the model on the LRA benchmark and beaten baseline models.

Skills

Languages Python, C, C++, Scala, Java, JavaScript, R

Domains Machine Learning, Computer Vision, Signal Processing, Natural Language Processing, Data Preprocessing, Theoretical Informatics

Technologies PyTorch, Tensorflow, Keras, JAX, SQL, Docker, Apache Cassandra, Elasticsearch, MongoDB, Hadoop, SPARK, git, REST

Communication English (B2), Czech (B2), Russian (native)

Research Interests

My research interests include processing very long sequences (tens and potentially hundreds of thousands of tokens) with neural networks, and scalable neural networks for faster training.