Łukasz Staniszewski

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Experience

Warsaw University of Technology **Oct 2024 – Present**
Graduate Student Researcher *Warsaw, Poland*
Member of Computer Vision Lab, funded by Young PW Grant and supervised by two scientists from IDEAS NCBR. The **main contributor** to two research projects in image generation - analysis of diffusion models noising process (submitted to **ICLR 2025 Conference**) and their continual personalization (submitted to **NeurIPS 2024 Workshop**).

CISPA Helmholtz Center for Information Security **Jul 2024 – Sep 2024**
Research Intern *Saarbrücken, Germany*
Member of SprintML Lab, researching the mechanistic localization of neurons determining visual text on synthetic images generated by diffusion models. The project ended up as a **co-first author** submission to the **ICLR 2025 Conference**.

Quickchat AI **Apr 2023 – Jun 2024**
Machine Learning Engineer *Warsaw, Poland*
Working in a YC-backed startup, doing **applied research** in LLMs with RAG techniques for the **real robot's conversational engine**. Implemented the Intent Classifier, reaching 90% accuracy on hundreds of conversations along with the Explainability module, indicating knowledge sources that impacted the AI response. Recruited candidates in NLP.

Samsung R&D Institute **Aug 2022 – Apr 2023**
Natural Language Processing Engineer *Warsaw, Poland*
Applied researcher, improving Samsung's Voice Assistant performance. Trained Multilingual BERT for the Context Classification, outperforming all previous solutions for this task. Implemented multi-GPU training of the T5 for the Korean Text Generation and enhanced the Gibberish Text Detection model by hyperparameters search and zero-shot techniques.

Education

Warsaw University of Technology **2023 – Present**
Master of Science in Computer Science (AI specialization) *Warsaw, Poland*
- Current GPA: **4.82/5.00**
- Thesis: On forward diffusion process and conducting arithmetic operations with latent encodings for image editing.
- Relevant coursework: Advanced Deep Learning, Computer Vision, Neural Networks Compression, Music Information Retrieval, Advanced Machine Learning, Big Data, Data Mining.

Warsaw University of Technology **2019 – 2023**
Bachelor of Science in Computer Science (AI specialization) *Warsaw, Poland*
- GPA: **4.83/5.00**, graduated with a summa cum laude diploma.
- Thesis: Implementation and evaluation of a novel neural network using attention in the task of object detection.
- Relevant coursework: Neural Networks, Machine Learning Engineering, Calculus, Linear Algebra, Probability, Databases, Natural Language Processing, Numerical Methods, Multimedia, Software Engineering, Algorithms and Data Structures.

Publications

[PDF] Precise Parameter Localization for Textual Generation in Diffusion Models **(In review)**
Łukasz Staniszewski, Bartosz Cywiński*, Franziska Boenisch, Kamil Deja, Adam Dziedzic*

[PDF] There and Back Again: On the Relation between Noises, Images, and their Inversions in Diffusion Models **(In review)** **arXiv:2410.23530**
Łukasz Staniszewski, Łukasz Kuciński, Kamil Deja

[PDF] Low-Rank Continual Personalization of Diffusion Models **arXiv:2410.04891**
Łukasz Staniszewski, Katarzyna Zaleska*, Kamil Deja*

Honors and achievements

1. My Bachelor thesis (see [PDF]) was awarded the **Best Engineering Thesis in Algorithms** and the **Third Best Engineering Thesis in AI** in the 2024 best Polish thesis competition organized by IEEE and 4 Science Institute.
2. Awarded with the Rector's Scholarship six times in a row for outstanding academic performance, being in less than 8% of the best performing Computer Science students.
3. Received Best Poster Audience Award for the poster (see [PDF]) I presented at the MLinPL 2024 Conference.
4. First place in the EnsembleAI hackathon 2024.

Selected projects

Focus Convolutional Neural Network [Code]
Design, implementation, and evaluation of a new neural network architecture leveraging differentiable translation, scaling, and rotation for object detection - the Focus Convolutional Neural Network - outperforming Faster R-CNN, a state-of-the-art architecture in that field.

Vehicle Distance Estimation [Code]
Combining object detection (with YOLO) and metric depth estimation (with Depth Anything) to predict the distance to objects for autonomous vehicles. The proposed solution has been evaluated using the KITTI Detection Dataset.

Quantized Depth Estimation [Code]
Applying lightweight neural network architectures for depth estimation and researching the best quantization methods to reduce their size: Fuse Batch Norm, Post-Training Quantization (PTQ), and Quantization-Aware Training (QAT).

Transliteration in Neural Machine Translation [Code]
Investigating whether transliteration affects the efficiency of machine translation in natural language processing. Comparing the efficiency of translating Arabic sentences into English to translating the pre-romanized sentences.

Technical skills

Python	PyTorch, NumPy, pandas, matplotlib, scikit-learn, Diffusers, Accelerate, FastAPI, Django
ML tools	Weights & Biases, SLURM, Hydra, Distributed Data Parallel
Computer Vision	Image Generation (Diffusion, GANs, VAE), CNNs, Depth Estimation, Object Detection, Image Segmentation, Image processing
NLP	LLMs, Transformers, RNNs, Text processing, RAG, prompt engineering, Hugging Face
Other	git, shell, SQL, Rest API
Maths	Calculus, Linear Algebra, Probability, Statistics

Languages

Polish	Native Level
English	C1 Level (Cambridge Advanced English)
French	A2 Level

Referees

Kamil Deja
Postdoctoral Researcher at IDEAS NCBR and Warsaw University of Technology
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Adam Dziedzic
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