Bohdan Ivaniuk-Skulskyi

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Education

University of Lille, CRIStAL — Lille / Paris, France
PhD Researcher in Computer Science (Discontinued) — *October 2023 – August 2025*

National University of Kyiv-Mohyla Academy — Kyiv, Ukraine
Master's degree in Applied Mathematics (Honour degree, GPA: 97.45 / 100) — *September 2020 – July 2022*

National University of Kyiv-Mohyla Academy — Kyiv, Ukraine
Bachelor's degree in Applied Mathematics (Honour degree, GPA: 93.78 / 100) — *September 2016 – June 2020*

Experience

PitchBook Data (via SPD Technology) — Remote
Senior Machine Learning Engineer — *January 2025 – Present*
Stack: Python, LangGraph, LangChain, GCP, Kubernetes, PostgreSQL, Docker

- Contributing to **Navigator**, an agentic conversational search platform. Architected a stateful **Directed Cyclic Graph (DCG)** using **LangGraph** to govern a role-separated, multi-node architecture for iterative research.
- Designed API-based tools using **Pydantic** validation and semantic routing to orchestrate retrieval from heterogeneous sources, including PostgreSQL and **RAG** vector stores.
- Optimized the orchestration layer to support hundreds of concurrent agentic loops. Developed a parallel evaluation service to benchmark faithfulness, relevance, and hallucination metrics.

Cyclope.ai (VINCI Autoroutes) — Paris, France
Machine Learning Engineer (CIFRE PhD Fellow) — *January 2023 – August 2025*
Stack: Python, PyTorch, OpenVINO, Docker, AWS, RabbitMQ, MongoDB

- **Autonomous Vehicle Systems:** Engineered an end-to-end multi-GPU pipeline with **200ms** latency for vehicle speed estimation, Bird's Eye View transformation, and multi-camera tracking, handling **300M+ POST requests/day**.
- **Road Surveillance:** Boosted YOLO object detection accuracy from **0.91 to 0.96 mAP** and increased inference speed by **60%** by optimizing model serving with **OpenVINO** for CPU deployment.
- Designed technical specifications for distributed systems, managing synchronization across multiple physical machines.

TietoEvry (Infopulse) — Kyiv, Ukraine
Machine Learning Engineer — *October 2021 – January 2023*
Stack: Python, PyTorch, Triton, CLIP, PostgreSQL, Elasticsearch, AWS

- **Project NOROG:**Architected energy sector ML infrastructure, boosting search **Recall@5 from 0.55 to 0.84** via **CLIP**-based semantic retrieval.
- Fine-tuned a Distil-BERT model for token classification, improving search precision by **20%** and reducing inference latency.
- Deployed models using **Triton Inference Server**, handling **30k daily gRPC requests** and managing databases (Milvus & PostgreSQL) exceeding 2TB.

University of Toronto, Wearable Robotics Group — Remote
Machine Learning Research Intern — *April 2022 – September 2022*
Stack: Python, PyTorch, TensorFlow, Scikit-Learn, GCP

- Developed video classification models for lower-limb exoskeletons by merging 2D CNN encoders (MobileNet, EfficientNet) with temporal models (LSTMs, Transformers).
- Achieved state-of-the-art performance on the StairNet dataset (**98.3% Accuracy**, **98.2 F1-score**) for real-time environment recognition on hardware-constrained devices.

Samsung Research — Kyiv, Ukraine
ML Research Intern (Intelligent Security Lab) — *April 2021 – December 2021*
Stack: Python, TensorFlow Lite, ONNX, C++, Android

- Implemented on-device speaker identification using the Google TRILL model with user-refined fine-tuning.
- Engineered an audio spoofing detection layer using S-vectors and RawNet models on proprietary datasets.

- Integrated the CoViAR model for efficient compressed video action recognition directly on mobile devices.

Anadea Kyiv, Ukraine
Machine Learning Engineer *April 2021 – October 2021*
Stack: Python, PyTorch, Transformers, GPT, DVC, Docker

- **Zillow Project:** Architected an Image Captioning system combining Object Detection with GPT, raising the **BLEU score from 0.39 to 0.48** to assist users with vision impairments.
- Implemented a Multi-Modal (Vision-Text) system using CLIP for duplicate content detection, boosting **F1-score from 0.76 to 0.94**.

InDevLab Kyiv, Ukraine
Machine Learning Engineer *March 2020 – March 2021*
Stack: Python, BERT, Transformers, Docker, REST

- Leveraged BERT-based embeddings to build a multi-level matching system for complex item-text data.
- Fine-tuned Transformer models to achieve a significant performance jump, increasing the **F1-score from 0.62 to 0.92** and reducing false matches by **30%** in production.

Concorde Capital Kyiv, Ukraine
Investment Banking Intern *May 2019 – September 2019*

- Conducted market research and financial analysis across IT, Agriculture, and Logistics sectors to identify acquisition targets.

YouScan Kyiv, Ukraine
Data Analyst Intern *May 2017 – September 2017*

- Analyzed and classified large volumes of social media data to track brand sentiment and market trends for enterprise clients.

Teaching

Teaching Assistant, Introduction to Machine Learning by Dr. Ignatenko, National University of Kyiv-Mohyla Academy
September 2022 - December 2022; Sepetember 2023 - December 2023

Teaching Assistant, Introduction to Deep Learning by Dr. Ignatenko, National University of Kyiv-Mohyla Academy
September 2022 - December 2022

Teaching Assistant, Artificial Intelligence in Medicine (CSC2431HF) by Dr. Brudno and Dr. Laschowski, National University of Kyiv-Mohyla Academy, Ukrainian Catholic University, University of Toronto
September 2022 - December 2022

Publications

Personalization of Wearable Sensor-Based Joint Kinematics Estimation Using Computer Vision for Hip Exoskeleton Applications
C. Song, B. Ivanyuk-Skulskyi, A. Krieger, K. Luo, I. Kang
IEEE International Conference on Rehabilitation Robotics (ICORR), 2025. (PubMed)

Sequential Image Classification of Human-Robot Walking Environments using Temporal Neural Networks
B. Ivanyuk-Skulskyi, A.-G. Kurbis, A. Mihailidis, B. Laschowski
IEEE International Conference on Biomedical Robotics and Biomechatronics (BioRob), 2024. (IEEE)

Towards Lightweight Transformer Architecture: an Analysis on Semantic Segmentation
B. Ivanyuk-Skulskyi, N. Shvai, A. Llanza, A. Nakib
International Conference on Artificial Intelligence, Computer, Data Sciences and Applications (ACDSA), 2024. (Oral Presentation) (IEEE)

StairNet: Visual Recognition of Stairs for Human-Robot Locomotion
A.-G. Kurbis, D. Kuzmenko, B. Ivanyuk-Skulskyi, A. Mihailidis, B. Laschowski
BioMedical Engineering OnLine, 2024. (Springer)

Sequential Image Classification of Human-Robot Walking Environments using Temporal Neural Networks
B. Ivanyuk-Skulskyi, A.-G. Kurbis, A. Mihailidis, B. Laschowski
IEEE ICRA 2023 — Computer Vision for Wearable Robotics Workshop. (IEEE)

Geometric properties of adversarial images
B. Ivanyuk-Skulskyi, G. Kriukova, A. Dmytryshyn
IEEE Third International Conference Data Stream Mining & Processing (DSMP), 2020. (IEEE)

Skills

Languages: Ukrainian, Russian, English, French
Agentic AI: LangGraph, LangChain, OpenAI API, RAG Architectures, Semantic Routing, Tool Orchestration
Deep Learning & CV: PyTorch, TensorFlow, OpenCV, Transformers (HuggingFace, timm), TorchAudio
Model Optimization: ONNX, TorchScript, TensorRT, Knowledge Distillation
Engineering: Python, C++, Java, Docker, Kubernetes, gRPC, REST, Redis, PostgreSQL
Cloud: AWS (EC2, S3, RDS), GCP

Achievements

Competitive CIFRE Industrial Fellowship 2023: Awarded in partnership with Cyclope.ai
Kaggle Competitions Expert (Kaggle):
Quora Insincere Questions Classification (silver medal)
Mechanisms of Action (MoA) Prediction (silver medal)
Severstal: Steel Defect Detection (silver medal)
Scholar of ZAVTRA.UA stipend program of Victor Pinchuk Foundation, 2020