Aidar **Khatiullin**

Senior Software Engineer (C++/Python) · Computer Vision Systems

Novi Sad, Serbia & Remote

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Summary

Senior Software Engineer (C++/Python) with 10+ years of experience building computer vision systems used in production.

Involved across the full pipeline, from cameras and data collection to model training, deployment, and long-term support. Background in systems programming, performance tuning, and solving practical problems in messy real-world setups.

Worked as a senior engineer with occasional technical leadership in startups, experience in large engineering organizations with strong research and quality standards, and hands-on involvement in running a small business.

Skills

Core Engineering	C++, Python, perfomance tuning (Asm/SIMD, multithreading), Linux, Windows
Computer Vision & ML	Image processing, camera-based systems, classical and deep learning-based vision pipelines, model training and evaluation (OpenCV, PyTorch, CVAT)
Delivery & Operations	End-to-end delivery, on-prem deployments, system integration, hardware-aware development, monitoring, long-term support and customer and stakeholder interaction
Business & Product Context	Experience working under real product and operational constraints, making engineering trade-offs with cost, timelines, and maintainability in mind, and direct responsibility for running and operating a small business
Languages	English (intermediate), Serbian (B2), Russian (native)

Work Experience

Rescope

Lead Computer Vision Engineer & Consultant — *Jun. 2025 - Present*

- Led and owned multiple computer vision projects related to building and floorplan analysis, acting as a senior individual contributor with full technical ownership.
- Developed a building segmentation pipeline from satellite imagery, combining SAM-based masks with edge refinement and geometry-aware loss/gain fitting using primitive shapes.
- Built a PDF layout processing pipeline for extracting structured building data, combining object detection (YOLO), raw PDF vector data extraction, image-based post-processing, and LLM APIs for semantic data interpretation.
- Worked on floorplan segmentation from both vector and raster sources, including vector-based preprocessing, matching and transforming multiple representations of the same floorplan, graph-heuristic segmentation from vector data, and U-Net-based segmentation for raster images.
- Implemented backend services around the computer vision pipelines using FastAPI, exposing models and data processing workflows via production-ready APIs.
- Set up and maintained data preparation and annotation workflows, including dataset versioning and iteration using Roboflow.

ABBYY (CoreOCR Team)

Research Engineer & Principal C++ Developer — *Nov. 2021 - Oct. 2024*

- Worked as a researcher and C++ developer on core components of ABBYY's OCR engine, focusing on robustness and performance under real-world noisy inputs.
- Developed a boosting-based classifier to filter out garbage and non-text fragments early in the OCR pipeline, improving overall system stability under unpredictable input conditions.
- Improved text layout analysis by enhancing word boundary and line spacing detection using a BiLSTM-based model combining image features with document meta-information.
- Contributed to memory footprint reduction and runtime performance optimization of the OCR engine, including profiling, refactoring inference components, and low-level optimizations (multithreading, AVX).
- Worked on punctuation handling and post-recognition refinement, improving robustness and precision of language-related components for noisy and ambiguous inputs.

DataNerdsAI

Head of Computer Vision & Senior CV Engineer — *Nov. 2018 - Nov. 2021*

- Led the computer vision direction, combining hands-on development with technical leadership, customer communication, and system design.
- Designed and delivered multiple production-ready computer vision systems for agriculture and logistics, working end-to-end from requirements definition to deployment in customer environments.
- Built camera-based systems for recognizing harvester actions, detecting trucks, and estimating cargo fullness levels in warehouses and agricultural machinery, operating under harsh outdoor conditions and limited computational resources.
- Developed vision systems using RGB, depth (Intel RealSense), drone, and satellite imagery, including segmentation, detection, tracking, and classification tasks.
- Integrated computer vision solutions with on-prem infrastructure, edge devices (NVIDIA Jetson), and backend services, providing installation guidelines and long-term system support.
- Worked closely with customers to translate business processes and constraints into technical requirements, timelines, and system architectures.

Intelligent Security Systems

Computer Vision Researcher & C++ Developer — *Oct. 2016 - Nov. 2018*

- Worked on large-scale license plate recognition (LPR) systems, focusing on robustness, performance, and adaptability to real-world deployment conditions.
- Extended and adapted LPR systems for multiple countries (Thailand, UAE, Mexico, USA), handling variations in plate formats, fonts, colors, and environmental conditions.
- Improved character and number recognition using classical computer vision techniques, including curve- and shape-based analysis, template matching, and feature-based classification without neural networks.
- Performed low-level performance optimization of image processing pipelines, including multithreaded C++ implementations and SIMD vectorization (SSE) of core operations such as affine transforms and binarization.
- Adapted recognition pipelines for cargo and railway carriage number recognition, including handling broken symbols, unaligned text, and multi-camera result matching.
- Developed internal tools for analysis and evaluation of recognition results, including ground-truth comparison, string similarity metrics (Levenshtein distance), and C++ UI components using Qt.

Small Local Business in Serbia

Owner / Operator — *Nov. 2024 - Jun. 2025*

- Direct responsibility for running and operating a small business, including hiring, payroll, taxes, cost control, and day-to-day operations.
- Hands-on experience making decisions under financial, legal, and operational constraints, with full accountability for outcomes.

Education

Lomonosov Moscow State University

Bachelor's and Master's Degrees in Computer Science — *2012 – 2018*

- Faculty of Computational Mathematics and Cybernetics, Graphics and Media Lab.

Publications

Fast Occlusion Filling Method for Multiview Video Generation

A. Khatiullin, M. Erofeev, D. Vatolin. — *3DTV Conference, 2018.*

Software tool for automatic multiview video generation

A. Khatiullin — *Registered software, RF, 2019.*