Ivan Alles

Machine Learning Software Engineer

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I'm a software engineer focusing on machine learning, computer robot vision, and robotics with 25+ years of software development experience. As an early AI adopter, I've accomplished 10+ deep learning projects for industrial tasks.

Skills

Expert: Python, C++, C, numpy, OpenCV, CNTK, SVN.
Advanced: TensorFlow, C#, .NET, algorithms, robotics, SQL, Point Cloud Library, Git.
Familiar: TensorFlow.js, music information retrieval, Javascript, Vue, pandas, Java, Qt, Perl, Pascal, UML, OpenGL.

Work History

User-friendly AI framework for Industry

Founder at Urobots, 2019-2021

- Leading a team of experts, created a user-friendly AI framework to solve computer vision and robotics problems without coding.
- Developed AI algorithms for classification, object detection, semantic segmentation, robot-camera calibration.
- Designed REST APIs.
- Implemented software modules for camera, robot, and advanced Blockly programming.
- Applied the framework in 10+ customer projects.

Python, TensorFlow, CNTK, OpenCV.

Demonstration of human-AI collaboration in computational creativity (hobby project)

Software engineer, 2018-2021

- Developed a model to learn user preferences.
- Optimized GAN generator for usage in javascript.
- Developed a web application demonstrating human-AI collaboration in computational creativity.

Python, TensorFlow, TensorFlow.js, javascript, Vue.

Neural Network for Object Detection for industrial projects

Founder at Urobots, 2019-2021

- Developed computer vision algorithms for real-time object localization, achieving accuracy < 2 pix in position and < 2° in rotation.
- Created a transfer learning model, reducing the required number of training data by 90%.
- Applied the algorithm in 10+ projects in robotics, object counting, quality assurance.

Python, TensorFlow, TensorFlow.js, OpenCV, javascript, Vue.

Embedded AI for IDS Imaging

Founder at Urobots, 2019-2021

- Pioneered the introduction of deep learning models in low-energy consumption environments (CPU, FPGA).
- Applied deep learning in an interactive exhibit in Germany's most prominent science center.

Python, TensorFlow, CNTK, OpenCV, ARM, FPGA, Linux.

Robot vision to grasp unknown objects for Cronimet

Founder at Urobots, 2016-2019

- Implemented algorithms for segmentation and grasping of previously unseen objects in 2D and 3D.
- Designed and developed software processing 3D camera input and controlling the robot.

Python, TensorFlow, CNTK, OpenCV, Qt.

Optical quality control of industrial components

Founder at Urobots, 2016-2020

- Developed methods for defect detection using the minimal "defect / no defect" input on the whole image rather than labeling each defect separately.
- Implemented software for optical quality control of industrial components: object presence, segmentation, tracking, counting.

Python, TensorFlow, CNTK, OpenCV, Qt.

Optical assembly inspection of plate heat exchangers for Mahle

Founder at Urobots, 2012-2021

- Developed algorithms and applications to check the assembly correctness of products consisting of hundreds of near-identical specular parts, achieving 99.95% accuracy.
- Managed a team adapting the core algorithms for 100+ product types.
- Designed the relevant hardware (lightIng, cameras) for 15+ installations.

C++, python, JSON, XML, boost, OpenCV, Qt, MFC, Visual Studio.

Head Pose Tracking (hobby project)

Software engineer, 2012

- Developed and evaluated algorithms for real-time head pose tracking in video.

C++, opencv, OpenGL.

Computer Poker (hobby project)

Software engineer, 2010-2012

- Developed efficient algorithms and software for the Annual Computer Poker Competition.
- The program reached 4th place in the limit hold 'em 2-player event, challenging teams with tenfold human, computer, and time resources.

C#, C++, Java, Maven, Linux.

Automated Baggage Loading System for Grenzebach

Freelance software engineer, 2009-2013

- Developed methods and software for 3D object recognition and registration.
- Developed methods and software for LIDARs-robot calibration, reducing manual effort by 90%.
- Implemented physics and LIDAR simulation.
- Developed algorithms for optimization of container loading (3D knapsack).
- Designed and implemented production software and tools.

C++, XML, MFC, boost, Point Cloud Library.

Automotive drivers and middleware for SMSC

Freelance software engineer, 2007-2012

- Designed and developed various drivers: QNX Sound, Media Local Bus, EEPROM, Timer, GPIO.
- Implemented MOST middleware.
- Implemented PC simulation.

C, C++, C#, Visual Studio, Windows CE, ARM, INIC, Linux, QNX, OSEK.

GUI Coverage Profiler (hobby project)

Software engineer, 2007-2008

- Developed instrumentation methods required working on .NET assemblies without access to the source code.
- Designed and implemented a program for measuring test coverage of GUI elements in .NET applications.

C#, C++, Visual Studio, Linux.

C++ refactoring tool (hobby project)

Software engineer, 2007

- Developed scripts to convert the C++ grammar to the intermediate language of GNU tools Flex and Bison.
- Implemented a syntax error-tolerant parser and semantic analyzer.
- Programmed an add-in for Visual Studio to make code refactoring using a context menu.

C++, C#, perl, boost, Visual Studio.

Automotive drivers for Harman Becker Automotive Systems

Freelance software engineer, 2006-2007

- Replaced a hardware parallel bus with a software-based serial bus, reducing hardware costs by 10% and CPU load by 90%.
- Designed and implemented peripheral device drivers (SPI, RS-232, MLB, I2C) with CPU load reduced by 90% due to the use of DMA.
- Managed a team developing a boot loader for a radio unit.

C, C++, Visual Studio, V850, OSEK, INIC.

Control module for chemical analysis for Agilent Technologies

Software engineer at K2L GmbH, 2002-2005

- Implemented software components: GUI, generic data processing, inter-processor communication, device drivers.
- Designed and implemented a visual form editor for GUI development, simulation, and test tools.

C++, XML, Visual Studio, MFC, wxWidgets, Motorola MPC5200, OSE.

Automotive software and tools for German car manufacturers

Software engineer at K2L GmbH, 2000-2005

- Designed and developed GUI for instrument panels for Audi, VW, and Iveco.
- Designed and implemented the MOST Network Master function block for BMW. The software was 100% compliant with the MOST specification and became a reference project for ISO 9001 certification.
- Managed a team implementing device drivers (USB, RS-232) and tools.

C++, C, XML, Visual Studio, ARM7, ST10, Windows CE, OSEK.

Backend software for internet applications for E-Commerce

Software developer at Actis Systems Internet, 1999-2000

- Designed and implemented an application for monitoring changes in websites.
- Developed backend database management tools.

C++, COM, MS SQL Server, Oracle.

Photoscan for Science Center of Komi Republic, Russia

Freelance software engineer, 1999

- Developed methods and software to measure the volume of round timber on camera images.
- Managed the development team.

C++, image processing.

In-house software development for Energosbyt

Software Engineer at Energosbyt, 1998-1999

- Designed a contractors' database, incorporating contractors of all subsidiaries of the company.
- Designed and implemented a program for analyzing customers' data.
- Maintained and enhanced the company's software, consulted over 50 users.

Visual Basic, Fox Pro.

In-house software development for Komi Bank of Sberbank of Russia
Software Engineer at Komi Bank of Sberbank of Russia, 1996-1998

- Designed and implemented an analytical information system, incorporating financial indexes, information about all bank transactions, and a collection of converters for importing data from various sources.
- This work was awarded the First Prize in the "Young Banker 1997" republican competition.

Visual Basic, MS Access.

Electronic Signature for Bank Evropeysky Sever
Software developer at Diploma project, 1994-1995

- Developed an algorithm and implemented software to compress scanned signatures to 1% of the original size.

C++, Borland, image processing.

Education

Master of Science (M.S.) in Applied Mathematics
Syktyvkar State University, Russia
1990 – 1995

Courses

Music Information Retrieval
University of Victoria, 2021
Studied Extracting Information From Music Signals, Machine Learning for Music Information Retrieval, Music Retrieval Systems.

Robotics
Columbia University, 2017
Core techniques for representing robots that perform physical tasks in the real world.

Machine Learning
Stanford University, 2016
Certificate in machine learning.

Machine Learning Foundations
University of Washington, 2016
Studied classification, regression, and practical applications of machine learning.

Languages

Fluent in English, German, and Russian (native language). Elementary proficiency in Chinese.

Hobbies

Hiking, cross-country skiing, yoga, computer games.