Alexey Gronskiy

"Fresh"

"Past" and $\hbox{``Secondary''}$

CV

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Summary

nd in 1 ies

| startups, I worked in range of roles from software eningeering to data and ML engineering, and i range of fields from computer vision for airborne collision avoidance to financial data analysis. am a private pilot and paramedic assistant in my free time. In software development, my prioritie are systematism and clear communication. • 5 years industry (Software Engineering) | | | | | | |
|--|---|---|--|--|--|--|
| 5 years industry (Software Engineering)6 years academia (PhD, Computer Science) | | Married, two children | | | | |
| Skills | | | | | | |
| Listed below are the sk brushed up quickly. | ills split into "fresh" and | d "past" ("secondary") o | ones. The latter can be | | | |
| Areas of activity | | | | | | |
| Machine learning, deep learning Computer vision for autonomous flight Object detection, collision avoidance Simulation and real data fusion Large scale data analysis, ETL pipelines | | Neural networks verific Code review and docur Navigating regulatory MSc/BSc theses advise | mentation process standards | | | |
| Operating programmi | ng languages | | | | | |
| o C++ | Python | o Go | | | | |
| Software frameworks | | | | | | |
| Tensorflow, KerasOpenCV | gRPC/RESTPandas, Geopandas | Scikit-learn, PyMC3Networkx, OSMnx | Plotly, Dash, Folium Flask | | | |
| Stacks & Tools | | | | | | |
| CI/CD: Bazel, Jenkins, Docker, Git, Arcanist Packages: Nix, JFrog Artifactory, Anaconda Data: Hadoop MapReduce, Spark, Parquet [No]SQL: Redis, MongoDB, MariaDB | | GCP: Storage, Computing, KubeFlow Azure: Databricks & DataLake, DevOps Training: Determined AI, CUDA Organizational: Phabricator, JIRA, Confluence | | | | |
| Areas of activity | | | | | | |
| Natural Language Processing Question reformulation, morphological analysis Statistical Learning Theory Algorithmic robustness under uncertainty | | Teaching assistance External API design for SDK products Cross-platform UI development Database normalization analysis | | | | |
| Programming language | ges & Software framew | vorks | | | | |
| COM/COM+WinAPI/MFC | ○ C#○ Qt4 | MATLABOpenMP | HTML/JS/CSSHugo/Jekyll | | | |
| Stacks & Tools | | | | | | |

| o CI/CD: Google's Blaze, Mercurial, Bazaar, SVN, | Cloud: Google's Bor |
|--|---|
| various internal code review tools | Organizational: UMI |
| Data: Apache Beam, RabbitMQ | ○ Typesetting: LATEX |
| Databases: MySQL, PostgreSQL | |

Working Experience

2020–2021 Senior data engineer, SIX Banking Services, Zurich, Switzerland



- Organized technical stack, code review and other processes in a newly established data science unit.
 - O Performed analytical support of stakeholder business units, provided analysis and computed KPIs for ongoing projects in payment ecosystems.
- $\,\circ\,$ Participated in preparatory work for transition to cloud pipelines
- O Skills: Python, Geospatial analysis, Mircosoft Azure (Data Factory, DataLake, Databricks), JFrog Artifactory, data security and compliance.

2018-2020

Machine learning & computer vision engineer, Daedalean AI (ddln.ai &), Zurich, Switzerland



- Conceived and developed a prototype of a visual air-to-air object detection and tracking system (as part of autopilot collision avoidance).
- O Researched, evaluated and made early technical decisions, shaped out data acquisition and annotation strategies. Developed evaluation metrics, navigated aviation industry standards on operational performance.
- As part of a 4-member team, worked with European Aviation Safety Agency on defining the concepts of safety assurance for neural networks (coauthored gron.sk/codann &, see "Publications").
- O Conceived, developed an extendable and modularized machine learning evaluation and reporting framework used across several projects.
- Co-supervised interns and joint MSc/semester
- Carried out flight tests as a fixed-wing aircraft
- O Skills: C++14, Python, Tensorflow, Git, object detection and tracking, cloud computing and automation (GCP/GKE/KubeFlow/Jenkins), operational performance metrics, technical ownership, requirements design, product development cycle.

summer 2017 Research intern, Research and Machine Intelligence, Google Zurich, Switzerland



- tion reformulation (see Google AI blog post 12).
- O Developed several deep learning models for answer ranking.
- Presented at monthly meeting of Google Research.
- Worked on answer ranking module for active ques Approved for full-time conversion by the hiring committee.
 - Skills: Python, C++11, Tensorflow, NLP, experimental design, MapReduce, communication.

ETH zürich

2012–2018 **Doctoral research assistant, head teaching assistant**, Machine Learning Group, Department of Computer Science, ETH Zurich, Switzerland

- O Conducted research in both theoretical and practical fields (see "Projects" below).
- Launched medical collaborations with University Hospital Zurich (see www.cardioml.ch ぱ).
- Supervised several MSc theses.
- Taught "Introduction to Machine Learning" and "Statistical Learning Theory" courses, created a script for the latter.

2010–2012 C++ software engineer, ABBYY Software, Moscow, Russia

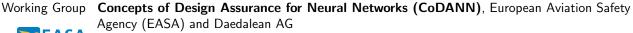


- O Worked on a framework for automated native language understanding and translation.
- O Designed, developed SDK wrappers for language
- morphology analysis and text classification.
- Skills: C++03, C#, COM/COM+/WinAPI, SVN, interface design, internal libraries, UML.

2008–2011 Independent (freelance) C++ developer

- Conceived and developed a cross-platform (Mac/Linux/Windows) tool for photo management, sold and maintained it.
- Skills: C++03, Qt 4, MercurialHg, PostgreSQL, selling and presentation.

Research Projects, Working Groups, Publications and Talks





- Participated in a working group (gron.sk/easa ♂) Co-authored a report "Concepts of Design Assurwhich aimed at establishing methods and concepts for ensuring operational safety of machine learning models in aviation.
 - ance for Neural Networks", whose official summary (gron.sk/codann ♂) was published by EASA.

Research Projects Statistical Mechanical Analysis of Combinatorial Free Energy, ETH Zurich with Center of & Publications Science of Information, Purdue University





- - International Conference on Analysis of Algorithms (AofA) 2017, Princeton
- tion Problems"
 - Analytic Combinatorics (SODA-ANALCO) 2017, Barcelona
- **ETH** zürich o "On Phase Transitions of Free Energy in Combi- o "Free Energy Rates for a Class of Optimization Problems"
 - International Conference on Analysis of Algorithms (AofA) 2014, Paris
 - "Phase Transitions in Parameter Rich Optimiza- O "Asymptotic Evaluation of Posterior Agreement for some Optimization Problems"
 - J. of Theor. Comp. Sci. (TCS) 2018

Robustness and Informativeness of Minimum Spanning Tree Algorithm, ETH Zurich

- rithms"
 - Joint ETH & Google Workshop, Google, Zurich, 2016
- "On Informativeness and Robustness of Algo- "How Informative are Minimum Spanning Tree Algorithms"
 - International Symposium on Information Theory (ISIT) 2014, Hawaii



Machine Learning for Cardiological Diseases (www.cardioml.ch 2), ETH Zurich with University Hospital Zurich and MPI Tübingen, Germany



- tween key factors of Acute Coronary and Takotsubo syndromes.
- O Detecting causal and statistical dependencies be- O Launched and co-led the project initially, supervised BSc and MSc theses.

Robust Solving of Algorithmic Problems, ETH Zurich with Institute of Theoretical Informatics,

o "Robust Optimization in the Presence of Uncertainty: a Generic Approach" J. of Computer and System Sciences (JCSS) 2018

Education

ETH zürich

2012–2018 Doctoral degree (Dr. Sci. ETH), Machine Learning Group, Department of Computer Science, ETH Zurich, Switzerland

> Ph.D. Thesis "Statistical Mechanics and Information Theory for Approximate Robust Inference" (gron.sk/thesis ♂).

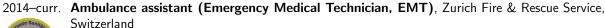
2006–2011 BSc + MSc, Department of Mathematics and Mechanics, Chair of Discrete Mathematics, Moscow State University of M.V. Lomonosov (MSU), Russia

- O Specialist (equiv. BSc + MSc) degree in Pure and Applied Mathematics, with Honors.
- Thesis "On some metrical properties of Boolean functions" (gron.sk/msc-thesis ♂).

Languages

| 0 | Russian | native | ○ German | fluent (C | 2 Goethe, | 2016 |
|---|---------|----------|----------|-----------|-----------|------|
| 0 | English | . fluent | o French | fluent (| C1 DALF, | 2011 |

Volunteer Work





- O Regularly training as an ambulance assistant.
- Participating in ambulance shifts during public events in the city of Zurich.
- O First responder to alarms from large-scale emergencies.

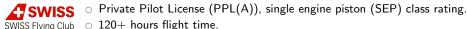
2007–2012 Lecturer/Teacher, MSU-/MIPT-based summer and winter schools ♂ for mathematics and programming, Russia



- Created original lecture/seminar materials.
- Conducted lectures and seminars for high school students.
- O Topics: mathematical analysis, discrete mathematics, programming.

Hobbies and Other Activities

Aviation Pilot, SWISS Flying Club (www.swissflyingclub.ch 2), Hausen am Albis, Switzerland



- SWISS Flying Club 0 120+ hours flight time.
- contests
- Programming O II prize team, All-Russia Programming Contest II prize team, Moscow Programming Contest (2005).
 - (2005).

- Sports & Music O Karate (gold medal in Swiss Spring Kyu- O Alpine skiing and snowboarding. tournament, 2014).

 - O Playing flute, guitar.

Pilot blog Author, Telegram channel "CrossWind Landing" (in Russian) (gron.sk/x-wind 다)



- O Telling the story of learning for private pilot license in Switzerland. O Topics about aerodynamics, meteorology, and the fun of flying.
- Blog Author, Personal blog on range of topics (gron.sk/posts ♂)
 - O Topics: aviation, tech, programming.