Alexey Gronskiy

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Highlights

Mathematician by training, computer science PhD, with experience in both corporations and startups, I am currently working on developing a vision-based certifiable collision avoidance system for autonomous aircraft control. I am a private pilot and paramedic assistant in my free time. In technological development, I value systematism together with efficient communication.

- 5 years industry (Software Engineering)
- o 6 years academia (PhD, Computer Science)
- Permanent Swiss residence permit ("C")
- Married, two children

Working Experience

Jul 2018-curr. Machine learning & computer vision engineer, Daedalean AI (ddln.ai 2), Zurich, Switzerland



- Conceived and developed a prototype of a visual air-to-air object detection and tracking system (as part of autopilot collision avoidance).
 - 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 c, 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 students.
- Carried out flight tests as a fixed-wing aircraft pilot.
- Skills: C++14, 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 ♂).
- Developed several deep learning models for an Skills: Python, C++11, Tensorflow, experimental swer 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.
 - design, data processing, 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 ♂).
- Supervised several MSc theses.
- o 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



- Worked on a framework for automated native language understanding and translation.
- 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



Working Group Concepts of Design Assurance for Neural Networks (CoDANN), European Aviation Safety Agency (EASA) and Daedalean AG

- 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





- o "On Phase Transitions of Free Energy in Combi- o "Free Energy Rates for a Class of Optimization natorics"
 - International Conference on Analysis of Algorithms (AofA) 2017, Princeton
- o "Phase Transitions in Parameter Rich Optimization Problems" Analytic Combinatorics (SODA-ANALCO) 2017, Barcelona
- Problems"
 - International Conference on Analysis of Algorithms (AofA) 2014, Paris
- "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- \circ "How Informative are Minimum Spanning Tree Algorithms"
 - International Symposium on Information Theory (ISIT) 2014, Hawaii



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



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

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

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

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

2006-2011



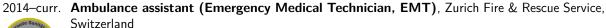
BSc + MSc, Department of Mathematics and Mechanics, Chair of Discrete Mathematics, Moscow State University of M.V. Lomonosov (MSU), Russia

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

Languages

• Russian native o German fluent (C2 Goethe, 2016) o French fluent (C1 DALF, 2011) o English..... fluent

Volunteer Work





- 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 emer-

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 &), Hausen am Albis, Switzerland



- Private Pilot License (PPL(A)), single engine piston (SEP) class rating.
- o 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).

 - Playing flute, guitar.

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



- Telling the story of learning for private pilot license in Switzerland.
- o Topics about aerodynamics, meteorology, and the fun of flying.