

# Résumé of Ivan Ukhov

Ivan Ukhov

ivan.ukhov@gmail.com,<sup>ω</sup> blog.ivanukhov.com,<sup>ω</sup> research.ivanukhov.com,<sup>ω</sup>

GitHub: IvanUkhov,<sup>ω</sup> LinkedIn: IvanUkhov,<sup>ω</sup> X: IvanUkhov<sup>ω</sup>

**Abstract**—In this paper, we summarize Ivan Ukhov’s education and career as well as other aspects related to his professional and personal growth. The objective is to make it easier for potential employers to obtain a sufficiently comprehensive understanding of the candidate’s profile and subsequently decide if and how to proceed with the recruitment process. However, the effectiveness of this presentation format remains an open research question.

**Index Terms**—Airflow, Cloudflare, computer science, data science, Git, GitHub, Google Cloud Platform, GraphQL, JavaScript, Kubeflow, Kubernetes, machine learning, OAuth 2.0, open source, probability theory, Python, research, Rust, software engineering, SQL, statistics, teaching, TensorFlow, Terraform.

## I. INTRODUCTION

**T**ALENT ACQUISITION becomes increasingly more difficult. There are many candidates with their unique backgrounds, abilities, and preferences, making it challenging to navigate. Under these circumstances, it is important to be able to reasonably fast make a sufficiently accurate evaluation if the candidate in question would be a good fit for the job at hand. Ivan Ukhov is one such candidate, and this paper presents his profile to assist in the aforementioned evaluation process. In what follows, we shall refer to Ivan as the candidate.

The subsequent sections go over several topics in the order of decreasing importance. Section II and III describe the candidate’s professional interests and technical skills, respectively, which are arguably the ones dictating the drive and the ability to follow through. Section IV, V, and VI present his experience in terms of working, teaching, and learning, respectively. In Section VII, the candidate’s formal education is summarized. Section VIII and IX list some of his scientific publications and open-source projects, respectively. In Section X, a glimpse into the candidate’s personal life is given. Lastly, Section XI concludes the paper.

## II. PROFESSIONAL INTERESTS

We begin with the candidate’s professional interests. They revolve around making business decisions under uncertainty and solving the accompanying engineering problems. This includes choosing directions based on evidence combined with prior knowledge, answering questions via inferential and predictive modeling, optimization of processes by means of learning from data, and development of data products. The underlying disciplines of interest are data science, machine learning, software engineering, and statistics.

<sup>ω</sup>An omega superscript indicates the presence of a link, which is sadly not accessible in print form due to the limitations of the medium.

## III. TECHNICAL SKILLS

Apart from the general, strong knowledge of software engineering, statistics, and machine learning, there are several specific methodologies and technologies the candidate has come across and acquired throughout his education and career: strong knowledge of Rust and Python, including their ecosystems; good knowledge of C++, Go, R, and shell scripting; strong knowledge of SQL; familiarity with JavaScript, HTML, and CSS; strong knowledge of TensorFlow; strong knowledge of Google Cloud Platform, including Kubernetes Engine and Vertex AI; strong knowledge of Docker and Terraform; good knowledge of GraphQL; strong knowledge of Airflow and Kubeflow; strong knowledge of GitHub, including GitHub Actions; strong knowledge of software testing and continuous integration and deployment; proficiency in version control with Git; and proficiency in Vim and LaTeX.

## IV. WORK EXPERIENCE

There have been three non-academic employers: LeoVegas (2018), Voi (2022), and The Type Founders (2023). The corresponding roles are given in reverse chronological order, which is also the one used in the remainder of the paper.

**February 2023–Present** *Staff Engineer at The Type Founders*: ★ Established a platform for managing and serving a large library of typefaces (Rust, Tokio, GraphQL, Google Cloud Platform, GitHub Actions). ★ Built a system for identifying visually similar typefaces (convolutional autoencoders). ★ Explored generation of typefaces (transformers). ★ Analyzed the state of the web with respect to the usage of fonts, as part of the Web Almanac by the HTTP Archive (BigQuery).

**February 2022–January 2023** *Staff Machine Learning Engineer at Voi*: ★ Established a platform for developing and running machine-learning projects, used throughout the company (Google Cloud Platform, GitHub Actions). ★ Participated in other projects led by the team, including inferential modeling based on sensor data from IoT units and image classification (TensorFlow) with object detection (PyTorch) in constrained environments (mobile devices, Raspberry Pi). ★ Participated in the recruitment of machine-learning engineers. ★ Mentored colleagues in machine learning and software engineering.

**November 2019–February 2022** *Head of Data Science at LeoVegas*: ★ Led the team, ensuring clarity and relevance of direction. ★ Held group and individual meetings. ★ Performed planning and setting of common and individual objectives.

**February 2018–February 2022** *Data Scientist at LeoVegas*: ★ Developed an experimentation platform for democratization and decentralization of hypothesis testing (Google Cloud Platform, Bayesian statistics). ★ Developed a predictive model

for identifying individuals who are at risk of gambling addiction (gradient boosting, recurrent neural networks). ★ Developed an inferential model and a natural-language-processing model for analyzing the results of customer surveys (Bayesian statistics, recurrent neural networks). ★ Developed a data-driven artificial environment for optimizing promotion campaigns via reinforcement learning (feedforward neural networks). ★ Developed a platform for data-science projects, including pipelines for data preparation, frameworks for predictive modeling, and infrastructures for scheduling and serving predictive models (Google Cloud Platform). ★ Participated in other projects led by the team, including causal inference in observational studies, churn prediction, high-value prediction, inference of spillover in marketing, lifetime-value prediction, marketing mix modeling, and recommender systems. ★ Participated in the recruitment of data scientists. ★ Mentored team members in data science, machine learning, and software engineering; see also Section V. ★ Led research projects on the topic of problem gambling in collaboration with the Karolinska Institute, Stockholm University, and Nottingham Trent University.

## V. TEACHING EXPERIENCE

In this section, we summarize the candidate’s experience in terms of helping others to grow professionally.

**2022** Supervised two Master’s students at Voi on the topic of identifying irresponsible, unsafe usage of electrical vehicles via sensor readings by means of outlier detection.

**2018–2019** Supervised two Master’s students at LeoVegas on the topic of identifying problem gamblers using recurrent neural networks and on the topic of managing promotion campaigns using reinforcement learning.

**2011–2017** Supervised one Ph.D. student and five Master’s students at Linköping University in machine learning, software engineering, and computer systems.

**2011–2017** Assisted in the following undergraduate courses at Linköping University: Design Patterns,<sup>ω</sup> Distributed Systems,<sup>ω</sup> Embedded Systems Design,<sup>ω</sup> Software Testing,<sup>ω</sup> and System Design and Methodologies.<sup>ω</sup>

## VI. LEARNING EXPERIENCE

In this section, we go over several noteworthy courses that the candidate has passed throughout the years.

**2022** Passed the Machine Learning specialization on Coursera (an updated classic by Andrew Ng) and hosted a “book” club for aspiring machine-learning practitioners at Voi.

**2018–2019** Passed the following specializations on Coursera: Deep Learning, Machine Learning with TensorFlow on Google Cloud Platform, and Data Engineering.

**2011–2017** Passed the following graduate courses at Linköping University: Advanced Data Models and Databases, Bayesian Learning, Data Mining and Statistical Learning, Distributed Systems, Gaussian Random Processes, Malliavin Calculus and Stochastic Integration, Natural Language Processing, Neural Networks with Applications to Vision and Language, Probability Theory, Real-Time and Embedded Systems, Stochastic Optimization, and Stochastic Processes.

## VII. ACADEMIC QUALIFICATIONS

In this section, the candidate’s formal education is given, which can be broken down into two periods: Saint Petersburg, Russian, until 2011 and Linköping, Sweden, from 2011.

**2017** *Doctor of Philosophy in Computer Science*, Embedded Systems Laboratory, Department of Computer and Information Science, Linköping University.

**2010** *Master of Science in Computer Science* with HONORS, Department of Information and Control Systems, Peter the Great Saint Petersburg Polytechnic University.

**2010** *Specialist in Business Management* with HONORS, International Graduate School of Management, Peter the Great Saint Petersburg Polytechnic University.

**2008** *Bachelor of Science in Computer Science* with HONORS, Department of Information and Control Systems, Peter the Great Saint Petersburg Polytechnic University.

## VIII. SELECTED SCIENTIFIC PUBLICATIONS

In this section, we list several notable scientific publications authored by the candidate, which were produced during his Ph.D. education; see Section VII.

**2017** *System-Level Analysis and Design under Uncertainty* [1]: In a Ph.D. dissertation, summarized and unified the individual pieces of research listed below.

**2017** *Fine-Grained Long-Range Prediction of Resource Usage in Computer Clusters* [2]: Studied resource usage in a computer cluster.<sup>ω</sup> Constructed an efficient pipeline for data processing and devised a recurrent neural network for forecasting resource usage. Made use of TensorFlow.

**2017** *Fast Synthesis of Power and Temperature Profiles for the Development of Data-Driven Resource Managers* [3]: Studied network traffic in a computer cluster.<sup>ω</sup> Developed an infrastructure for simulating systems processing user requests with the goal of providing large amounts of synthetic yet realistic data to facilitate the development of resource managers powered by machine learning.

**2017** *Probabilistic Analysis of Electronic Systems via Adaptive Hierarchical Interpolation* [4]: Developed an efficient framework for probabilistic analysis of electronic systems based on adaptive hierarchical interpolation on sparse grids. Leveraged advanced topics in numerical analysis.

**2015** *Temperature-Centric Reliability Analysis and Optimization of Electronic Systems under Process Variation* [5]: Developed an efficient probabilistic framework for reliability analysis of electronic systems using polynomial regression and applied this framework in the context of energy optimization.

**2014** *Probabilistic Analysis of Power and Temperature under Process Variation for Electronic-System Design* [6]: Developed an efficient probabilistic framework for temperature analysis of electronic systems under process variation based on polynomial regression. Made use of advanced topics in probability theory and numerical analysis.

**2014** *Statistical Analysis of Process Variation Based on Indirect Measurements for Electronic-System Design* [7]: Developed an efficient statistical framework for characterizing variations in parameters of a technological process based on indirect measurements. Made use of Bayesian inference.

**2012** *Steady-State Dynamic Temperature Analysis and Reliability Optimization for Embedded Multiprocessor Systems* [8]: Developed a fast and accurate technique for temperature analysis of multiprocessor systems under periodic workload and applied this technique in the context of reliability optimization. Made use of advanced linear algebra.

## IX. SELECTED OPEN-SOURCE PROJECTS

In this section, several of the candidate's open-source projects are given. Each item below corresponds to an organization on GitHub where the individual packages can be found.

*Stainless Steel (stainless-steel on GitHub)*:<sup>ω</sup> Developed a collection of Rust packages of general interest in such interrelated areas as linear algebra, probability theory, statistics, signal processing, and relational databases.

*Bodoni (bodoni on GitHub)*:<sup>ω</sup> Developed a collection of packages in Rust for working with vector graphics and font formats, including OpenType and Web Open File Format.

*Ready Steady (ready-steady on GitHub)*:<sup>ω</sup> Developed a collection of Go packages of general interest in such interrelated areas as linear algebra, numerical integration, interpolation, probability theory, and statistics.

*Markov Chain (markov-chain on GitHub)*:<sup>ω</sup> Developed a collection of Rust packages for high-level simulation of multiprocessor systems with an emphasis on their thermal dynamics, which was used in research; see Section VIII.

*Turing Complete (turing-complete on GitHub)*:<sup>ω</sup> Developed a collection of Go packages for high-level simulation of multiprocessor systems with an emphasis on their thermal dynamics, which was used in research; see Section VIII.

*Learning on Chip (learning-on-chip on GitHub)*:<sup>ω</sup> Developed a collection of tools in Rust and Python for processing, simulation, and prediction of dynamics in a computer cluster<sup>ω</sup> for research purposes; see Section VIII.

*Chain Rule (chain-rule on GitHub)*:<sup>ω</sup> Developed a collection of packages used in the personal blog<sup>ω</sup> about data science.

## X. PERSONAL INFORMATION

The candidate considers himself to be reliable, responsible, meticulous, and organized. He likes to think that he has high

standards for the written word and the written code. He claims to work well both in a team and individually.

The candidate is located in Stockholm, Sweden. He goes to the gym, likes photography,<sup>ω</sup> blogs about software engineering,<sup>ω</sup> and plays the piano, or rather aspires to. He enjoys typography and type design.

## XI. CONCLUSION

In this paper, we summarized Ivan Ukhov's profile so as to assist potential employers in evaluating the candidate's relevance for their endeavors. It is well understood, however, that the actual causal impact of the present format on the efficiency and effectiveness of the recruitment process remains unknown, which we leave for future work.

## REFERENCES

- [1] I. Ukhov, "System-level analysis and design under uncertainty," Ph.D. dissertation, Linköping University, December 2017.
- [2] I. Ukhov, D. Marculescu, P. Eles, and Z. Peng, "Fine-grained long-range prediction of resource usage in computer clusters," Linköping University, Tech. Rep., September 2017.
- [3] —, "Fast synthesis of power and temperature profiles for the development of data-driven resource managers," Linköping University, Tech. Rep., September 2017.
- [4] I. Ukhov, P. Eles, and Z. Peng, "Probabilistic analysis of electronic systems via adaptive hierarchical interpolation," *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems*, vol. 36, pp. 1883–1896, November 2017.
- [5] —, "Temperature-centric reliability analysis and optimization of electronic systems under process variation," *IEEE Transactions on Very Large Scale Integration Systems*, vol. 23, pp. 2417–2430, November 2015.
- [6] —, "Probabilistic analysis of power and temperature under process variation for electronic system design," *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems*, vol. 33, pp. 931–944, June 2014.
- [7] I. Ukhov, M. Villani, P. Eles, and Z. Peng, "Statistical analysis of process variation based on indirect measurements for electronic system design," in *Asia and South Pacific Design Automation Conference*, January 2014, pp. 436–442.
- [8] I. Ukhov, M. Bao, P. Eles, and Z. Peng, "Steady-state dynamic temperature analysis and reliability optimization for embedded multiprocessor systems," in *Design Automation Conference*, June 2012, pp. 197–204.