Farruh **Kushnazarov**

Lead Research Engineer

China/Shanghai

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As a senior solutions architect specializing in AI at Alibaba Cloud Intelligence, I am focused on generative AI, AI/ML/DL problem resolution, and information system development. With a Ph.D. in mathematical modeling, numerical methods, and computer programming, I am dedicated to advancing technologies such as computer vision AI and NLP. I have played vital roles in impactful data science projects at Midea and Ping'An, and my work, featured in leading conferences, seamlessly blends theoretical knowledge with practical applications in AI and communication networks.

Experience

Senior Solutions Architect

Hangzhou, China

Alibaba Cloud Global

April 2022 –> Present

- Provide Generative AI solutions using foundation models (LLM, Stable Diffusion, etc.) for business use cases.
- Building and integrating information systems related to AI and Big Data to meet the company' s needs
- Resolving technical Generative AI and AI/ML/DL problems as they arise
- Providing supervision and guidance to development teams
- Continually researching the current and emerging technologies in computer vision, NLP, etc, and proposing changes where needed
- Assessing the business impact that certain technical choices have
- Providing updates to stakeholders on product development processes, costs, and budgets

Lead Research Engineer

Foshan, China

Midea HBT

November 2020 –> April 2022

- Languages — Tensorflow, Keras, Python, SPARQL, Cypher, RDF, Ontology
- Use data science methods to work with domain experts to develop and implement data-driven solutions
- The work mainly involves data-driven predictive control, predictive maintenance, fault diagnosis, behavior pattern analysis, etc.
- Carry out including experimental design, data collection, data analysis, model building, model verification, model deployment, continuous Iteration, and other aspects of work
- Complete the data modeling analysis report, and carry out technical precipitation
- Read relevant literature and keep up with the latest developments in data science and business
- Interview the potential candidates for the data scientist team

Big Data & Data Scientist Manager

Shanghai, China

Ping An Hao Xue, under Ping An (平安) China

September 2016 –> November 2020

- Languages — Python, Tensorflow, Keras, R, RMarkdown, SQL, Spark and Hive
- NLP: have done projects like text classification, sentiment analysis, and text summarization.
- Implemented and retrained Mozilla DeepSpeech library for Automatic Speech Recognition
- Created and tested the Speech Accent Classification System for native and non-native speakers, with a rate of 99% in metric recall
- Conducted classification analyses of the customer life cycle stage to increase overall turnover
- With algorithmic, optimized ongoing ML/DL models and checked the performance of implemented models
- Established the Machine Learning model for refund customers and updated the refund model. Decreased the overall refund rate to 27%

Automatic Driving Prospective Technology Engineer

Shanghai, China

Haima automatic Investment Group Co. Ltd, R&D Center

April 2016 –> September 2016

- Languages — C/C++, Python and Bash
- Connected lidar and radar to decrease noises in raw data
- Designed a model car to check the capability of algorithms on ultrasonic sensors
- Optimized CANBus protocol to increase the efficiency of data transfer
- Optimized joint work and logic compatibility of equipments

Senior Programmer, Data Analyst

St Petersburg, Russia

Domus Sapiens

October 2012 –> May 2015

- Languages — C/C++, Assembler and Bash
- Lead and managed more than 20 projects on intelligent systems. Some of the most famous and complicated cases are the Moscow Smart Lighting Projects
- Moscow Smart Lighting Projects were to do with five high buildings with various styles and functions, including office buildings and hotels. The requirements were not even similar from floor to floor, which made the whole projects equivalent to establish a small smart city system. We successfully finished the projects and because of this, Domus Sapiens got several rewards
- Implemented and applied the patent model to improve the quality of data transfer in wireless networks

Software Engineer

Tashkent, Uzbekistan

ProDVD

October 2010 –> March 2012

- Languages — C/C++
- Developed the Card King for mobile phones, compatible for both Android and iOS systems, making it convenient for business people to organize and store business cards
- Developed the audio encoding/decoding part for the Blu Ray player
- Invented the word recognition software, both iOS and Android compatible

Assistant of Professor

Tashkent, Uzbekistan

Tashkent State Transport University

September 2010 –> July 2012

- To conduct laboratory and practical classes for below subjects:
- Programming in C/C++ languages;
- Network & communication systems on the railway;
- Information systems on railway transport
- To assist the professor in research work, create application parts, and simulation parts of analytical models

Education

Emperor Alexander I St.Petersburg State Transport University

St Petersburg, Russia

Mathematical modeling, numerical methods and computer programs

September 2012 –> March 2016

- Doctor of Philosophy (Ph.D.)
- Research Field: Develop data transmission methods for evaluating the real speed of data link layer protocols, which aimed at improving hardware and software components

Emperor Alexander I St.Petersburg State Transport University

St Petersburg, Russia

Information systems and technologies

September 2008 –> June 2010

- Degree: Master of Science
- Research Field: Develop and optimize computer network systems

Emperor Alexander I St.Petersburg State Transport University

St Petersburg, Russia

Information systems and technologies

September 2004 –> June 2008

- Degree: Bachelor of Computer Science
- Research Field: Develop and optimize computer network systems

Data Science Skills

Communication

Communicate effectively with wide-range of audiences, presentations (technical and non-technical), dashboard design, data analysis reports, scientific publications and data visualization

Programming/Markup Languages

Python, R, SQL/NoSQL, Hive, Spark, C/C++, Matlab, BASH, CSS, HTML, LaTeX, Markdown and RMarkdown

Software Development

Docker, git, version control, automated testing and continuous integration, A/B testing (Statistical Testing and Experiment Design)

Numerical Methods

optimization (stochastic, genetic, multi-start) and numerical solution of differential equations

Statistics

Machine learning, data analysis, generalized linear regression, cluster analysis, factor analysis, principal components analysis (PCA), cross validation, generalized additive models, data analytics

Environments

Linux, Jupyter-Lab, PyTorch, RStudio, ETL, SQL Server Management Studio, Azure Data Studio

Publications

1. Li, J., Li, N., Yue, B., Yan, R., Kushnazarov, F., Li, A., & Li, K. (2022). Research on the semantic web representation for building operation with Variable Refrigerant Flow systems. *Journal of Building Engineering*, *56*, 104792. https://doi.org/10.1016/j.jobe.2022.104792
2. Isakulovich, K. F., & o'g'li, N. J. A. (2022). TEXT SUMMARIZATION VIA DEEP LEARNING. *E Conference Zone*, 130–134. https://www.econferencezone.org/index.php/ecz/article/view/142

3. ZHAO, D., FAN, B., & Kushnazarov, F. (2021). Anomaly detection of unitary air conditioners based on isolation forest method/基于孤立森林方法的单元式空调器异常检测. *Chinese Journal of Refrigeration Technology/制冷技术*, *183*. https://scjg.cnki.net/kcms/detail/detail.aspx?filename=ZLJS202103007&dbcode=CJFQ&dbname=CJFD2021&v=

4. Li, J., Yan, R., Farruh, K., Li, A., & Li, K. (2021). *Research on brick schema representation for building operation with variable refrigerant flow systems*. https://arxiv.org/abs/2108.07037

5. Kushnazarov, F. (2019). Data stream controlling in communication channels with noise. *2019 IEEE 4th International Conference on Cloud Computing and Big Data Analysis (ICCCBDA)*, 534–538. https://ieeexplore.ieee.org/abstract/document/8725672

6. Kushnazarov, F. et al. (2019). Consumer life cycle and profiling: A data mining perspective. In *Chapters*. IntechOpen. https://www.intechopen.com/books/consumer-behavior-and-marketing/consumer-life-cycle-and-profiling-a-data-mining-perspective

7. Kushnazarov, F. (2018). Throughput of communication protocols for distributed systems transferring a group of frames under noise. *2018 IEEE 3rd International Conference on Cloud Computing and Big Data Analysis (ICCCBDA)*, 424–429. https://doi.org/10.1109/ICCCBDA.2018.8386554

8. Kushnazarov, F. I., & G., B. V. (2018). Directions of development of the corporate information system of the company «uzbekiston temir yullari». *Intellectual Technologies on Transport*, *3 (15)*, 12–18. http://itt-pgups.ru/issue/download/182/76

9. Kushnazarov, F., & Yakovlev, V. (2017). Control of exchange messages in a noisy channel. In *Proceedings of the FRUCT'18* (pp. 18–22). IEEE Explore Digital Library. https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=7561561

10. Yakovlev, V., & Kushnazarov, F. (2017). *Organization of work with cloud services* (1st ed., p. 43). FGBOU VO PGUPS.

11. Kushnazarov, F. (2017). Analysis of perfomance of algorithms for scoring system in organization of customer profiles. *2017 IEEE 2nd International Conference on Big Data Analysis (ICBDA)*, 281–285. https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=8078680

12. Kushnazarov, F. I., & Kushnazarov, F. I. (2016). Analysis of the data transmission in communication channels with noise. *Prace Naukowe Politechniki Warszawskiej. Transport*. https://www.wt.pw.edu.pl/content/download/6398/35819/file/Farruh%20I%20Kushnazarov,%20Firdavs%20I%20Kushnazarov.pdf

13. Kushnazarov, F. (2016). *Development and research of models of performance evaluation of communication protocols for channel with noises* (p. 159) [PhD thesis, Emperor Alexander I St. Petersburg State Transport University; FGBOU VO PGUPS]. https://www.dissercat.com/content/razrabotka-i-issledovanie-modelei-otsenki-proizvoditelnosti-kommunikatsionnykh-protokolov

14. Yakovlev, V., & Kushnazarov, F. (2015). Model of repeated channel transmission, against interference. *Proceeding of Petersburg Transport University*, *1*(12), 133–138. http://www.nauteh-journal.ru/files/05120b85-ba16-435d-8835-0e2d3b612410

15. Yakovlev, V., & Kushnazarov, F. (2015). Evaluation of the effect of interferences on link-layer protocol performance. *Proceeding of Petersburg Transport University*, *1*(42), 133–138. http://izvestiapgups.org/archive/2015/2015-1.html

16. Kushnazarov, F., & Yakovlev, V. (2015). *The protocols performance evaluation of the data link layer in the ISO/OSI model* (Patent No. RU 2015619739). https://patentinform.ru/programs/reg-2015619739.html

17. Kushnazarov, F. (2015). Controlling data flows in the noisy channels. *Intellectual Technologies on Transport.*, *1*(1). http://itt-pgups.ru/issue/download/151/17

18. Kushnazarov, F. I. (2015). Analysis of interference in the communication channels to the real speed of data transmission. *Transport: Problems, Ideas and Perspectives. Science Week - 2015*, *1*, 25–27.

19. Kushnazarov, F. I., Yakovlev, V. V., & Turdiyev, O. A. (2015). Comparison of the performance of protocols of access to cloud resources. *Proceeding of Petersburg Transport University*, *4 (45)*, 115–120. http://izvestiapgups.org/assets/files/10.20295-1815-588X-2015-4/10.20295-1815-588X-2015-4-117-123.pdf

20. Кушназаров, Ф. И., Турдиев, О. А., & Кушназаров, Ф. И. (2015). ЭФФЕКТИВНОСТЬ ЦИКЛИЧЕСКИХ КОДОВ ПРИ ПЕРЕДАЧЕ ДАННЫХ в КАНАЛАХ СВЯЗИ с ПОМЕХАМИ. *Сборник Трудов VII Научно-Практической Конференции Молодых Ученых*, *73*. mr.ifmo.ru/files/Sborniki/sbornik_2016.pdf

21. Kushnazarov, F. (2013). Decoding information flows by viterbi. *Ransport: Problems, Ideas and Perspectives. Science Week*, *1*(1).

Projects

NLP: Speech Accent Detection

Project Link

Everyone who speaks a language, speaks it with an accent. This project defines accents for the english language speakers

2020

- Role: Author and Maintainer
- Results: Accuracy=.90, Recall=.91 and Precision=.93
- Increase accuracy of ASR (Automatic Speech Recognition)

NLP: Text classification

Private

Classified to 10 different topics

2019

- Data sources: Title, Description, Text
- Method: LDA
- Result: 10 topics. Accuracy=.87

Moscow Smart Lighting Projects

Project Link

Moscow Smart Lighting Projects Project, which is made by 5 different office building groups with different requirements to smart system and linking. Companies main job is to make computer programming of center control and night light adjustment. More then 800 square meters, with 15000 signals from different controllers

2015

- Maintainer

L-Cube

Company WebPage

Implemented at the company L-Cube LLC in order to optimize the performance of the departmental network

2015

- Author and Maintainer

EMC-DELL

Implementation Certificate

Certificates from EMC2 Data-Center about Value of Research and Possibility of Implementation the Model

2016

- Author and Maintainer

IntellektTrans

Conference WebPage

Intelligent rail system transportation summit. As one of the members of the Organizing Committee of the intelligent rail system transportation summit, the organization participated in the summit and attended the meeting

2009

- Volunteer

Accomplishments

2021	Accelerating End-to-End Data Science Workflows	*Nvidia-Deep Learning Institute*
2020	IBM Data Science	*IBM*
2020	Mathematics for Machine Learning: Multivariate Calculus	*Imperial College London*
2020	Mathematics for Machine Learning: Linear Algebra	*Imperial College London*
2017	Big Data 101	*Big Data University*
2016	Data Mining	*Intuit National Open University*
2013	Certificate of knowledge of technology AMX I - II level	*Smart City and IoT*
2013	Certificate of knowledge of ABB technology I-III	*Smart City and IoT*
2013	Certificate knowledge of technology Crestron I - II level	*Smart City and IoT*
2012	Data Science - effective use of data	*DELL-EMC*
2012	ISM - administration of information and data storage	*DELL-EMC*
2012	The C Programming Language	*Intuit National Open University*
2007	Fundamentals of IBM z Series	*IBM*