Pavel Aitkulov

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○ Experienced Software Engineer with a strong track record solving business problems using advanced algorithms, machine learning, and functional programming
○ Proven ability to design and implement optimized data pipelines, perform data analysis, and deploy machine learning models in a production environment

Experience

07.2023–now — **Senior Software Engineer**, *Disney Streaming, Santa Clara, CA*
AdTech, infrastructure, big data
- ○ Designed and implemented internal web applications to manage pipelines and provide customer reports, 40-50Tb data per day, 400+ clients.
- ○ Migrated legacy services to Spinnaker/Helm/k8s CI/CD pipeline.
Technologies: Scala, Java, Python, AWS, Airflow

01.2020– 04.2023 — **Senior Software Engineer**, *Dun & Bradstreet, San Jose, CA*
Company profiles, B2B. Data Engineering, Fuzzy search, Clustering
- ○ Increased search hit rate by 4% by developing Spelling correction module. Applied Trie as BloomFilters, Count-min-sketch for language models. $7M$ unique words, $55M$ pairs, $55M$ triples.
- ○ Researched and developed a de-duplication method for $450M$ company profiles. Locality sensitive hashing, MinHash, Trie as BloomFilters for Hamming distance. Found 7M exact and fuzzy duplicates.
- ○ Implemented Verification and Identification services that match web domains to companies. $60M$ websites scale.
Technologies: Scala, Python, Postgres, ML, AWS

07.2014– 01.2020 — **Senior Software Engineer**, *Piano Media, Izhevsk, Russia*
Platform for paywall and subscription business. Distributed systems, ML, Reports, DSL, Streaming. 200 Tb data in total, $5000\,rps_{avg}$, $8000\,rps_{peak}$ daily.
- ○ Launched Likely-to-Subscribe and Likely-to-Churn ML projects, $10M$ users
- ○ Led and built a project that provides various types of analytic reports, real-time, on-demand, customizable reports based on DSL. Connected Clojure-based DSL with Spark and BigQuery.
- ○ Implemented User Segmentation Engine, $100M$ users, used Bloom filter as KV-store
Technologies: Scala, Clojure, Unix, Spark, HDFS, DSL, AWS, Akka, Kafka, Catboost, BigQuery

08.2013– 07.2014 — **Researcher, Senior Algorithm Engineer**, *Huawei Research, Moscow, Russia*
Nested data parallelism model, distributed systems, map-reduce, optimization compiler, meta-programming and code generation, domain specific languages
- ○ Implemented Spark backend for nested data-parallelism model
- ○ Researched and developed efficient custom Spark RDD's for NDP-primitives
Technologies: Scala, Spark, Distributed Programming, C++

12.2007– 08.2013 — **Senior Software Engineer**, *Rosneft, Izhevsk, Russia*
Oil mining, forecast, and monitoring system. OLAP, up to $2M$ data points per document, up to 15 dimensions, DSL, Calculations
- ○ Increased calculation speed by 3.5 times using multithreading evaluations
- ○ Pioneered testing and verification via Partial evaluation
Technologies: C#, Multithreading, DSL, Partial evaluations

Education

2010 — **Ph.D.**, *Udmurt State University, Institute of Control Sciences V.A. Trapeznikov Academy of Sciences*, Izhevsk, Moscow, Russia
Key words: online string algorithms, string matching, text indexing, dynamic suffix arrays, data compression. Advisor: prof. Nepejvoda N. N.

2006 — **MS in Computer Science**, *Udmurt State University*, Izhevsk, Russia
Summa cum laude. Master thesis: Limited proof programming (Floyd-Hoare logic, annotated program, static verification, compiler)

CS Interests

graph theory, number theory, formal languages, string matching, data structures

domain-specific languages, functional programming

Skills

Data	Spark, Druid, Kafka, Pulsar, Rabbitmq, Big Query, Akka, SQL, Clickhouse, Airflow	ML	LogReg, CatBoost, Transformers
Infrastructure	AWS, S3, EC2, LB, ECS, Docker, Spinnaker, k8s, Helm	Culture	Tests, CI/CD, Code Reviews, Dashboards, Monitoring, Tech Lead for a team of 3

ACM ICPC

coach	2012, World Final, Poland, Warsaw	participant	2005, 2006, NEERC

Schools and conferences

DSLDI 2015	Summer School on DSL Design and Implementation, Aug 2015, Lausanne, Switzerland
EWSCS 2014	Estonian Winter School in Computer Science, Mar 2014, Palmse, Estonia
ALMADA 2013	School on Algorithms for Massive Data, Aug 2013, Moscow, Russia
Russir 2011	Russian Summer School in Information Retrieval, Aug 2011, Saint Petersburg, Russia
SSSEV 2011	Summer School in Software Engineering and Verification, Jul 2011, Moscow, Russia
Russir 2010	Russian Summer School in Information Retrieval, Sep 2010, Voronezh, Russia
conferences	HighLoad++-2019, HighLoad++-2015, HighLoad++-2014, META-2016, META-2014, NSKF-2013, NSKF-2014, ULMCAMP-2014, Scalar-2017, STACHKA-2017, LambdaWorld-2017, f(by)-2017, Scalar-2018, Scalar-2019, f(by)-2019, f(by)-2020, fpure-2019, PyBay-2022

Main publications

D. V. Urbanovich, P. G. Ajtkulov, "Simple algorithm to maintain dynamic suffix array for text indexes", RuSSIR/EBDT, (2011), 40-45.

P. G. Ajtkulov, "Symbol array processing", UBS, 28 (2010), 126-178. (rus)

Talks

HighLoad-2019	Probabilistic data structures, https://www.youtube.com/watch?v=Vx-l7KiIYuM, https://www.highload.ru/moscow/2019/abstracts/5944
EWSCS 2014	19th Estonian Winter School in Computer Science, http://cs.ioc.ee/ewscs/2014/index.php?page=../talks Online Suffix Array Construction

Collaboration

Dissernet	https://www.dissernet.org/ Plagiarism detection in Ph.D. theses and articles in Russia. Algorithms on strings, text, and table data analysis. ML/NLP, 1.2M theses and 2.6M articles, 500Gb raw texts. Extra 2000 stolen dissertations and more than 40, 000 articles were founded.

Misc

Translator	Foundations for Programming Languages, John C. Mitchell. RCD press, 2010
Running	Marathon: 3h22m, $\frac{1}{2}$ marathon: 1h38m, 10km: 40m38s
Chess	Max Elo: 2118