

Dr Alexander Mikhalev

Personal Details

Summary: Experienced technical leader with unique combination of skills in innovation with focus on data, engineering and machine learning. Capable of taking innovation from idea to production by building full platform with whole lifecycle and corresponding organisation

Key strengths/Core Attributes:

Management: Created and managed teams in Agile/Waterfall and mixed environments using Ultimate Kanban and Reliable Scrum and transparent performance metrics, for example:

Shopitize Ltd: Managed team of up to 32 in 4 locations, transition to team of 6

Nationwide: Lead teams of Technical architects (2 -12) on large projects like GDPR, Open Banking, CMA, Mobile app

Leadership and Innovation: Leader as a coach, mentoring and inspiring my team members to innovate:

Nationwide: Created and prototyped new type of distributed infrastructure to deploy machine learning models on commodity devices

Sponsored, mentored and lead team member to create a first patent in Nationwide using blockchain inspired design

Inspired Accenture consultant on DevOps project to come up and prototype Architecture as a Code (DevOps)

Shopitize Ltd: our own search engine for string matching (part of Intellectual Property)

Mentored and lead teams of data scientists

Data Science and Analytics: Experienced Data Scientists and mentor, leveraging expertise across multiple industries to build novel solutions

Specific examples: In Cranfield University developed a novel data fusion technique based on image processing. Resulted in hundreds of high-performance algorithms for data fusion from multiple sensors also in Cranfield University invented new type of waveform for communication based on wavelet-packets

Deep Learning Neural Network classifier for Therapy Box to detect learning disability in child speech

Systems Engineering/Software Engineering: Systems Engineering thinking is a foundation of my activity, this allows me to quickly navigate in complex project, drive new strategies for business, develop new architectures taking it from conceptual level to production with necessary automation (DevOps/DataOps) and corresponding team. I also can code my ideas into pipelines or services using Python/Lua/Java/Matlab/Rust/Go:

Short contracts for startups: Memrise: Java/Spark Machine learning pipeline for communications (2 weeks contract) ThirdEye: Kubernetes/Tensorflow based pipeline for video recognition (1-week contract)

Nationwide: Python/Pytorch Machine learning for data non-compliance monitoring

Innovation & Entrepreneurship: I have a systematic way to innovate by challenging common assumptions using Theory of Creative Problem solving

(TRIZ) and Theory of Constraints (TOC), enabling business to create disruptive strategies:

Shopitize Ltd: Created a distributed cache for mobile API. This cache removed dependency on IT infrastructure for scalability, only business cashflow became limited factor (constrain)

Nationwide: By observing challenges to deliver data compliance proposed a Machine Learning technique to monitor data compliance. Potential savings 80 million per year (without taking fines into account)

Nationwide: Invented new type of the infrastructure: leveraging members device to store data, solving challenges of security, compliance, availability and resilience

Experience

Financial Services

AI/ML Architect, Data Architecture team, Nationwide Building Society, Swindon, June 2018 - present

AI/ML architect, working closely with innovation and venturing team and data&analytics community. Specifically working on privacy preserving techniques for machine learning models, synthetic data and digital twins.

Lead Entrepreneur/ Head of Prototyping Engineering/Principle Engineer. Prototyping Engineering team, Nationwide Building Society, Swindon, June 2017 - 2018

Enabled Prototyping Engineering capability inside Nationwide. Lead the team to create prototype of new infrastructure to build a digital distributed organisation - powered by blockchain and Machine Learning algorithms. We have invented and in patented the new type of distributed storage, which is complementary to existing cloud/on-prem infrastructure. I also personally contributed to AI and Blockchain strategies.

Lead architect. Accelerate Change Efficiency DevOps, Nationwide Building Society, Swindon June 2016 - June 2017

Performed the role of lead architect on Accelerate Change Efficiency DevOps programme, where I shaped DevOps Enterprise blueprint proposed common value metric for enterprise to track consistently (cashflow per day) and created a proof of concept demo for Architecture as a Code.

Tech Lead/Lead Technical Architect, Nationwide Building Society, Swindon November 2014 - June 2017

Background:

One of the most traditional Building Society, with a strong focus on members and attitude to become a fully digital society.

I lead a team of Technical Architects to produce systems designs for a large number of strategic initiatives: Next Generation Banking App, Strategic Origination, Risk Profiling, CMA 1.1, Open Banking (PSD2), Information Management Strategic Architecture, Treasury Technology and Enhanced Third Party Controls project to name a few. I have provided input into Technology strategy and influenced enterprise architects in corresponding areas. I have won Raspberry Pi IT Architecture challenge by presenting a solution to use Machine Learning to monitor data compliance in relation to PCI and GDPR regulatory requirements

Key achievements:

- Drive a Technical Architecture/Design of the change projects in complex and high-pressure environment
- Lead, coach and supervise a Team of Technical Architects/Designers working across multiple projects
- I collaborated with Enterprise Architecture to make sure projects solutions are delivered in line with Enterprise Strategy for Society
- Lead a process to make sure technical debt delivered by projects is minimised
- Implemented Technical Quality Assurance and Governance of artefacts and build products from outsourced partners (IBM, Accenture and TSC) to ensure deliverables are meeting Nationwide standards
- Enforce regulatory standards: CMA/PSD2/PCI DSS 3.2 to ensure project solutions will maintain compliance.

Startup: Head of Architecture and Development, Shopitize Ltd, London UK
November 2011 – November 2014

Responsibilities:

I have been the most senior technology professional in Shopitize my goal was to align business strategy with technology and product development.

Key achievements:

- I actively contributed to increasing Shopitize company valuation by 40 times during my term of employment.
- Advanced distributed system architecture design and implementation: I have designed and overseen implementation of fully automated receipts processing system based on advanced image processing and OCR technologies. The innovative architecture, technical and business processes resulted in the patent application "A method and a system for providing loyalty program" of which I am one of the primary inventors.
- I also designed scalable, secure and high-performance architectures for advanced data processing, middleware layer and cost-effective hardware infrastructure capable of serving millions of customers per day using a mix of public and private cloud with dedicated hardware. REST API for mobile and web clients, Publish/Subscribe architecture for back-end processing, SOAP/XML based services for integration with BACS and Paypal processing.
- Product search engine specifically build to replace Solr (Lucene-based search engine), which outperform Solr 10 times regarding speed of indexing
- Mentoring and managing Data Scientists: our technology solution has been evaluated, and even our competitors conclude that we are one of the most robust and scalable platforms in our industry, generating unique dataset and leveraging Big Data Technology using COTS components. I have also mentored my team members as well as Science to Data Science school participants to achieve distinguished results and be able to present results to stakeholders
- Team management and innovation: I managed a team of up to 32 engineers and designers, including three architects - UX, mobile and middleware located offshore, then hired and build a strong, high performance and innovative in-house team limited to 5 engineers.

Technology stack used: Middleware: Python, Django, Rabbit MQ, Riak, PostgreSQL, Mongo DB, various Machine Learning Libraries. Front-end: Javascript, jQuery, Knockout JS, Ember JS/Angular JS

Researcher: Research Fellow, Wireless Networks and Communication Group,
Defence College of Management and Technology, Cranfield University, UK
May 2007 – November 2011

The main achievement during 2007-2009 was the development of the new water-filling waveform for mobile communication band-sharing on a physical layer using wavelet packets and implementing it in hardware (Anritsu Vector Generator and Analyser). Another project was to develop novel methods of communication for in-vehicle sensor networks funded by IVHM consortium led by Rolls Royce and Boeing which was also completed, presenting new methods for simulations of in-vehicle communications. In-Vehicle Health monitoring in Aerospace is a Big Data problem and although not advertised as such presents common Big Data challenges, where communication network is the main bottleneck in data processing.

IT/IS Executive, Microsharp Corporation Limited (previous name: Durand Technology Limited), UK February 2003 - May 2007

Design, development and testing of IT and phone infrastructure of the company, created fully automated and redundant IT infrastructure.

Entrepreneur: Co-founder and Editor-in-chief, "System Administrator" magazine for system administrators (Russia), September 2002 - February 2003

Responsible for developing and controlling the publishing process for the magazine. Management and development of the offline magazine. The position of the editor-in-chief was not editorial, but managerial. Responsibilities included the management of a small team (5-8 employees) and made sure the magazine would be delivered to the publisher on time.

Engineer - Developer Ross Business Consulting, Russia — 04.2002-09.2002

Responsible for development of web portals, including portals for the Russian Ministry of Energy and several oil companies.

Web-developer, Publish house "Pushkin Square" (Russia) — 4.06.2000-19.04.2002

Extra Achievements

2 patent applications

Over 20 publications in peer-review journals including Best Student Paper Award "A. Mikhalev and R.F. Ormondroyd, Emitter Geolocation using a fusion of TDOA Data with a Particle Filter, in Student Papers. The International Conference on Information Sciences, Signal Processing and its Applications February 2007, Sharjah, UAE."

Technical Skills

Knowledge of Standards: TOGAF 9.1, Zachman, ISO 42010, ISO 15288, ISO 15926, ISO 29148, Open Group Essence/SEMAT

Expert developer in Python, Matlab/Octave, Julia. Intermediate level in Java/Scala/Ocaml/Go/Rust

Virtualisation experience using RHEL, Debian, Ubuntu, LXC/Docker, Virtual Box, Vagrant, Chef, Ansible

Development process engineering and management using Lean, PRINCE 2, Agile/ Scrum/Kanban, Critical Chain Project Management, P2M

NoSQL Databases: Blockchain/Solidity, Blockchain/Dapp, Basho Riak, CouchDB/Couchbase, MongoDB, Redis, Cassandra

NoSQL (non-structured) text processing: Lucene/Solr, ElasticSearch/Kibana, Hadoop/Spark, Berkeley DB/Perl based search engines before 2004

Search Engines and Intelligent systems. Natural Language Processing, Advanced Image processing and Recognition.

Advanced SQL skills: Postgres SQL, MySQL, MS SQL,

Wireless and Wired Infrastructure: I have advanced knowledge of Network Ethernet 10/100/1000, TCP/IP, Token Ring, ARINC 429/629, MIL-STD-1553. Routing protocols OSPF/BGP. Wireless networks: IEEE 802.11*, IEEE 802.15.4, Mobile: 3G, CDMA, HSDPA, 3GPP - aware location services, WiMAX, Mobile bandwidth and spectrum management.

Scientific interests: Higher Order Statistics, Image Processing, Statistical Analysis, Sensor Fusion, Geolocation, Cognitive Systems, Distributed Computing, Large Scale Text Processing, Evolutionary Computations, Large Scale Data Processing, High-Performance computing, Internet of Things

Education

PhD in Wireless Networks, Defence College of Management and Technology, Cranfield University, UK — 2004–2010

Thesis title "Image Processing and Agent-Based framework for the Geolocation of Emitters" PhD thesis was concerned the novel use of the image processing technique (Hough Transform) for geolocation non-line-of-site emitters for military and emergency applications and comparison with Particle filter algorithm, which leads to a more generalised estimator. This work resulted in multiple publications in peer-reviewed journals and conferences.

MSc (Engineer) in Information Systems and Computer Science, Moscow State Technical University n/a Bauman (MSTU), Russia — 1996–2002

Master's thesis: "Semantic Search System for Large-Scale Hypertext Libraries on Compact Discs"