

# Michael Neumann

NTECS Consulting

+49 (163) 960 1039  
mneumann@ntecs.de  
www.ntecs.de



## Specialization

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- Software development with C, C++ and Rust (including embedded / Firmware).
- Frontend development with Javascript, Typescript and React.
- Android app development with Kotlin, React Native, Java, HTML5.
- Backend development with Rust, Ruby, PostgreSQL.
- Performance analysis and optimization of architectures, code and databases.
- Algorithm and protocol development.
- Consulting, open-source software.

## Skills

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- **Industries:** Energy, Finance, Stock-Exchange, Life Science/Chemical Analysis, IIoT, Advertisement, Risk-Management, HR, Transportation
- **Programming languages:** Rust, Ruby, Python, Typescript, Javascript, C++, C, C#, Kotlin, Java, Erlang, CSS3, HTML5, Smalltalk, SML, Pascal, Perl, PHP, Scala, Go, Assembler (x86, ARM, 68000)
- **Frameworks:** SolidJS, Odoo, React, React Native, ExpressJS, Ruby on Rails, nodejs, jQuery, Android, Django, JSP, ASP.NET, .NET Core
- **Databases:** PostgreSQL, Sqlite, MySQL, LMDB, ODBC, DB2, Oracle, PL/SQL, SQL, HyperTable, NoSQL, Redis, memcached, MS SQL Server
- **Platforms:** Linux embedded, Linux, FreeBSD, MS Windows, MS-DOS, MacOS X, RTOS, Enea OSE, Azure
- **Data communication:** MQTT, TCP/IP, Internet, Intranet, SOAP, JSON, XML-RPC, HTTP, MessagePack, Thrift, zeromq, SMTP, IMAP, LDAP, Siren Hypermedia
- **IDEs:** Netbeans, Cincom ObjectStudio (Smalltalk), Microsoft Visual Studio 2012/2015/2017/Code, Eclipse, JBuilder, Atom, vim, Android Studio, IntelliJ IDEA
- **Tools:** github actions, git, subversion, CVS, Jenkins, make, CMake, SoftCM/HMS, Apache, nginx, LaTeX, MS Office, Nuget
- **Methods:** CI, DDD, Scrum, Test-Driven Development, UML, Agile, XP, Kanban, Open Source
- **Languages:** German (mother tongue), English (fluent), French (basics), Persian (basics)

## List of Projects

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### Software-Developer

*EnBW*

**remote / Karlsruhe**

*April 2022 – now*

Implementing and extending a trading system/algorithm for stock-quoted electricity products in Rust. Backtesting.

Languages Rust

Technologies AWS S3/EC2, Deutsche Börse M7, Trading

### Software-Entwickler

*CelticGold AG*

**remote**

*December 2021 – now*

Development of an Odoo module for acquiring cryptocurrency payments via Kraken (payment acquirer). Development of an Odoo module for shipping via Deutsche Post API (delivery).

Languages Python, Javascript

Technologies PostgreSQL, Odoo / OpenERP, FastAPI, Microservices

### Software-Architect

*INTI, AG i.G.*

**remote**

*December 2020 – now*

Development of an online gold/cryptocurrency exchange. Full-Stack.

Languages Rust, Ruby, Javascript, Typescript

Technologies Event Sourcing, PostgreSQL, Crypto, SolidJS, Trading/ Order Matching

### Software-Developer

*Software AG, Darmstadt*

**remote**

*December 2020 – July 2021*

Development of embedded software (thin-edge.io) for distributed devices in industry (IoT device management, cloud connectivity). Support the development team with Rust in embedded Linux environment.

Languages Rust

Technologies Industry IoT, MQTT, Cloud

Platforms Linux, Embedded

### Fullstack-Developer

*Aizu Ltd*

**remote**

*March 2020 – now*

Development of back/frontend of aizu.uk.

Languages Rust, Javascript, Typescript, SQL

Technologies PostgreSQL, Redis, Microservices, Svelte

Tools git

Platforms Linux, Web

**Software-Developer***LTG via Bluehands***Karlsruhe / remote***January 2020 – March 2020*

Development, maintenance and testing of a public transportation passenger information system. Temporary replacement for a colleague.

Languages	C#
Technologies	.NET, ASP.NET core, Mono, SOAP
Tools	git, Azure DevOps, Nuget
IDEs	MS Visual Studio 2017
Platforms	MS Windows, .NET, Azure, Linux, Embedded

**Software-Developer***Open-Xchange***Finland / remote***August 2019 – November 2019*

Development and maintenance of open source project deltachat-core-rust ("chat over IMAP").

Languages	Rust, C
Tools	github
Platforms	Linux

**Software-Developer***MaidSafe***remote***December 2018 – now*

Research and Development in the field of evolutionary neural networks and machine learning. ▷ Evolvable Substrate Algorithm for Compositional Pattern Producing Networks..

Languages	Rust
Technologies	Evolvable Substrate, Evolution, Compositional Pattern Producing Networks, Neural Networks

**Software-Developer***LTG via Bluehands***Karlsruhe / remote***July 2018 – August 2019*

Development, maintenance and testing of a public transportation passenger information system.

Languages	C#, C++
Technologies	.NET, ASP.NET core, DirectX, OpenGL, Mono, SOAP, Docker, Skia, Harfbuzz
Tools	git, Azure DevOps, Nuget, Docker
IDEs	MS Visual Studio 2017
Platforms	MS Windows, .NET, Azure, Linux, Embedded

**Software-Developer***Bluehands GmbH & Co.munication KG***Karlsruhe***April 2018 – July 2018*

Developing a client/server application for the verification of the authenticity of products using a spectrometer.

Languages	C#, T-SQL
Technologies	ASP.NET core, MS SQL Server, WPF, Siren, Azure Blob Storage
Tools	git, MS VS Team Services, Nuget
IDEs	MS Visual Studio 2017
Platforms	MS Windows, .NET, Azure

**Software-Developer***Dr. Armin Roehrl***Remote***November 2017 – March 2018*

Optimizing a crypto-coin trading platform. Optimizing the trading algorithms.

Languages          Javascript (NodeJS), Rust

**Software-Developer***Agilent Technologies via Ferchau Engineering***Waldbronn***July 2016 – July 2017*

Developing software components of a web-application (server/firmware, client, Android app) for the purpose of monitoring, controlling, diagnostics and maintenance of Agilent HPLC moduls ▷ Implementation, documentation, testing and bug-fixing of Javascript/Typescript componenents ▷ Development of testing strategies ▷ Extending the client/server interface (HTTP/JSON) in firmware ▷ Implementing an Android app (Kotlin).

Languages          Typescript, C++, Kotlin, Javascript, Java, C#

Technologies      React, Redux, JSON, HTTP, Websockets, CSS3, HTML5, Responsive, USB, Anko, Canvas

Tools                CMake, git, npm, yarn, Gradle, Jira, Jenkins, Greenhills, Sass, HP SoftCM, Kanban

IDEs                 Visual Studio 2012/2015/Code, Android Studio, IntelliJ IDEA, vim

Platforms          Android, Browser, Firmware (embedded), Enea OSE, Win32, KNOX

**Consultant***Alfred Pracht Lichttechnik GmbH***Remote, Karlsruhe***November 2016*

Technology consulting of web-based solution

Languages          Typescript, Javascript

Technologies      HTML5, CSS3, Mithril, nodejs, JSON, HTTP

Tools                git, npm

Platforms          Browser, Server

**CTO, Architect, Developer***KarmicHub***Remote***May 2015 – May 2016*

Design and implementation of the internet platform KarmicHub ▷ Prototyping ▷ Database design ▷ REST interface specification ▷ Backend implementation (Rust) ▷ Design and implementation of frontend (Javascript) ▷ Testing.

Languages          Rust, Javascript

Technologies      React, Mithril, JSON, REST, nginx, LMDB, HTML5, CSS3

Tools                git, npm, bower, grunt, gulp, cargo

Platforms          Browser, FreeBSD, DragonFlyBSD

**Consultant, Architect, Developer***Simplifi Holding***Remote, Forth Worth (USA)***January 2013 – October 2015*

Developing and optimizing a mission-critical system ▷ Design and implementation of a real-time bidding (RTB) platform in C++ ▷ Migrating RTB components from Ruby to C++ ▷ Implementing new service interfaces to RTB hubs ▷ Implementing a scalable webserver using libuv (C++) ▷ Design and implementation of a Big-data system (Rust, Hypertable) ▷ Design and implementation of an efficient log-structured merge-tree database (Rust).

Languages          Rust, C++11, Ruby

Technologies      Hadoop, Hypertable, Bigdata, Protocol Buffers, msgpack, Apache Thrift, JSON, libuv, HTTP

Tools                git, Continuous Integration

Platforms          Linux

**Consultant, Developer****Remote, USA***Simplifi Holding**January 2010 – December 2011*

Performance optimization and development of reporting components ▷ Developing a scalable storage component for profile matching in a real-time bidding system (C++ with Ruby interface) ▷ Optimizing performance of profile matching in C++ and Ruby ▷ Developing reporting components in Ruby and C++.

Languages C++, Ruby  
Technologies Redis, In-memory Database, HTTP, CSV  
Tools git  
Platforms Linux

**Consultant, Developer****Remote, USA***Collective Media**February 2009 – May 2009*

Essential performance optimization of reporting backend (by factor 1000) ▷ Performance analysis and tuning of reporting backend (PostgreSQL) ▷ Design and implementation of a custom high-performance log-structured merge-tree database (LSM) for reporting in C and Ruby ▷ Connect reporting engine (backend) to frontend via webservice.

Languages C, Ruby, SQL  
Technologies Log-Structured Merge Tree Database, PostgreSQL, HTTP, CSV  
Tools git  
Platforms Linux

**Developer****Remote***hello2morrow GmbH**June 2008 – November 2008*

Implement Website hello2morrow ▷ Enhance existing CMS application ▷ Customize to new design (from Photoshop).

Languages Ruby, Javascript, HTML, CSS, SQL  
Technologies Ruby on Rails, PostgreSQL, jQuery  
Tools git  
Platforms Linux

**Developer****Remote***Personifi L.P.**January 2008 – May 2008*

Developing a scalable HTTP crawler ▷ Requirements analysis ▷ Architect and implement highly-concurrent HTTP crawler ▷ Administration.

Languages Erlang, C, Ruby  
Technologies HTTP, DNS, Cluster  
Tools git  
Platforms Linux

**Developer***Dr. Armin Roehrl***Remote***February 2008*

Implementing a special highly-concurrent HTTP proxy (10.000+ connections) to decouple slow backend processes (batch jobs).

Languages Erlang  
 Technologies HTTP, Proxy  
 Tools git  
 Platforms Linux

**Developer***Approximity GmbH***Remote***November 2007 – December 2007*

Implementation of stromverbraucherpool.de website ▷ Familiarize with existing code base ▷ Customizing.

Languages Ruby, SQL  
 Technologies Ruby on Rails, MySQL

**Consultant***metacreaTIC***Tiefenbronn***February 2007 – September 2007*

Project Consulting and Management ▷ Requirements analysis ▷ Client contact (USA) ▷ Project management.

**Architect, Shareholder***My Sites Oy***Remote***January 2007 – May 2007*

Developing and optimizing a scalable web platform ▷ Full-stack performance analysis and optimization of a web application (Backend, Frontend) ▷ Design of the cluster architecture and database ▷ Developing the Javascript frontend.

Languages Javascript, Ruby, SQL  
 Technologies Ruby on Rails, AJAX, Prototype, PostgreSQL, Sharding  
 Platforms Linux, Browser

**Developer, Sysadm***Personifi L.P.***Remote***March 2007*

Deployment and administration of a RSS newsfeed searchengine on Linux cluster

Languages Ruby, Python  
 Technologies Ferret ("Lucene")  
 Platforms Linux-Cluster

**Developer***My Sites Oy***Remote***October 2006 – November 2006*

Flash-based video streaming ▷ Analysing existing solutions for video streaming ▷ Installing and testing a streaming flash server.

Technologies Flash, Real Time Messaging Protocol (RTMP), lighttpd, HTTP

**Developer****Remote***Personifi L.P.**January 2006 – March 2006*

Developing a RSS crawler with web interface ▷ Developing a RSS newsfeed crawler and search engine ▷ Design and implementation of the distributed backend architecture. Interface to personality backend cluster ▷ Implementation of web frontend (Google ig/news clone).

Languages Ruby, Python, Javascript  
 Technologies Ruby on Rails, Ferret ("Lucene"), jQuery  
 Platforms Linux-Cluster, Browser

**Architect, Developer****Remote***Adfinem (Schernig, Hierl und Lang Management Consulting)**January 2006 – June 2006*

Full-stack development of a human-capital web platform for Human Resources in the Risk-Management sector ▷ Prototyping ▷ Requirements ▷ Developing the complex web platform ▷ Migration and Administration.

Languages Ruby, Javascript, SQL  
 Technologies Ruby on Rails, PostgreSQL, Mind-Maps, SMTP

**Developer****Remote, USA***Open Door Investment Advisor, Inc.**2005*

Develop WWW::Mechanize library for Ruby. Screenscraping.

Languages Ruby

**Technical Editor and Author****Remote***Syngress Publishing Inc**May 2001 – January 2002*

Book "Ruby Developers Guide" (ISBN 978-1928994640), 720 pages ▷ Managing the international co-authors ▷ Writing the outline of the book ▷ Technical editing of the complete book ▷ Authoring of 3 chapters.

Languages Ruby  
 Technologies MS Word

**Developer, Administrator and Partner****Karlsruhe***Page-Store Online GbR**2000 – 2003*

Developing the PageStore and WEBfree web sites.

Languages PHP, Perl, Ruby

**Software / Database developer****Karlsruhe***Merlin.Zwo InfoDesign GmbH**2000 – 2002*

Permanent position

Languages PL/SQL, Ruby, Java  
 Technologies Oracle 7,8,9i, Forms, XML  
 Platforms Suse Linux

## Education

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- **Karlsruhe Institut of Technology / University of Karlsruhe**, Diplom-Informatik (MSCS) (Ø 1.3). Topics: Embedded systems, computer architecture, system architecture, parallel data processing, biomedical measurement engineering

## Publications

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- *Improving a Hierarchical Evolutionary Algorithm with Applications in Optimization and Machine Learning*, Diploma thesis, Karlsruhe Institut of Technology, 2016.
- *Yinspire – A performance efficient simulator for spiking neural nets*, Research paper, University of Karlsruhe, 2008.
- *Schillernde Muster – Design Patterns in Ruby*, Linux Enterprise, Edition 09.2003.
- *Ruby Developer's Guide*. Book (ISBN 1928994644), Syngress Publishing, 2002.

## Reviews

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- Programming Ruby (2nd Edition), Pragmatic Programmers. 2004
- Programmieren mit Ruby, dpunkt.verlag. ISBN 978-3898641517. 2002

## Talks

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- *Rust – Efficient, Safe and Concurrent*, GPN13, Karlsruhe, Mai 2013.
- *HAMMER File System*, KIT Audimax, Karlsruhe, Januar 2010.
- *Efficient Ruby to Javascript Compilation*, RubyConf 2007, Charlotte / North Carolina, November 2007.
- *Wee Explained - Concepts and Internals*, 2. European Ruby Conference, Munich, Oktober 2005.
- *Ruby QuickStart*, GPN2, Karlsruhe, Mai 2003.

## Open source commitment

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- Porting and maintaining the Rust compiler and related libraries for DragonFlyBSD. Since 2013.
- DragonFlyBSD committer. Since 2008.
- Ruby committer. Since 1999. Retired.
- Original author of many Ruby libraries, e.g. Ruby/DBI, WWW::Mechanize, xmlrpc4r, postgres-pr, RubyJS, Wee.
- Many own open source projects: <https://github.com/mneumann/>, as well as participating in foreign projects.



## Miscellaneous Activities

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- Voluntary Childcare *Balu und Du*, Karlsruhe. 2011-2013.
- Childcare *Studieren für Kinder e.V.* Karlsruhe.
- Tutor for system architecture under Prof. Bellosa, KIT. 2009-2010
- Visiting a children's home in the south of Tajikistan for Deutsch-Tadschikische Gesellschaft e.V. 2011.
- Several longish journeys through Central Asia by motorbike and backpack. 2009-2014.
- Participating at the summer school of Fraunhofer-Institute under Prof. Dr. Albrecht Schmidt in Bonn. Developing a People-Searchengine. 2007.
- Internship at Arminco LTD (ISP) in Yerevan, Armenia. 2006.
- Co-organizing the 2nd and 3rd European Ruby Conference (EuRuKo) in Munich. 2004, 2005.
- Participating the Computer Society International Design Contest with the team of University of Karlsruhe. 2004.
- Organizing the 1st European Ruby Conference (EuRuKo) at the University of Karlsruhe. 2003.
- Research assistant, FZI Research Center for Information Technology, Karlsruhe. 2002.