

Stefan Wiegand

Software Engineer and Data Scientist

Long term experience in the areas of software development, statistics and machine learning allows me to cover all stages of your project from the first idea to the final performance optimized product. Starting with a fast proof of concept and first experiments using scripting languages like Python, Matlab or Scilab, followed by performance optimizations using external libraries written in C++ until the final application in C# or as a web service.

I work as a freelancer, with a lot of engagement and I like to be part of a team. Open communication is important for me. Because of working as a consultant I am used to learning the rules of new businesses and technologies quickly, to explain complex problems understandably and to develop feasible solutions with limited time and resources.

Experience:

- **Software Development**
 - Specification Creation
 - Agile Development/Continuous Delivery or V-Model
 - Software Architecture with Sparx Enterprise Architect
 - Function Owner in Automotive Projects (DAB and FM Radio)
 - Development according to MISRA & SPICE rules and the SOLID Principles
 - Performance Optimization for Scripting languages using C++ Libraries
 - Performance Optimization through Parallelization in C#
 - UI App Development in C++ and C#/.Net for Windows
 - Embedded App Development in C++ for Linux
 - Tool Development in Python Windows/Linux
 - Unit Tests with PyUnit, Nunit, Google Test and CppTest
 - Version Control using GIT
- **Machine Learning**
 - Development of necessary Data Pipelines in an existing Application to allow Machine Learning in the first place
 - Python Programming with Jupyter Notebooks, PyCharm, Numpy, Scipy, Pandas, Scikit-Learn, Matplotlib, TensorFlow, Keras, XGBoost
 - Dimensionality Estimation using k-means
 - Dimensionality reduction and feature selection (PCA, Auto Encoders, t-SNE, Lasso)
 - Clustering with k-Means, Fuzzy c-Means, Gath-Geva, Expectation Maximization, Hierarchical
 - Statistics and Visualization (Python, Matplotlib, Seaborn, t-SNE)
 - Heterogeneous parallel computing with the Map-Reduce model using Apache Spark/PySpark
 - Deep Learning (NN, CNN, RNN/LSTM, Auto Encoders) with TensorFlow and Keras
 - Defect Classification during end-of-line-testing for loudspeakers and electrical motors
 - Data acquisition using web scraping
- **Measurement Technology**
 - Klippel loudspeaker measurement systems for RnD und QC
 - Wavelet Analysis
- **Teamwork, Management of Employees and Student Mentoring**

Professional Focus:

Software Development,
Algorithms and Solution Strategies,
Machine Learning,
Statistics,
Optimization
Automatic Production Control and Quality Control,
Measurement Technology,
Automotive Software Engineering,
Embedded Systems
Microsoft .Net and Windows Applications

Skills

Programming Languages:	C#, C/C++, Python, PHP, JavaScript, Scilab, MATLAB, Windows Batch, Assembler, Visual Basic, VBA
Software Development Tools:	Sparx – Enterprise Architect, VisualStudio, Eclipse, PyCharm, Jupyter Notebooks, QNX-Momentics, jEdit, GIT, Smart SVN, SMART GIT, Team Foundation Server, Polarion, fogBugz, Jira, PyUnit, Nunit, Google Test and CppTest
Databases:	MySQL, kdb (Klippel Database)
Data Science Tools:	Google Colaboratory, Jupyter Notebooks, PyCharm Python, Numpy, Scipy, Pandas, Scikit-Learn, Matplotlib, Seaborn TensorFlow, Keras, Apache Spark, Pyspark, Map-Reduce-Principle Web-Scraping
Operating Systems:	Windows, Linux, QNX

Standards/Experiences:

DAB-Radio-Standard,
RDS-Standard,
UML State Machines,
Object Oriented Programming according to SOLID Principles,
Development according to Automotive-SPIICE and MISRA,
Class Libraries like

- STL
- .NET Framework
- MFC
- Klippel Automation + QC Framework

Refactoring, Merging, Version Control, Quality Control,
Statistical Methods, Fuzzy Logic, CMS

Web:

- Apache Webserver,
- CMSs, GetSimple
- Javascript, PHP
- HTML, CSS

In addition:

XML, UML, YAML

Industries:

International Loudspeaker, multimedia and automotive
manufacturers, producers of test equipment, customer electronics
and electro-mechanical drive systems as well as universities.

Academic Education

Education:

1999 - 2001

2003 - 2009

Master of Science - Computer System Engineering

A-Levels, focus on electrical engineering

Studies in Computer and Automation Engineering

Micro Masters – Data Science

05/2019 - 09/2019

University of California San Diego (Full time)

Certifications:

Project Management

Python for Data Science

Probability and Statistics in Data-Science

Machine Learning Fundamentals

Big Data Analytics Using Spark

Deep Learning with TensorFlow

Projects as freelancer

9/2019 - today

Tasks:

Data Scientist for Johnson Electric, Dresden

Development of a technique to automatically detect defective gear motors during End-of-Line-Testing.

Data analysis

- Statistics
- Clustering + Visualization
- Dimensionality Reduction

Consulting regarding appropriate Feature Extraction methods, e.g.

- Short Time Fourier Transform
- Wavelet Packet Transform
- Cepstrum Analysis
- Convolutional Auto Encoders

Comparison and optimization of detection rates and robustness of different Classifier Types.

Development of a Jupyter Notebook containing the entire Pipeline from training the AI to Classification

Creation of a deployment concept

Technologies:

Google Colaboratory, Jupyter Notebooks, Python, Numpy, Scipy, Pandas, Scikit-Learn, Matplotlib, Seaborn, TensorFlow, Keras, git

10/2017 - 3/2019

Task:

Software Developer for Premium Sound Solutions, Belgien

Development of various customisations of the standard measurement system of Klippel, e.g.: Porting to the new Version Klippel QC 6, added functions to improve the Quality Control of loudspeakers

Technologies:

Scilab, git, Klippel QC

8/2017

Task:

Consultant for Johnson Electric, Dresden

Training the Software Developers on how to improve Software Quality

Introduction of the Version Control Tool GIT

Technologies:

C, GIT, CUNIT, Check Unit Test Framework

1/2016 - 8/2017

Function Owner at Preh Car Connect, Dresden

Tasks:

Main Developer and Function Owner of the FM-Part in a Car Radio Project for Volkswagen, including check and correction of the Specification, Development of the Software Architecture, Design of several State Machines and Implementation of the business logic to control the communication between User Interface, Tuner, Signal Processing and Persistence. Implementation of Station-Tracking Strategies in FM. Field testing the Products during test drives in Europa.

Technologies:

FM, RDS, C++, qt Creator, GIT, Sparx Enterprise Architect, Linux, Jira

4/2015 - 6/2015

Software Developer for Klippel GmbH, Dresden

Task:

Performance Optimization for a Database Extraction Software by Parallelization using Task Parallel Library (TPL/.NET).

Technologies:

C#, .Net, Visual Studio, git, Klippel QC and Automation Interface

3/2014 - 3/2015

Software Developer for Premium Sound Solutions, Hongkong

Task:

Development of various customisations of the standard measurement system of Klippel, e.g. ensuring the correct mapping of DUT to the measured datasheet by automatically reading the serial number from the tested device

Technologies:

Scilab, Windows Batch, Windows 7, git, Klippel QC und Automation Interface

5/2013 - 7/2014

Software developer for Technisat, Dresden

Tasks:

Development of a DAB car radio for the Volkswagen group. Design of the central state machine and implementation of the business logic for the control of the communication between user interface, tuner, signal processing and persistence. Realization of Service Following Strategies in DAB as well as seamless FM-linking.

Development and Improvement of the DAB relevant Strategies in cooperation with Volkswagen. As well as testing the product during test drives through Europe.

Technologies:

DAB, C++, Eclipse, Momentics, Smart SVN, Sparx Enterprise Architect, QNX, Ubuntu Linux, Windows 7, Polarion

4/2013

Consultant for Johnson Electric, Dresden

Tasks:

Development of a software for the generation of audio filters.
Consulting regarding the improvement of the acoustical properties of an electrical drive unit

Technologies:

C#, Visual Studio, Team Foundation Server, Windows 7

4/2012 - today

Cooperation with the Klippel GmbH, Dresden

Tasks:

Development of a test software for the end-of-line-test and calibration of measurement devices
Writing a programming tutorial for the Klippel Automation API
Improvement of algorithms for curve manipulation
Training for customers via customization of the Klippel measurement system

Technologies:

C#, C++, Visual Studio, Team Foundation Server, Windows 7, git, fogBugz, Klippel QC and Automation Interface, XML

Projects as employee

1/2010 - 3/2012

Klippel GmbH, Dresden

Employed as a software developer, customer support and test engineer

Main task:

Development and expansion of a measuring system for industrial quality control of loudspeakers and automotive infotainment systems

Technologies:

C #, C + +. NET, Visual Studio, Scilab, Windows Batch, Windows 7, Windows XP, git, Klippel QC and Automation Interface, statistical methods

Task:

Flexible tool for post-processing and converting data from Klippel databases in other formats as XML or plain text

Technologies:

C #,. Net, Visual Studio, Scilab, Windows 7, Windows XP, git, Klippel QC and Automation Interface, NUnit, XML

Task:

Development of a tool for a faster creation of a final Software release, assembling the components and saving the sources and the final build, including version control

Technologies:

C #,. Net, Visual Studio, Windows 7, git, Windows batch, Klippel QC

Task: Development of various customisations of the standard measurement system of Klippel

Technologies: C #, C + +. NET, Visual Studio, Scilab, Windows Batch, Windows 7, git, Klippel QC and Automation Interface

Other tasks: Systematic testing of the software system before delivery

Customer service and advice

Project management of student projects on the subject:

1. Artificial Intelligence - Development of a system for automatic detection of speaker defects
2. Statistics for production monitoring

8/2007

Speaker manufacturer (part time)

Task: Tool for finding pairs of similar speakers from a pool of data sets

Technologies: C #, . Net, Visual Studio, Scilab, Windows XP, and Klippel QC Automation Interface

9/2006 - 12/2009

Klippel GmbH, Dresden (part time)

Tasks: Development of speed-optimized algorithms for graph manipulation, used in industrial quality control of speakers. Creating a tool to extract data from multiple data banks.

Technologies: C++, C #, . Net, Visual Studio, Scilab, Windows 7, Windows XP, FogBugz, SourceSafe, Klippel QC and Automation Interface, NUnit, XML

2/2007

Email provider / hosting (part time)

Task: Spam filter configuration

Technologies: Javascript, PHP, HTML, CSS

12/2005

Social network / website

Task: Gallery system for uploading and managing photos

Technologies: PHP, HTML, Javascript, CSS

2003 - 2005

Nonprofit Organizations

Task:

Web page creation

Technologies:

PHP, HTML, Javascript, CSS, CMS

2/2003

Dresden University of Technology

Task:

Tool for importing data from a sensor-equipped universal measuring microscope, including user interface and integration into Microsoft Excel

Technologies:

C + +, Visual Studio, VBA

While studying

Thesis

Development of a communication protocol to transfer Data via infrared and Implementation with Assembler in a micro controller

Diploma Thesis (FH)

Developing a system for statistical production monitoring in C #

Master Thesis

Development of a system for automatic detection of defects of speakers in industrial quality control using Scilab and the Klippel QC system

Personal Information

Name:

Stefan Wiegand

Address:

Schoberstr. 15
01279 Dresden

Phone:

+49-163-1493894

E-Mail:

wiegand@tailorware.de

Date of Birth:

1982

Nationality:

German

Family:

married, one child

Languages:

German (native)
English (fluent, long-term professional use)
Spanish (advanced)
French (basic knowledge)