Profile and Project Track

Name	Bernhard Wagner
Education	Software Engineer (Diploma ETH Zürich), CELTA-Certificate
Professional Experience	Teaching workshops in Electronics, Programming, Music: 8 years Performing artist: 35 years Software Development:36 years project management: 6 years Lead R & D: 2 years (4 associates)
Emphasis	• IT consulting, workshops and seminars • software architecture, design (patterns) and frameworks • software quality: "Test Driven Design", refactoring • software development • editing technological studies and concepts • technical project management
Languages	• German (native tongue) • Swiss German (very good oral) • English (very good oral and written) • French (very good oral and written) • Spanish (good oral and written)
OO-Processes	Test Driven Development (TDD)
Programming Languages	Python, JavaScript/Node, Java, C/C++, OO-Perl, Shell script (sh/bash), XSLT
Frameworks/ Class Libraries	Python: Django, Scrapy, Amazon Product Advertising API (bottlenose) C++: STL/Boost/Loki/TR1, Log4Cpp, CppUnit, Doxygen
Databases	RDBMS: SQL, INGRES, MySQL, Oracle
Internet/Protocols	HTML, Xdoc, CGI, JSP, XML, Sax/DOM, XML Schema, XML DTD, XSLT, XPath, JavaScript, Microsoft Internet Client SDK, HTTP (Client, Proxy und Server), MIDI
Operating Systems	Software development: Unix (HP-UX, Irix, AIX, SunOS, Linux), Mac OS X, Microsoft Windows
Development Tools	CASE: Together IDE: Eclipse, oXygen XML Editor, MS Visual Studio (Visual C++, Interdev, Basic, Visual Assist X) JFace, SWT, PDE, sdcc (small device c-compiler), Arduino, PhpStorm, PyCharm CM: GIT, Mercurial Build: Ant, Make, Jenkins
Other Products	Microsoft Office, Outlook, Project, Word, Access, Excel, Visio, Cycling '74 Max/MSP, CSound, Atmel AT89C4051 microcontroller, Raspberry Pi, Arduino

Project Track

2020-2021 **Adding new features / bug fixes to a legacy code base (GUI, Network, Realtime Graphical Representation)**
- GUI-Programming
- introduction of new tools (clang-format, ctags)
- replace vast code amounts by an algorithmic approach to switching layouts between left-to-right and right-to-left layout
- simplification of APIs by an algorithmic approach to determine parameters
- development of ancillary tools to search/refactor the code base (python)
- Programming in C, C++, MGR, Qt, Python, Perl, Bash

Since 2012 **Guidance of workshops for children, adolescents, and adults in electronics, programming, and music**
- ex-cathedra teaching
- Soldering
- Programming in C
- Group workshops

Since 9/2002 **Lectureship Software Engineering and object-oriented programming for Fernfachhochschule Schweiz (FFHS), Hochschule für Technik Zürich (HSZ-T), Zürcher Hochschule für Angewandte Wissenschaften (ZHAW)**
- ex-cathedra teaching, e-learning
- Workshops
- Short tests
- Exam

Visual C++, Java, eclipse, MOODLE, Luvit

03/2019 **A week-long workshop in electronic music for myopathic children and youths**

Conducted a week-long workshop "electronic music using a computer" for myopathic children and youths. Introduced the participants to ableton Live, taught how to remote control self-built instruments with an external MIDI controller, how to use the same technology to control DMX lighting.

06-07/2018 **A month-long workshop in building percussion instruments from recycled materials for children and youths in Colombia**

Conducted a month-long workshop building percussion instruments from recycled materials. Taught them how to play the instruments in an ensemble.

09/2012 - 03/2014 **Design & Implementation of an adhesive force calculation application, refactoring of legacy php code**

Adhesive force calculation app for a magnet webshop: Lua Programming Language, PHP, PhpStorm, Beanstalkd Queue, Samba, Windows batch programming

06/2010 - 02/2012 **Design & Implementation of a Plugin for oXygen XML Editor**

Requirements Analysis, Design, Implementation, automated tests, automated deployment.
Java, Swing, Eclipse, oXygen-XML-Editor, JUnit, Saxon, XSLT, interval-tree

04/2011 **Conducted a masterclass at music department of HSLU**

Conducted a 1-day masterclass about Thelevi percussion instrument.
Wah-wah shaker, thelevi, one-shot-shaker, polyrhythms.

06/2010 - 02/2012 **Contributions to projects supporting blind, visually impaired and print disabled**

Java-Bindings to a C-Library (liblouis), Saxon-Extension. XSLT-Test-evaluation and implementation for open-source-project "DAISY Pipeline 2". Implementation of backend of an ePub-check-web application using the Play! framework. Webservice as Python Django application, which retrieves meta-information about articels from the Amazon Product Advertising API (bottlenose). Port of open source projecten to recent Java versions: Java

DICT API, Text-Checking API for JAVA, interval-tree. Improvements to an XSLT-Test-Framework "Xspec". Automation of build process using Jenkins Java, Eclipse, JUnit, liblouis, Saxon, XSLT, UTF-X, Play!, Python Django, Amazon Product Advertising API (bottlenose), Java DICT API, Text-Checking API for JAVA, interval-tree, Jenkins

05/2008 - 05/2009   **Design and implementation of an automatic business rule converter**

Analysis, design and implementation of an automatic business rule converter for a proprietary investment compliance rule language in a commercially successful asset management product. The source language is stored in a relational database and the result is an xml application. Tasks: Parsing of proprietary language into an abstract syntax tree, modification of the syntax tree, subsequent generation of target xml constructs.
Java, Eclipse, JUnit, SQL, Toad

05/2006 - 05/2007   **Introduction of Smart Pointers in a large scale asset-management project**

Analysis, Evaluation and test-driven implementation of several smart pointer technologies (Boost, TR1, Loki) in a commercially successful asset management product. Complex environment (massive multithreading, proprietary code generator, client: Java, server: C++)

Development of a cross-compiler plugin for Microsoft Visual C++ 2005 Enterprise Edition.
Gcc 3.2.2, 4.1.1, Boost, Loki, TR1, Microsoft Visual C++ 2005 Enterprise Edition, Visual Assist X (Whole Tomato Software), CppUnit, Java, Eclipse, JUnit

09/2005 - 02/2006   **Development of eclipse plugin for domain specific language**

Development of eclipse plugin for domain-specific language with AST for syntax highlighting, hover help, etc.
Eclipse 3.1.2 PDT, JDT, Java 1.4, ant.

08/2005   **Organization and implementation of courses in audio editing and programming**
Two courses running in parallel: Multitrack audio recording and editing, and programming. For children Ages 8-13 (Employer: http://feriencamps.ch).
Magix Music Maker, Visual Basic, didactics.

05/2005 - 09/2005   **Organization and production of 3-day international music festival**

3-day international music festival with 40 artists from USA, UK, Germany, Sweden, Italy, Croatia, Austria, Czech Republic, and Switzerland (see http://loopfestival.com).
Press work, team motivation and coordination.

04/2005 - 05/2005   **Development of a microcontroller programming tool for an art project**

Excel-Sheet as "composition tool", allows time-driven toggling of 12 I/O-ports on an Atmel AT89C4051 for controlling four digital dictaphones.
Microsoft Excel Macro, Perl, sdcc.

03/2005   **Coaching/Implementation in a Perl-Project Oracle-DB-connection**

Redesign and implementation of the software-architecture of a Perl-Oracle-DB-connection.
Perl, Oracle.

03/2004 - 04/2004   **Software Architecture Redesign/Consulting Telecom Billing**

Redesign of the software architecture of a JobManager (application launcher). Formulation of a common interface for existing applications for control, scheduling and supervision.
JUnit, eclipse, jdk1.4, ant, Apache Quartz, Unix Processes.

02/2004   **Software Architecture, Consulting Audio/Realtime**

Refactoring of two implementations (Steinberg VST, Soundart Chameleon) with the same functionality (Loop) into a common architecture. Portability between Mac OSX and Windows. Installation of a CVS-repository with ssh tunneling. Installation of a Wiki for the communication within the geographically distributed team.
Steinberg VST, Visual C++ 6.0, CodeWarrior 8.3, CVS, ssh tunneling.

10/2003 GUI Application development using JFace/SWT

- 1/2004 Analysis/Specification of the functionality of a data processing tool as a preliminary stage to import to SAP. Development of the GUI application using Eclipse JFace/SWT.
JUnit, eclipse JFace/SWT, jdk, ant, XML, SAX, Apache Xalan.

1/2003 Refactorings in the Open-Source Project "XPath Explorer XPE"

open ended XPE is a GUI Tool for debugging XPath expressions on XML and HTML documents. Since the translation from HTML to XML a level of flexibility was introduced that allows switching the HTML Parser used by XPE at runtime.
JUnit, eclipse, javadoc, XPE, jdk1.4, HttpUnit.

1/2003 Refactorings in the Open-Source Project "Muffin"

open ended Muffin is an open source proxy for filtering content of web pages. My contribution consists of simplifying the development of new filters by a stepwise migration of the software into a framework. This is done via structured refactoring. Introduced an abstraction layer to leave a free choice between independent Regexp Engines. The software remains functional during the whole migration.
- JUnit-Tests for the existing functionality
- Migration of the existing code into new architecture
- JUnit-Tests succeed
Junit, eclipse, javadoc, Muffin, jdk1.4 Regexp, Jakarta Regexp, Gnu Regexp

12/2002 Development of a live electronic system

- 1/2003 The live electronic system collects the notes of three musicians and reproduces the notes according to a specific selection system triggered by acoustic stimulation. The system was used January 18. and 19. It has been reported by Tages-Anzeiger on January, 21., p. 50: "Performance im Boxring" by Dominik Dusek.
- Programming Max
- Configuration of MIDI network
- calibration
- test
Cycling '74 Max/MSP, MIDI

9/2002 Contributions to Open Source Projects HttpUnit, Jelly, WebTest

- 1/2003
- Refactoring
- Tests
- Documentation
Eclipse

9/2002 website and application architecture

- 12/2002 relaunch of the public website of a renowned finance company introducing Wyona CMS (now: Apache Lenya), Cocoon and integration of a database - backend.
- Analysis & Design
- Reengineering
- Implementation
- Build-System
- Performance-Tests
- Regression-Tests
- Documentation
- Internal Presentations for the technologies Apache Lenya, Cocoon

Java, Cocoon, xdoc, XmlSpy, Oracle-SQL, Perl, Ant, JMeter, Tomcat, Apache

Lenya, Canoo Webtest

6/2002 **Java Programming course for Sun Educational Services**
- ex-cathedra teaching
- exercises

2/2002 **Application Development Telecom Billing**
- 5/2002 Application for financial calculations. method: Rational Unified Process.
- Analysis & Design
- Object-oriented reengineering
- Implementation
- Generating test data / tools for import/export
- tests
- documentation
- Internal Presentations for the technologies testing, documentation, scripting and their non-intrusive integration into the client's existing environment
- written concept for unified Exception-Handling C++

C++, STL, CppUnit, Doxygen, Oracle-SQL, OO-Perl, Microsoft Visio, Microsoft Word, Microsoft Excel

11/2001 **Ad Interim: Software-Company Network 24/7 AG**
- 5/2002
- Business plan
- CTO
- COO
- Buildup / Maintenance customer base (CRM)
- Buildup technical infrastructure (firewall, Server Microsoft Windows 2000, CVS-Server, Backup-concept)
- conception & implementation of a course "Design Patterns & Refactoring"
- Consulting in the pilot phase of several internet projects
- Course instruction Java (Sun Educational Services)
- Course instruction Calculus (Fernfachhochschule Schweiz)

5/2001 **Sabbatical: Scientific Work**
- 10/2001 research, documentation, implementation of prototypes for PhD work in progress.
sub-projects:
- scientific research
- documentation (Microsoft Word, LaTEX, Visio)
- implementation of prototypes (C++, MET++, SNiFF+)
- Object-oriented Reengineering

C++, MET++, SNiFF+, LaTEX

1/2001 **XML/XSLT/HTML-Wizard**
- 4/2001 Project management (2 associates software, 2 associates design), analysis, architecture, design and implementation of a wizard for generating HTML and PDF from the same XML sources. Client: financial company.
Technical sub-projects:
- design/architecture of a Java framework
- definition of the information architecture (XML/Schema)
- definition of the process for data acquisition and representation as XML
- set up and document a system that can be operated autonomously by the client

Java, XML, XML/Schema, XSL, XSLT

5/2000 **Java-Web-Navigator**
– 12/2000 Head of Development (3 associates), analysis, architecture, design and implementation of a navigators based on a successful C++-implementation.

Auszeichnung:**TOP3- Award Industrie-Forum Deutschland 2001.**
Technical sub-projects:
- design/architecture of a Java framework
- definition of a generic and extensible data architecture (XML/Schema)

- Object-oriented reengineering of a Junior's prototype
- integration into the client's software architecture
- set up and document a system that can be operated autonomously by the client

Java, XML, XML/Schema, HTTP

5/2000 **C++-Web-Navigator**

– 12/2000 Analysis, architecture, design and implementation of a navigators based on the ET++-framework.

Technical sub-projects:
- design/architecture of a C++-framework
- definition of a generic and extensible data architecture (XML/Schema)
- integration into the client's software architecture
- set up and document a system that can be operated autonomously by the client
- CVS-Repository-Integration with SNiFF+

ET++, C++, XML, XML/Schema, HTTP, cvs, SNiFF+

5/2000 **e-Catalog**

– 12/2000 Head of development (5 associates), analysis, architecture, design and implementation of an interactive e-Catalogs as front-end to a B2B-platform based on JSP/Servlets.

Technical sub-projects:
- design/architecture of a Java-framework
- integration into the client's software architecture
- set up and document a system that can be operated autonomously by the client

JavaBeans, Design Patterns, JWarp

11/1999 **Web-application**

– 3/2000 Head of development (2 associates), analysis, architecture, design and implementation of a configurable CGI-Perl-application for easy configuration of a Set-Top-Box.

Technical sub-projects:
- design/architecture of a Perl-Framework
- Definition of the information architecture
- integration into the client's software architecture

Perl

1/2000 **Chart Server**

– 6/2000 Head of development (2 associates), analysis, architecture, design and implementation of a Chart-Server for visualization of finance information (time series) in a variety of formats

Technical sub-projects:
- design/architecture of a Java-Frameworks
- evaluation and integration of a graphics-library (PGPlot)
- integration into the client's software architecture

JavaBeans, Design Patterns

10/1998 **Formation of the Company Perspectix-NOSE AG**

10/1998 **Time Series Visualization**

– 10/1998 Head of development (2 associates), analysis, architecture, design and implementation of a highly configurable (XML) Chart-Server for visualization of time series in a variety of formats (ubilab: research lab of UBS Zürich)

Technical sub-projects:
- design/architecture of a C++-Framework
- evaluation und integration of a graphics-library (PGPlot)

SUN Solaris, Design Patterns, Perl, PGPlot, XML, SNiFF+

| 10/1997 | **Time Series: Scripting Connection** |
| – 10/1998 | Head of development (2 associates), analysis, architecture, design and implementation of a scripting connection to a database optimized for time series (ubilab: research lab of UBS Zürich) |

Technical sub-projects:
- reproduction of the C++ class hierarchy
- implementation of a comfortable API

SUN Solaris, Design Patterns, OO-Perl

| 1996 | **Art Project: Clarence Barlow: Automated Music Composition to Film** |

Development, analysis, architecture, design and implementation of parameter extraction from animated film (Oskar Fischinger "Study No.6", 1930.)

Technical sub-projects:
- development of a User-Interface based on the multimedia-application-framework MET++.
- Shape recognition in film (API, dynamic configuration)
- Generation of geometric information

SGI IRIX, Design Patterns, MET++, IDE SNiFF+

| 10/1996 | **Art Project: Realtime-Visualization of Music** |
| – 03/1997 | Head of development (2 associates), analysis, architecture, design and implementation of a visualization of Music |

Technical sub-projects:
- development of a User-Interface based on the multimedia-application-framework MET++.

Technical sub-projects:
- MIDI   - Converter MIDI->control information
- 3D-geometry   - development of a configurable 3D-object

SGI IRIX, Design Patterns, MET++, IDE SNiFF+

| 1996 | **Formation of the Company Perspectix AG** |

| 5/1996 | **Web browser with its own visual programming environment** |
| – 12/1996 | Development team (3 associates), analysis, architecture, design and implementation of a web browser |

Award: **BYTE Magazine Award Cebit 1996.**

Technical sub-projects:
- Development of the user interface based on the multimedia-application-framework MET++.
- Own visual programming for creating interactive, multimedia (3D, Audio, Animation) Web-content.

SGI IRIX, Design Patterns, MET++, IDE SNiFF+

| 10/1995 | **Visual Data Browser (Data Mining)** |
| – 03/1996 | Head of development (4 associates), analysis, architecture, design and implementation of a data browser for finding hypothesis in large error-logfiles of a renown Swiss financial institute |

business sub-projects:
- cost calculation, –controlling and project management

technical sub-projects:
- EBCDIC Converter EBCDIC->ASCII
- Unidata NetCDF Converter ASCII-> Unidata NetCDF
- Reverse Engineering of the proprietary data format
- Development of the user interface based on the multimedia-application-frameworks MET++.

SGI IRIX, Design Patterns, MET++, , IDE SNiFF+

| 10/1994 | **PC remote maintenance** |
| – 05/1995 | System for the network-batch-configuration of a PC-fleet based on a set of |

images and individual parameter (IP address, hostname, username, etc.)

10/1993 **Application Development Labour Mobility Policy**

– 10/1994 Analysis, Design, and Implementation of an end user application in the context of the Swiss Pool for Labour Mobility Policy. Design, Implementation and Normalizing of an ER-model. INGRES-Database administration.

Tools: INGRES, SQL, C, Windows4GL.

6/1985 **questionnaire analysis**

– 12/1985 TurboPascal-application for acquisition and statistical analysis of market-research-questionnaires.