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updated 17.12.2017

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| Development Driving Assistants |
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| since 2016(ongoing projects)BMW M GmbH, Munich | * project architecture
* communication and component architecture
* hardware/software gateways (Gateway, CAN, Flexray, Most etc.)
* platform independent communication framework (“GWNG connector”)
* offline test environment
* development and administration of the official development environment
* management and administration of management tools

 Languages: C++11, C++14, C#, Java, bash, PowerShellTools: Visual Studio, Eclipse, Git/Gerrit, Atlassian Crowd, Confluence, Jira, VMWare Player/Workstation, Microsoft Office, Remote Desktop, VPN, Raspberry Pi, Matlab, AUTOSAR, UnityPlatforms: Ubuntu Linux 16.04 LTS, Windows 7/10, Windows Server, Raspberry Pi, ROS, Android, iOS |

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| Highly automated driving, development from scratch to pre-production |
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| 2012 – 2017BMW Forschung, Munich | Based on the ROS communications framework a higly automated (self-) driving vehicle is being developed from scratch to pre-production. * project architecture
* communication and component architecture
* hardware/software gateways (ZGW-Gateway, CAN, Flexray, Most etc.)
* controller and information components (environment model, vehicle model, etc.)
* responsibility data flow
* offline test environment
* development and administration of the official development environment
* management and administration of management tools

 Languages: C++11, C#, bashTools: Eclipse, Git/Gerrit, Atlassian Crowd, Confluence, Jira, VMWare Player/Workstation, Windows 7, Microsoft Office, Remote Desktop, VPNPlatforms: Ubuntu Linux 12.04 LTS, Ubuntu Linux 14.04, Windows 7, Raspberry Pi, ROS Groovy, ROS Hydro, ROS Indigo |

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| Network administration and support / Honorary (unpaid) job |
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| 2002 - 2014Haus International,Landshut | * Set up and maintenance of the internal network for a personnel of 15 people
* Set up and maintenance of all participating hardware (computers, servers) and software, including 25 schooling computers
* Phone support for all occurring hard- and software issues

Languages: C#, .NET, Batch, VBScriptTools: Windows 2003 SBS, Exchange 2003, Microsoft Office, Microsoft Outlook, Remote Desktop, VNC, VMWare ServerOperating systems: Windows XP, Windows 7 |

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| Implementation of new concepts for a maintenance management system |
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| 2011 - 2012BMW UX, Munich | The existing maintenance management system AW-RS has been expanded with * a new reusable container object „Tätigkeit“ (activity),
* and (in some sections) a completely new user interface marking the transition between terminal based (keyboard focused) concepts to more informative and self-explanatory user interface concepts.

Due to very rudimentary existing documentation a lot of very detailed analysis of existing sorce code and data has been necessary.Language: C#, PL-SQLTools: Microsoft Office, Microsoft Visual Studio 2008, Araxis Merge, Subversion, Oracle 11, Toad, Tora, Quest SQL-OptimizerOperating Systems: Windows XP |

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| Calibration software for airplane power engine (jet) adapters |
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| 2008 - 2012MTU, Munich | * Managing and calibrating software,
* software and hardware test tools,
* and adapter firmware

have to be designed, developed and/or customized.Development follows the DO 178 B / DO 254 standard.Language: C, C#, .NET, C++ CLI, Spring.NET, PythonTools: Microsoft Office, Dimensions, Requisite Pro, mantis, Softools, Microsoft Visual Studio 2008, Visual Studio 2010, Araxis Merge, SubversionOperating Systems: Windows XP |

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| Software library for automatic power engine adapter tests |
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| 2011MTU, Munich | * Analysis of existing test scripts in an automatic test environment for hardware and software tests
* Extraction of base functionality as a reusable well-documented library
* Implementation of tests as test scripts using the library

Development follows the DO 178 B / DO 254 standard.Language: PythonTools: Microsoft Office, Dimensions, Perl, Araxis Merge, SubversionOperating Systems: Windows XP |

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| Core Software for Maintenance Simulation of the Tiger Helicopter |
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| 2005 - 2008EADS, Ottobrunn | The goal is an event-based simulation software core. Objectives are design and implementation of all different parts of the software, as well as tools for test and implementation.In addition, a webserver for communication and support will be set up, and a bug tracking system maintained.Language: C++, C#, .NETTools: Microsoft Visual Studio 2003, Visual Studio 2005, Borland Together, Microsoft Office, Bugzilla, VSS, Subversion, ApacheOperating Systems: Microsoft Windows 2000, Windows XP, Windows 2000/2003 Server |

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| Maintenance of the radiography digitizers CR25.0 and CR75.0 and development of CR35.0 and CR85.0 |
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| 2005 - 2007AGFA-Gevaert AG, Munich | * Design and implementation of new features
* Fault repair and bugfixing
* Documentations
* Support (including phone support)

Language: C (DIAB-Compiler), Perl, Shell-Scripts, CLIPS (Expert system)Tools: Microsoft OfficeOperating Systems: Portex (VRTX), Sun OS, Microsoft Windows 2000 |

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| Design, implementation and documentation of firmware including user and web interface for a new generation of radiography digitizers (CR25.0); extension and redesign of the expert system for diagnosis |
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| 2003 - 2005AGFA-Gevaert AG, Munich | Goal is the combination and consolidation of two machine generations and at the same time the change to a new processoe type (PowerPC, Ariel- and Oberon-Board). The main part is design and implementation of new features.The self diagnostic system of the machine will be completely revised.Language: C (DIAB-Compiler), Perl, Shell-Scripts, CLIPS (expert system)Operating Systems: Portex (VRTX), Sun OS, Microsoft Windows 2000 |

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| Installation Analysis |
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| 2004AGFA-Gevaert AG, Munich | Aim of the analysis was an evaluation of changes on the target system of a software installation, especially changes i nthe environment of already installed software.All changes in the registry, the file systems and in single files, and, if necessary, changes in hard disk boot records have been recorded and analyzed.An evaluation was done in several steps because of the amount of requirements needed for the software to be installed (new Internet Explorer, .NET-Framework, Visual J++, WMI...).Tools: Araxis Merge, lots of concentrationOperating Systems: Windows NT Server 4.0 |

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| Extension and refining of ActiveX (OCX) Controls for a touchscreen user interface |
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| 2003Siemens AG, Munich | * Context help
* central framework control center for colors, sizes, labels, fonts)
* all controls can be used with Visual Basic, Visual C++ (all environments that support ActiveX)

In addition all standard Windows 2000 controls have been wrapped to support Unicode controls with Visual Basic. These controls are used in the non-touchscreen version of the software product.Language: C++Tools: MFC, ATLOperating Systems: Microsoft Windows NT, 2000 |

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| Development, documentation and analysis for Eurofighter Ground Loading Station |
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| 2001 – 2003EADS, Ottobrunn | * Interface Hard/Software
* Subsystem responsibility
* Software tool for query management

Language: C++, MFCTools: Doors, Office, Visual C++, Visual Studio .NETOperating Systems: Microsoft Windows NT/2000 |

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| Installation routine for robot control software |
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| 2002EADS, Ottobrunn | * User account creation and management
* User rights
* Software installation

Language: Shellscripts, RPMTools: RPMOperating Systems: Linux |

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| Set-up of PC training room |
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| 2002Bavarian State Library, Munich | * Hard- and Software setup
* Network setup (Domain-, Internet-, Mail-, User management)
* Management Software
* Administration Tools
* Automatic recovery and re-establishment of technical environments

This system allows unattended recovery and re-establishment of 40 PCs to defined original state (complete with installed software, for instance a customized Microsoft Office package) with single press of a button in 15 Minutes. In addition, user data can be reset to original state.The PCs have been included (with reduced access) into the library network.Language: Visual C++, SkripteTools: ISA-Server, Exchange, Drive-Image, self written tools, etc.Operating Systems: Windows Server 2000, Windows 2000 Professional |

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| Administration, maintenance and service of the Prestel publishing house’s PC network |
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| 1999 - 2002Prestel Verlag, Munich | * 30 PCs with Windows NT 4.0, 20 MACs
* Administration of Linux Webserver, Linux Oracle DB Server and a Windows NT 4.0 File- and Exchange-Server
* Backup Maintenance
* Website administration

Languages: C++, BatchTools: Windows NT Server, Exchange, Microsoft Office, Microsoft Outlook, VNC, PC AnywhereOperating Systems: Windows NT Server, Windows NT, Windows 2000, Mac OS |

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| Extension of the fill level controller for traceability |
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| 2000 – 2001Siemens AG, Munich | In addition to the above mentioned duties data of a belt end recognition system and a mobile scanner unit are managed. Additional viewing and controlling methods have been developed and implemented.Language: C++, XMLTools: MFC, ATLOperating Systems: Microsoft Windows NT/2000 |

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| Design and Implementation of about 20 ActiveX (OCX) Controls for a touchscreen user interface |
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| 2000 – 2001Siemens AG, Munich | * Implementation from scratch without subclassing windows controls
* All control outfit (colors, sizes, labels, fonts) can be changed through a central framework control center
* all controls can be used with Visual Basic, Visual C++ (all environments that support ActiveX)

In addition all standard Windows 2000 controls have been wrapped to support Unicode controls with Visual Basic. These controls are used in the non-touchscreen version of the software product.Language: C++Tools: MFC, ATLOperating Systems: Microsoft Windows NT, 2000 |

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| Design and implementation of a website (including eCommerce), author accounting software, title database, invoice software |
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| 1999 – 2001Prestel Verlag, Munich | * Website design and implementation using Java servlets on Linux with Apache SSL server
* online ordering system (Webshop)
* the software was designed and programmed with Java to run under NT and Macintosh)

Languages: HTML, C++, Java, JavaScript, Shell SkriptDatabases: Oracle 8i, YardOperating Systems: Microsoft Windows NT, Linux/UNIX |

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| Software Trace System |
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| 1999 – 2001Bachmayer GmbH, Landshut(for different customers: Siemens, HP...) | Multihost controlling and tracing respectively logging of process informationLanguage: C, C++Tools: MFC, ATLOperating Systems: Microsoft Windows 95/98/NT/2000, UNIX/Linux |

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| Fill level controller for Siemens eletronic assembly machines |
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| 1999 – 2000Siemens AG, Munich | Fill level calculation through statistics over the machine's production data. Warning or power off mechanisms derived through rules according to that data.The software has been implemented using client/server technique, the server being a service and the client an ActiveX control.Language: C++Tools: MFC, ATLOperating Systems: Microsoft Windows NT/2000 |

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| Design and Implementation of a faxing tool |
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| 1999 - 2000, 2001Bachmayer GmbH, Landshut | * A fax receiver receiving with CAPI 2.0, forwarding to email boxes or printing directly.
* An OCX fax viewer to comfortably view, zoom, rotate, print and manage received faxes for example inside Outlook, or on a web page.

Languages: C++, Java, Javascript, HTMLTools: MFC, ATLConnection to Mailserver via RFC 821+822 SMTP protocolOther APIs: CAPI 2.0, Outlook/ExchangeOperating Systems: Microsoft Windows 95/98/NT/2000 |

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| Remote Administration Service |
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| 1999Outsourcing Division of the Hewlett Packard GmbH | Conception and implementation of service that allows remote* controlling of other services
* access to system resources
* implementation of a time scheduler
* send message to other services in case of blackouts or breakdown

This service has been used to automatically restart other services that are likely to stop working, and, if that was not possible, it tried to reboot the machine following certain rules.Languages: C, C++Operating Systems: Microsoft Windows NT, HP-UX 10.20 |

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| Backup-Tools |
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| 1998 – 1999Outsourcing Division of the Hewlett Packard GmbH | * Conception and implementation of scripts to manage backups and backup media (changing robots and libraries etc.)
* Control of different backup software systems through parameters (e.g. HP OmniBack, Seagate Backup Exec)

Languages: Perl, C, C++Backup-Software: HP OmniBack, Seagate Backup ExecOperating Systems: Microsoft Windows NT, HP-UX 10.20 |

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| SITEST HS 50 (Setup and maintenance user interface for Siemens electronic assembly machines) |
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| 1997 – 1998Siemens AG, Munich | * Conception and design of the new user interface and functionality
* Software port from older machine generations and implementations
* Implementation of new features

Language: C++Tools: MFC, ATLOperating Systems: Microsoft Windows NT, RMOS 3 |

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| SITEST 403/404 (Setup and maintenance user interface for Siemens electronic assembly machines) |
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| 1997 - 1998Siemens AG, Munich | * Software port from older machine generations
* Implementation of new features that extend user interface functionality

Language: C++Tools: MFC, ATLOperating Systems: Microsoft Windows NT |

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| Operating data registration and control |
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| 1997Kratzer Automatisierung GmbH, Unterschleißheim, Munich | Registration and control of inventory and production data during productionLanguages: Java, Visual BasicDatabase: Microsoft AccessOperating Systems: Microsoft Windows NT |

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| Database System for Customer Management and Support |
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| 1996-1997GWMC Wirtschaftsforschung, Passau | Languages: C++, Visual BasicDatabase: Microsoft AccessTools: MFCOperating Systems: Microsoft Windows 3.11, Windows 95, NT 4.0 |