Stephan Brumme — Portfolio

Fraunhoferring 6
85609 Aschheim
Germany

+49 (174) 496 66 89
job@stephan-brumme.com
www.stephan-brumme.com

These are the most influential milestones of my education and professional career.
The portfolio is intended as a supplement to my Curriculum Vitae which is available online, too.
If you need more in-depth information, don't hesitate to contact me. Thank you !

Professional

Tradegate AG, Berlin 2012 - now
Software Engineer, stock exchange backend code (www.tradegate.de)

Project for BMW AG, Munich 2011
Software Engineer, BMW's car head-unit (www.bmw.com)
- C++ programming of the human-machine interface of upcoming BMW generations
- close to 2 million lines of code (mainly C++)
- cross-platform (development on Windows workstation, deployment on embedded system / QNX)
- STL, Boost, in-house framework
- device communication via MOST message bus
- development tools: Visual Studio, Subversion, Jira

Brainlab AG, Feldkirchen/Munich 2006 - 2010
Software Engineer, Medical software (www.brainlab.com)
- ExacTrac® patient positioning software
- system consists of approx. one million lines C++
- Windows only, using MFC, STL, Xerces, ActiveX and in-house framework
- software links to in-house and external hardware (linear accelerators) with TCP/IP and RS232/422
- soft realtime requirements for certain tasks
- Nvidia Cg shader based X-ray/CT scan image fusion implemented with OpenGL
- development tools: Visual Studio, Bugzilla, Lint, Perforce, SourceSafe
- documentation: many in-house tools, UML/Visio, Doxygen
- spent about three weeks a year on customer/test sites, mostly California and Switzerland
- patent pending on "Tracking Representations of Indicator Body Parts", (published as WO/2011/107145)

Derdack GmbH, Potsdam (internship) summer 2000
Software Engineer, MessageMaster software suite (www.derdack.com)
- SMTP-to-SMS forwarding server (sends email as SMS)
- wrote converter transforming MIDI songs into Siemens and Sagem mobile phone ringtones
- Windows, MFC, STL
- development tools: Visual C++, SourceSafe

(continued on next page)

University

Student Assistant (Hasso Plattner Institute, University of Potsdam) 2005

Tutor for Computer Graphics I and II (courses taught at Bachelor level)
- creating and evaluating bi-weekly assignments (team of 3 tutors, I'm the only one without PhD)
- bi-weekly 45 minutes presentation in front of 120 students
- roughly 30% theory and 70% programming exercises in C++ and OpenGL
- voted best tutor in 2005 at the institute (election by students)

Exchange Postgraduate Student (University of Technology Sydney) 2004

(*selection of the most relevant courses*)
- Advanced Image Synthesis Techniques
  - implemented a completely shader-based ray-tracer in C++
  - best student in class
- Game Programming
  - consisted of several smaller projects (all C++/OpenGL), for example:
  - large scale data/texture handling: loading PK3 levels from id software games, e.g. Quake III
  - Artificial Intelligence: fast 2D/3D path finding
  - implemented sound, collision detection
  - best student in class
- Building Intelligent Agents
  - wrote Java client that scans Gnutella Peer-to-Peer file sharing networks
  - deducts responsible persons (incl. Address and phone number) from their IP addresses
  - selected as one of the five best projects

Bachelor Thesis (Hasso Plattner Institute, University of Potsdam) 2003

Interactive Visualization of Mobile Phone Network in 3D City Models
- joint project with T-Mobile Germany
- team of three students
- Visual C++ with VRS scenegraph, Windows only
- uses OpenGL, Qt3, STL
- source control: CVS
- documentation: UML/Visio, FMC, Doxygen, Word

Student Assistant (Hasso Plattner Institute, University of Potsdam) 2001 - 2002
- (Computer Graphics) implementing features for VRS scenegraph
  - input file parser
  - generate Pixar Renderman compatible scene file output
- (Software Engineering) implementing a database for in-house administrative use
  - Java, SQL

Cited Papers
- "The OpenGL Shading Language", cited by NVIDIA Corp. patent #8,044,951 ("Integer-based functionality in a graphics shading language") 2005
- "Bildbasiertes Constructive Solid Geometry" on Goldfeather algorithm used by Mr. Jack Goldfeather himself in his course CS311 at Carleton College 2002

High School

Friedrichgymnasium Luckenwalde 1991 - 1998

Abitur (equivalent to International Baccalaureate)
- final mark/grade: 1.1 (scale 1 – 6, lower means better), top 5% student
- specialized in Maths, English, Computer Science and Politics
- class representative for several years

(continued on next page)

Hobby Projects

Bundeswettbewerb Informatik (National Computer Science Contest in Germany) 1996 - 1999
Best rank: 43 in 1997/98 (out of about 1000 participants)

Publication
"Als die Bilder laufen lernten"
- German computer magazine "PC Intern", issue December 1995
- 4 page article about my own x86 assembler-optimized FLI-movie playing library (predecessor of AVI)

Internet
www.stephan-brumme.com / brum.me since 1999
- the following is true for all my internet projects:
  - running on an Apache web server (Debian Linux)
  - backend consists of PHP, XML and MySQL / SQLite, front-end: HTML, CSS, Javascript
  - more than 95% of the code was designed and written by me
  - about 1000 visitors per day, on average 200 MByte traffic per day
  - over 40 million hits (~2 million visitors) since 1999

most relevant projects

create.stephan-brumme.com since 2011
- a blog covering programming related topics
- usually about C++, PHP, Javascript and OpenCL
- often includes code samples, live demos or downloadable executables

photos.stephan-brumme.com since 2011
- pictures and videos I took while travelling the world
- intended to be a personal show-case for HTML5, CSS and Javascript
- automatic creation of image database (PHP, SQLite) by extraction meta-data from pictures / videos
- visual effects rely on jQuery/FancyBox library

bits.stephan-brumme.com since 2008
- analysis of high-performance code snippets on x86 CPUs
- C and generated assembler output
- all HTML pages dynamically created on-the-fly from C code
- invokes my own syntax-highlighting processor and chart-generator
- long and detailed explanation of the ideas behind all these bit-twiddling tricks

sunshine.stephan-brumme.com and moon.stephan-brumme.com since 2004
- instant 2D and 3D computation of current day/night view of the earth respectively moon phases
- shades about 300k pixels/second with ray-tracing algorithm – just with a scripting language (PHP)

wm2010.stephan-brumme.com 2010
- betting on soccer games of the world cup 2010
- intended to be much faster than anything available:
  - front page handles a total of 304 SQL queries in less than 100ms
  - using NoSQL techniques to buffer database results
  - with warm caches, front page is created in ~34ms
- live update of tables and graphics (progress bars, bet distribution etc.)

oz.stephan-brumme.com 2004
- blog written in 2004 about my exchange study in Sydney
- my own template-based content management system, driven by PHP and XML
- automatic handling of images and videos (resizing, caching, extracting meta-data)
- including user comments

status.stephan-brumme.com since 2010
- live analysis of my Apache logfiles
- emphasis on Ajax/JSON for interactive page updates

Note: This document was updated on November 28, 2011. The most recent version can always be found online (www.stephan-brumme.com/aboutme/vitae.html)