

## Curriculum Vitae

Independent Game Developer and Software Consultant

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### Professional Profile

Being blessed with an early interest in computers, I got involved in the software industry during my high-school years; working with PC magazines as a writer and software editor I got connected to a few computer game companies here, there and abroad and turned my hobby into a career while studying Computer Science and Physics in Aarhus.

My experience doing programming, graphics, sound and music for a multitude of games on the early home computers provided me good training for the more competitive world of video console games; I started working for a couple of California-based companies and co-authored and developed games that were successfully published for the Sega Genesis system.

After creating a 3D terrain rendering engine for a PC-based game project I returned from the States to join Interactive Vision, a Danish game developer, as Head of Development. We published the helicopter game "Search and Rescue", instigating a successful sequel of flight simulator titles. My main projects for this company became the construction of a modularized and reusable game framework (3D graphics engine, 3D sound engine, physics simulation, network play, device drivers and tools) and the development of the futuristic 3D shooter "B-Hunter".

The years in the competitive and dynamic computer game industry - when the battle was fought on having the best proprietary middleware such as physics simulators and hand-optimized graphic pipelines - have trained my skills at paying attention to the quality of details - and the details of quality. And even if my early career (and the fact that I started building a family at the time) was prolonging my studies, I earned some good experience points envisioning, building and successfully shipping large and robust systems and doing technical lead and mentoring for younger team members.

Graduating from the University of Aarhus in 1999, I started working for Mjølner Informatics, an IT consultancy company touching down on various industries including telecom, defense and the electronics industry. Working at Mjølner for 8 years has broadened my scope and taught me solid, senior level skills that complement my studies and my experience from the creative game industry; Due to the nature of work at Mjølner at the time (in-sourcing technically demanding projects from various industries) I have been involved with numerous industrial customers and projects, giving me valuable insight in architectures for embedded platforms, for telecom and network communication and for enterprise solutions, in quality assurance for mission critical systems, test methodologies and software process improvement.

After 8 years at Mjølner I sought new horizons and accepted a position as Software Engineer with focus on 3D software at Lego. I have been contributing to Lego's published digital brick building software, but my main involvement has been with the internal construction and transformation pipeline for Lego's digital 3D assets, supporting existing workflows and new business initiatives and tying 3D software solutions together, cross-organizational-wise, for internal and external customers.

In 2008 I heeded a long-growing urge to stand on my own feet and I launched, as sole proprietor, my independent game development and software consultancy business called Brainphant. Since then I have successfully been running this business with several short and long term involvements with various customers while having the opportunity to engage in interesting and technically challenging projects on my own. I have designed and developed a proprietary 3D platform for iPhone OS and Windows, and in early 2010 Brainphant published its first entirely home-grown, one-man iPhone project, the well-received game "Vertigo Rogue".

As an independent consultant, I've continued the work with improvements on the tool chain and 3D asset pipeline at Lego, I've helped Danish ebay successfully develop and launch the first version of the 'Den Blaa Avis' customer-to-customer iPhone app (immediately becoming the #1 downloaded app in Denmark), and I've helped prototype and develop an augmented reality iPhone app bringing a medieval castle in Jutland back to life.

Starting in 2011 and through the following 6+ years I did consulting work for Bromium Inc., a Silicon Valley company with offices in Cupertino (US), and Cambridge (UK), producing cutting-edge security software using next generation virtualization technologies. The work on this highly technical and complex security product (which hooks into the Windows stack at virtually any level) has given me both deep and broad insights into OS architecture and implementation spanning e.g. boot-level kernel drivers, file system filters, hypervisors, services, inter-process communication, installation technology and advanced upgrade architecture - while constantly balancing implementation issues with UI and UX considerations and customer requirements.

In 2017 and 2018 I've been consulting in an agile environment for a major Danish company, developing 3D modelling and documentation tools for internal use and interfacing with elaborate (and continuously restructured) production database systems. Specifically, I've developed complex and innovative algorithms for analyzing and modifying 3D assets for this system.

Since Summer 2018 I've been engaged in full-stack development in the financial sector, implementing business logic for containerized deployment on modern platforms and adapting to emerging, statutory banking standards, specifically focusing on authentication and authorization in a PSD2 context.

In February 2019 I published the mobile game Runny Duck for IOS and Android, a hobby project and the type of one-man endeavour that I fancy in my spare time to train my skills at end-to-end project management and development, to learn new technologies, to stay sharp and to balance my work life between the colorful, creative arts and the more academic, technical challenges of computer science, both of which I enjoy and depend on in order to thrive.

As such, my experience and interests have always had a broad scope and are exploratory and expanding by nature rather than limited to a narrow focus on a few technologies. I'm not scared of new areas and I'm particularly passionate about mobile development, 3D graphics at large, building sound and robust architecture, meeting customer needs above and beyond, and areas of high technical challenge in general.

I was born in January 1970 and live in Silkeborg in central Jutland. I am open minded with a positive attitude and a "just let's do it!" mindset, never considering a challenge insurmountable. I think of myself as a polite, relaxed and creative person who enjoys cooking, running, reading & writing, playing music, doing nerdy computer projects as a hobby and spending humorous time with other people.

## **Professional Summary**

I consider myself very innovative with a flair for developing an overall understanding of problems while retaining focus. I have worked with computer graphics programming for more than two decades and have experience in technical leading and coordination of projects, including object-oriented design, test methodologies and architectural experience and skills. I have a passion for technical aspects such as optimization and algorithmic challenges; experience with and talent for analyzing complex and performance critical scenarios and delivering effective and well-balanced solutions.

I have an extensive knowledge of a broad range of hardware platforms, experience with software platforms ranging from embedded and mobile operating systems to enterprise frameworks and I am specialized in 3D graphics, the math behind it and the aggressive, low-level performance optimizations bringing it to life.

Running my own business, working with software publishing and negotiating terms and requirements with external customers for many years has provided me an important understanding of the coupling between the

technical aspects of project management & implementation and the realm and context of hard-life business requirements.

Naturally, I've been producing as well as presenting documentation in English and Danish during the last decade or more and always enjoyed it as a complement to the more technical parts of the work.

## Previous Employment

2008-now	Owner of Brainphant; Software Consultancy and Independent Game Development
2007-2008	Senior 3D Software Engineer at Lego (4000+ employees); 3D Graphics and Tools, 3D Asset Management
1999-2007	Senior Software Engineer at Mjølner Informatics A/S (~75 employees); Software Development
1996-1999	Head of Development at InterActive Vision A/S (10-50 employees); Computer Games and Flight Simulation
1994-1996	Self-employed, full-time Independent Software Consultant and Game Developer; IT-consultancy/development: Game Development and Frameworks, Graphic Engines, Flight Simulators
1988-1992 and 1999-2002	Freelance Independent Software Consultancy, primarily for Interactivision A/S; Software development, primarily Computer Games
1985-1988	Editor, writer at various Danish computer magazines; Writing reviews and technical articles, programming

## Education, Courses, Conferences

1999	M. Sc. in Computer Science (minor in Physics) from the University of Aarhus
2000	One week training seminar in Project Management at Delta ( <a href="http://www.delta.dk">www.delta.dk</a> )
2003	Software Test Seminar at CSI, Sønderborg
2005	Project Leader Seminar at Mjølner
2006	Software Architect Seminar at Mjølner
2006	J2EE Studies (group seminars, exercises) at Mjølner
2007	Personal Development course, Lego
2008	Certified trained Adam 4.x Developer (.NET platform, <a href="http://www.adam.be">www.adam.be</a> ; Training: Ashton Court)
1994	Consumer Electronics Show, Las Vegas
1997	Develop '97, game developer conference, London
2008	Game Developer's Conference (full program), San Francisco

## Competencies and Experience

Roles	Level	Years	Last
Project Manager	High	3+	2010
Technical Lead	High	9+	2006
Developer	High	20+	2019
Architect	Medium	4+	2016
Programming Languages	Level	Years	Last
C, C++ (incl. C++14, C++17)	High	20+	2018
C# / .Net / WPF/xaml	Medium	4	2019
Assembly (10-12 different platforms)	High	11	2006
Java	High	4	2019
Javascript, HTML, CSS	Medium	2	2019
Objective C	High	1	2011
Various scripting and configuration (batch, vbs, python, sh/bash, yaml)	Medium	5	2019

<b>Development Tools and Environments</b>	<b>Level</b>	<b>Years</b>	<b>Last</b>
MS Visual Studio (incl. 2017) - C++ / VB / C# / .Net	High	15	2018
Unix suite: gcc, gdb, gcov/gprof, valgrind, lint, emacs	High	7	2010
Git, ClearCase, CVS, SVN, Perforce, Gitlab/Bitbucket	High	15	2019
Compaq/Intel compilers & debuggers (Alpha/Itanium)	High	5	2006
IntelliJ / Idea, ant, Gradle	Medium	1	2019
Docker, Vagrant, Helm	Medium	1	2019
Kubernetes/OpenShift, Jenkins, Apigee	Low	1	2019
<b>Supplementary Competencies</b>	<b>Level</b>	<b>Years</b>	<b>Last</b>
Unity3D	High	3	2019
Qt UI (MVC, Item Models, qss-styling etc.)	Medium	2	2018
IOS and Android	High	3	2019
DirectX, OpenGL, Win32	High	11	2017
Linux / Unix / Solaris / Tru64 (debian, sling, ubuntu, ...)	High	6	2007
J2EE, Java 8	High	5	2019
MFC, COM	Medium	8	2017
JBoss, Oracle/SQL	Medium	1	2006
RTOS in general (embedded)	Medium	2	2004
WinCE .Net	Medium	1	2004

<b>Specific Mobile Competencies and Experience</b>
Developing applications (both 3D games and 2D consumer apps) using XCode on Mac for iPhone (Apple's IDE for Mac and IOS development)
Developing applications using Unity3D / Mono on Windows, Mac and PC for IOS and Android
Managing Apple developer certificates, application identifiers and provisioning profiles, including Ad-Hoc provisioning (distribution and deployment on external tester's devices)
Rapid testing using iPhone/iPad simulator on Mac
Building 'Universal Apps' (one binary that runs on iPhone, iPod Touch and iPad)
Submitting, publishing and upgrading free and paid apps on Apple App Store and Google Play Store
Programming in Objective-C and C++ (and integration between both languages) on iPhone
Programming in C# and Javascript for iPhone and Android platforms (Unity3D)
Optimization using profiling and other instrumentation with special focus on memory footprint and battery usage
Experience with framework structure and IOS SDK / knowledge base (sample applications and best-practice) on iPhone in general
High level of experience with frameworks for OpenGL (3D graphics), openAL (sound), accelerometer, GPS, touch input etc.
Writing socket communication between iPhone simulator, physical iPhones and PCs (implementing advanced development and test frameworks)
Implementing semi-automated tool chain for converting audio and 2D image assets to iPhone native formats

<b>Languages</b>	<b>Written</b>	<b>Oral</b>
Danish	Native	Native
English	High	High
German	Medium	Medium
French	Low	Low

## Major Projects

The following table provides a comprehensive overview of technologies I have used in various projects and is primarily intended as a reference for someone looking for a specific competence.

2018 -2019	<b>Customer:</b>	Financial/banking sector
	<b>Project:</b>	Backend systems, implementing business logic and conforming to PSD2
	<b>Roles:</b>	Software Engineer
	<b>Technologies:</b>	Java, Docker, Vagrant, OpenShift, OAuth, Apigee, Jira, Cucumber, Selenium
2017 -2018	<b>Customer:</b>	Major Danish/global company (15K+ employees)
	<b>Project:</b>	3D software tools supporting internal processes
	<b>Roles:</b>	Software Engineer
	<b>Technologies:</b>	VS2017/C++, Qt, 3D, OpenGL, git/gitlab, Jira/Confluence, unit test
2011 -2017	<b>Customer:</b>	Bromium, Inc. (200 employees)
	<b>Project:</b>	vSentry, Advanced Endpoint Security
	<b>Roles:</b>	Software Engineer
	<b>Technologies:</b>	C++, C#, javascript, python, Windows Installer + WiX, git, hypervisor/VM, Jira
2011	<b>Customer:</b>	ebay / Mjølner
	<b>Project:</b>	'Den Blaa Avis' iPhone App
	<b>Roles:</b>	Software Engineer
	<b>Technologies:</b>	IOS, UI, Objective-C, integration with backend, profiling and optimization, deployment, google analytics, JSON
2010 - 2011	<b>Customer:</b>	InnoPro Aps
	<b>Project:</b>	'Kalø Castle Ruins' IOS App
	<b>Roles:</b>	Software Engineer / Consultant
	<b>Technologies:</b>	IOS, UI, Visualization / Augmented Reality, Unity3D, Mono C#/javascript, GPS, terrain height data and textures, 3D mesh construction and cleanup
2009 and 2010	<b>Customer:</b>	Alexandra Institute A/S
	<b>Project:</b>	@aGlance (www.aglance.dk) - research project: 3D terrain visualization, GPS, video analysis and projection, collaboration
	<b>Roles:</b>	Software Engineer
	<b>Technologies:</b>	C++/Win32, OpenGL, PalCom, cvs, Java
2009 - 2010	<b>Customer:</b>	Brainphant
	<b>Project:</b>	Development of 3D game (including construction of proprietary platform from scratch) for iPhone and iPad
	<b>Roles:</b>	Managing and development incl. design, programming, texture artwork, 3D models, sound effects and music
	<b>Technologies:</b>	IOS, OpenGL, Objective-C, C++, XCode, gdb, Blender, Audacity
2007 - 2010	<b>Customer:</b>	LEGO
	<b>Project:</b>	Development of platform and tools for 3D asset management and production pipeline for internal use and external partners
	<b>Roles:</b>	Developer, architect, consultant, integration
	<b>Technologies:</b>	C++, C#, ASP.NET, Python, Maya/MEL, Perforce, opengl
2006 - 2007	<b>Customer:</b>	International telecom organization
	<b>Project:</b>	Optimizations and new functionality on proprietary IP stack (Linux, portable, C); code generation and reflection
	<b>Roles:</b>	Developer, designer
	<b>Technologies:</b>	C (iso99), gcc/gdb/gcov/gprof, CVS, valgrind, lint, TCP/IP

2005 - 2006	<b>Customer:</b>	International telecom organization + International telecom/network corporation
	<b>Project:</b>	Development of test framework and runtime optimization of mission critical Virtual Machine on 64-bit telecom switch + Server applications and adapters for charging systems in network systems.
	<b>Roles:</b>	Project manager, architect and developer
	<b>Technologies:</b>	C++, ClearCase, Assembly (Alpha, Itanium) + J2EE / EJB, JBoss, Oracle
2004	<b>Customer:</b>	Danish telecom industries
	<b>Project:</b>	Hardware simulator and test framework (incl. high level test language and parser) for telecom platform. Driver development and integration in WinCE .Net.
	<b>Roles:</b>	Team lead, designer and developer
	<b>Technologies:</b>	C/C++, embedded
2003	<b>Customer:</b>	Large Danish industrial automation / electronics corporation
	<b>Project:</b>	Embedded software development, including test framework analysis and design, tools development (J2SE) and time and space critical implementations on several embedded platforms (C and C++, various custom RTOS).
	<b>Roles:</b>	Team lead, designer and developer
	<b>Technologies:</b>	C, C++, J2SE and various custom RTOS
2002	<b>Customer:</b>	Defense industry
	<b>Project:</b>	Defense project running on a mixture of J2EE beans and J2SE clients (Swing on Unix) communicating on JMS.
	<b>Roles:</b>	Team lead, designer and programmer
	<b>Technologies:</b>	J2EE, J2SE, JMS
1999 - 2002	<b>Customer:</b>	International telecom organization
	<b>Project:</b>	Large project involving JIT compiler design, implementation and optimization on 64-bit platforms, including experience with capacity critical and mission critical systems in the telecom industry.
	<b>Roles:</b>	Designer and developer
	<b>Technologies:</b>	C++, ClearCase, Assembly (Sparc, Alpha)
2000 - 2002	<b>Customer:</b>	InterActive Vision A/S
	<b>Project:</b>	Consulting on smaller projects, including development of fast 3D engine for computer games on Palm Pilot and GameBoy Advance, 3D visualization of physics simulations using RenderWare platform (PC, PS2, Xbox).
	<b>Roles:</b>	Consultant
	<b>Technologies:</b>	C/C++, Assembly (Motorola, ARM, Intel), DirectX
1996 - 1999	<b>Customer:</b>	InterActive Vision A/S
	<b>Project:</b>	Coordination, programming and development of computer game projects, flight simulators and industrial visualization tools. Design of large, modularized development system for Windows and 3D graphics and physics engines with special attention to performance and real-time techniques.
	<b>Roles:</b>	Technical lead
	<b>Technologies:</b>	C/C++, BRender, Win32, DirectX
1993 - 1996	<b>Customer:</b>	Asciiware; Technopop; Sega
	<b>Project:</b>	Computer games for PC and Sega consoles for U.S. companies (games published in U.S. and Europe).
	<b>Roles:</b>	Development and programming

	<b>Technologies:</b>	Assembly (Motorola, Intel), C/C++, Embedded
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<b>1988 - 1992</b>	<b>Customer:</b>	InterActivision A/S
	<b>Project:</b>	Software development and programming for various platforms for Danish company, mainly computer games (published in Germany).
	<b>Roles:</b>	Development and programming
	<b>Technologies:</b>	Assembly (Motorola, Z80), C, Raster Graphics