

Curriculum Vitae

Personalialia

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Date of Birth: June 21, 1969

Education

1994–1999 PhD in Computer Graphics at the department of Mathematics and Computing Science of Eindhoven University of Technology.
Research: methods for collision detection in interactive 3D computer animation; design and implementation of SOLID, a software library for collision detection. Source code and documentation available at <http://www.win.tue.nl/~gino/solid>.
Courses: didactics, technical writing, theoretical mechanics, numerical analysis.
Teaching: Modula-2, object-oriented programming.

1987–1992 MSc in Computing Science ‘met lof’ (‘summa cum laude’) at Eindhoven University of Technology.
Master’s assignment: online algorithms for computing the contour of the union of a collection of iso-oriented rectangles (computational geometry).

Employment Record

Apr 2008–present Self-employed as DTECTA, Helmond. Consultancy and contract development in interactive 3D graphics and physics.

Sep 2007–Mar 2008 CTO of Virtual Proteins B.V., Eindhoven. Design of augmented-reality software for scientific visualization. Product information available at <http://www.virtualproteins.com>.

Feb 2003–Aug 2007 Programmer at Playlogic Game Factory, Breda. Last year and a half as Lead Programmer on projects for SCE Studios London. Technical lead on a project developing a procedural landscape engine for PS3. Key features: infinitely large landscapes, smooth LOD, foliage fur, billboard trees, seamless transition of different terrain types, detail color and normal mapping, animated water surface and shoreline waves. Video available at

http://www.youtube.com/watch?v=_WeeOv0CtoM.

Previous experience with this company: physics programmer for the PS2 title *Cyclone Circus*. Key features: vehicle simulation, flight simulation, continuous collision detection. Title and company information available at <http://www.playlogicinternational.com>.

Oct 2001–Dec 2002 Lead Programmer at Cebra B.V., Eindhoven. Design and implementation of *VirtuoCity*, a platform for interactive 3D over broadband internet. Key features: real-time networking, user interaction using physics-based simulation, arbitrary large worlds due to distributed simulation. Project and company information available at <http://www.cebra.eu>.

May 2001–Sep 2001 Self-employed as DTECTA, Eindhoven. Develop and license the SOLID collision detection library. Worked as freelance developer and consultant in the field of 3D game technology.

Mar 2000–Apr 2001 Physics Programmer at Not a Number B.V., Eindhoven. Design and implementation of a game physics engine for *Blender*, a 3D-content creation suite. Key features: exact collision detection, impulse-based rigid body dynamics. Product information available at <http://www.blender.org>.

Jan 1999–Feb 2000 Software Engineer at VDO Car Communication, Eindhoven. Development of embedded route-planning software for car navigation systems. Study of AI methods for finding optimal paths on dynamic networks.

Courses: Design and Technical Design of Real-Time Systems.

Publications

- G. van den Bergen. Smooth Mesh Contacts with GJK. In Gino van den Bergen and Dirk Gregorius (editors), *Game Physics Pearls*, pages 99–123. A K Peters, July 2010.

- K. van Kooten, G. van den Bergen, A. Telea. Point-Based Visualization of Metaballs on a GPU. In Hubert Nguyen (editor), *GPU Gems 3*, pages 123–148. Addison Wesley, August 2007.
- G. van den Bergen. Efficient Collision Detection of Complex Deformable Models using AABB Trees. In Ronen Barzel (editor), *Graphics Tools: The JGT Editor's Choice*, pages 131–144. AK Peters, Ltd., August 2005.
- G. van den Bergen. Continuous Collision Detection of General Convex Objects under Translation. In *Proc. Game Developers Conference 2005*, <http://www.gdconf.com>, 2005.
- G. van den Bergen. *Collision Detection in Interactive 3D Environments*. Elsevier Morgan Kaufmann Publishers, November 2003.
- G. van den Bergen. Proximity Queries and Penetration Depth Computation on 3D Game Objects. In *Proc. Game Developers Conference 2001*, pages 821–837, 2001.
- G. van den Bergen. A Fast and Robust GJK Implementation for Collision Detection of Convex Objects. *Journal of Graphics Tools*, 4(2):7–25, 1999.
- G. van den Bergen. Efficient Collision Detection of Complex Deformable Models using AABB Trees. *Journal of Graphics Tools*, 2(4):1–13, 1997.

Presentations

- Lecturer at the 2009 Game Developers Conference Europe, held August 17–19, 2009 at the Cologne Congress Center, Cologne, Germany.
- Faculty member for the Game Physics Tutorial at the Game Developers Conference 2006–2009.
- Lecturer at the 2005 Game Developers Conference, held March 7–11, 2005 at the Moscone Center, San Francisco, CA.
- Speaker at the 2005 International Workshop on Motion Planning in Virtual Environments, held January 7–8, 2005 at the LAAS-CNRS, Toulouse, France.

- Lecturer at the 2001 Game Developers Conference, held March 20–24, 2001 at the San Jose Convention Center, San Jose, CA.
- Invited speaker at the Game Developers Conference 1999 Hardcore Seminar, held December 6–9, 1999 at The Hyatt Regency, San Francisco Airport.

Expertise

- **3D Graphics:** GPU programming, 3D geometry, computational geometry, geometric data structures, geometric-data compression.
- **Physics:** collision detection, contact and constraint resolution, flight dynamics, articulated-body mechanics (Featherstone), fluid dynamics (SPH), numerical analysis.
- **AI:** Pathfinding (Dijkstra, A*), alternative-path planning, dynamic path planning.
- **Real-time Networking:** Low-latency client-server communication over internet (TCP/IP, UDP) for interactive applications.
- **Software Development:** Cross-platform software development in C and C++. Generic programming. Template meta-programming in C++. Design Patterns. Design by Contract.

Programming

- **Languages:** C++, (pre-)ANSI C, Cg.
- **Platforms:** Windows (32- and 64-bit), Linux (32- and 64-bit), Solaris, Irix, AmigaOS, OS-9.
- **APIs:** STL (Standard Template Library), OpenGL, GLUT, SDL (Simple DirectMedia Layer), RenderWare, 3ds Max SDK, COLLADA DOM, OpenSceneGraph, wxWidgets, VTK, ARToolKit, OpenHaptics, TBB (Threading Building Blocks).
- **Tools:** Microsoft Visual Studio 6.0 to 9.0, CVS, Subversion, GNU Development Tools (emacs, gcc, gdb, gprof, automake, autoconf, libtool), Rational Purify and Quantify, Metrowerks CodeWarrior and CATS, NVIDIA FX Composer. Intel Parallel Studio.
- **Assembler:** Intel SSE, Motorola 680x0, MIPS (PS2).

Miscellaneous

- **Reviewing:** Reviewer for *Graphical Models and Image Processing*, SIGGRAPH 2002, *IEEE Computer Graphics and Applications*, *IEEE Transactions on Visualization and Computer Graphics*, *IEEE Transactions on Robotics*, and Morgan Kaufmann Publishers, Eurographics 2008, SIGGRAPH Asia 2010, ACM Transactions on Graphics.