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Resume of Gabor Nagy

www.equinox3d.com

A highly quality-oriented software architect and electrical engineer (CS + EE dual degree) with extensive international experience in software design / development, electronics and robotics. Proven full stack engineering skills, creating large systems from “big picture” down to the hardware level.
A rare combination of 3D graphics, software, hardware engineering, mechanical engineering, VR/AR, CAD/CAM, robotics, machine vision/AI and 3D art design skills.
I designed and built my first PCB at 11 and sold my first software at 15, to the largest distributor in the country.

Main skills and interests

- Designing and building extremely complex, highly efficient and robust software and hardware systems with clean and efficient APIs.
- Advanced 3D graphics programming, from state of the art 3D modeling, CAD / CAM, to animation, mechanical simulation and photo-realistic rendering, for animation, video, VR / AR. robotics, etc.
- I'm the creator/developer of EQUINOX-3D, a full-featured 3D modeling, CAD/CAM, animation and rendering software suite. EQUINOX-3D is often orders of magnitude faster than commercial 3D software packages, with comparable functionality, but with less than a million lines of robust, clean and well-documented code.
- 3D artwork (see image gallery and movies), and Web design.
- Robotics. Building a cutting-edge, bio-mechanically / anatomically accurate humanoid robot.
- CAD / mechanical design, 3D printing. Implemented many CAD / CAM features in EQUINOX-3D and designed many complex, functional parts for our robot.
- Virtual reality and augmented reality. Designed and built my own, patent pending VR headset, and created all the software and 3D content for 3 demos.
- 3D art content and production pipeline for games, VR / AR and high production quality demos.
- Advanced, heterogeneous parallel programming. CPU + GPU, pthreads, OpenCL, OpenGL etc. (EQUINOX-3D scales almost perfecly linearly to many cores and GPUs).
- VR and AR, with low-latency user interaction (see EQUINOX-3D's interactive ray-tracer and VR / AR support with live 3D video feed).
- Real-time asynchronous video processing, machine vision, augmented reality (teleoperated humanoid project, with HMD control, stereo vision and 3D HUD).
- Image processing, digital image sensors, HDR imaging: wrote EPaint and 2DLib (a library used by EQUINOX-3D and EPaint).
- Scientific visualization, terrain rendering, satellite image processing, real-time weather imagery in 3D. See here and here
- User interface: created the Xe GUI toolkit and designed/created the GUI for EQUINOX-3D and other applications. Co-developed a programmer's text editor.
- Object-oriented design : implemented my own C99-based OO runtime with much more efficient RTTI, reflection, dynamic casting etc. than that of C++.
- Network programming (TCP/IP sockets, UDP, signal-driven, multi-threaded design).
- UNIX / Linux / Mac OS-X system administration.
- Public speaking, creating rich material (slides, demo applications, 3D artwork) and teaching (optional) classes about 3D graphics programming at Sony, to packed rooms.

Programming languages and systems

- C/C++, GLSL, Cg, CUDA, OpenCL, Nvidia OptiX, Java/JavaScript, HTML5, CSS, assembly.
- OpenGL, Mac OS-X, UNIX/Linux, Android, X11, PlayStation-2, 3 and 4.
- EQUINOX-3D, CADsoft EAGLE EDA for electronics design (schematics + PCB).

Work experience

- Skyline Robotics - Founder 2013-present

- Robotics start-up, cutting-edge humanoid robot development.

- Sony Computer Entertainment America, R&D group 1998-2013

- Real-time, photo-realistic rendering research for future generation graphics hardware.
- 3D environment artwork and programming for the famous duck demo, shown at the introduction of the PlayStation-3 at E3 in 2005, rendering and some of the animation for the underwater / fish demo at the 2006 GDC keynote, and many others.

- ALIAS|WAVEFRONT, Toronto, Canada 1996-1998

- 3D modeler development for Power Animator and Maya. Polygonal boolean operation tools and others.

- SEGA of Japan Ltd. Tokyo 1994-1996

- Virtual Reality research, using head-mounted displays and electromagnetic spatial sensors. Implemented the stereoscopic VR rendering engine with 6 DOF head tracking, created the 3D art work. We successfully demoed the system to Steven Spielberg (and his son, Max), when he was starting Dreamworks.
- Co-designed and built a real-time motion-sampler armature (hardware and software), and developed custom software tools for game designers.

- “Self-employed”

- I sold my first software at the age of 15 (a DTP application) and designed/built/sold computer components with custom PCBs, during high school.

Publications

- 2010: 'Inferring Caravaggio's studio lighting and praxis in The calling of St. Matthew by computer graphics modeling'. International society for optics and photonics (SPIE) conference. Co-authored with David G. Stork.
- 2000: 'Convincing-looking glass for games' - Game Programming Gems - Charles River Media
- 2000: 'Real-time shadows on complex objects' - Game Programming Gems - Charles River Media

The book 'Game Programming Gems', sold 10s of thousands of copies, and was translated to 14 languages.

Patents

I hold 3 granted patents related to 3D graphics and GPU hardware, one pending for a VR headset and one in progress, for mechanical a design in robotics.

Education

Kando Kalman University Of Technology, Budapest, Hungary.
Computer science / Mathematics faculty, Software technology dept.
Thesis: 'DELTALink™' networking system.
Field of study: Electronics engineering, computer architectures and software design.
Qualification: Dual BSc. in Computer Science and Electrical Engineering.

Languages:

English (fluent), Hungarian (native), Japanese (very basic).

Other skills and interests:

- Flying: I'm an 850-hour private pilot with an airplane instrument rating and a helicopter rating.