Updated: December 10, 2023

Resume of Gabor Nagy

Software architect / engineer, electrical engineer (CS + EE dual degree) and pilot (airplane + helicopter) with extensive international experience in software design / development, VR, AR, 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 10 and sold my first software at 14, to the largest distributor in the country.

Main skills and interests

- I'm the creator/developer of EQUINOX-3D™, a full-featured 3D modeling, CAD/CAM, animation and rendering software suite, and the FusionEngine™ rendering / game / VR / AR engine. 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.
- Designing and building 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.
- 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 several complex, functional parts for our robot.
- VR and AR with low-latency user interaction. Designed and built my own VR headset, and created all the software and 3D content for several VR and AR demos. (See EQUINOX-3D's interactive ray-tracer and VR / AR support with live 3D video feed).
- 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 perfectly linearly to many cores and GPUs).
- 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, weather imagery in 3D. See here.
- User interface, UI / UX: created the Xe GUI toolkit and designed / created the GUI for EQUINOX-3D and other applications. Co-developed a programmer's text editor.
- Advanced object-oriented design : implemented my own C99-based OO runtime with much more efficient RTTI, reflection, dynamic casting etc. than that of C++ (one of the reasons EQUINOX-3D starts up in milliseconds and is fast, even on ancient computers, vs. other 3D apps that take minutes to launch, and are too slow to use on anything older than a few years).
- Network programming (TCP/IP sockets, UDP, signal-driven, multi-threaded design).
- UNIX / Linux / Mac OS-X system administration.
- 3D artwork (see image gallery and movies), and Web design.
- Public speaking, creating rich material (slides, demo applications, 3D artwork) and teaching successful classes about 3D graphics programming at Sony, to packed rooms (classes were optional to attend).

Programming languages and systems

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

Work experience

Small contract jobs for NASA flight system research 2022

Apple Inc 2019-2023
- Senior 3D graphics engineer, AR / VR.

Facebook
- Senior 3D graphics engineer, social VR.

Magic Leap 2017-2018
- Senior graphics engineer, applications.

Skyline Robotics - Founder, CEO 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 programming and artwork for the famous duck demo, shown at the introduction of the PlayStation-3 at E3 in 2005, all rendering and some of the animation for the underwater / massive schools fish demo at a GDC keynote, and many others.

ALIAS|WAVEFRONT, Toronto, Canada 1996-1998
- 3D modeler development for Power Animator and Maya.

SEGA of Japan Ltd. Tokyo 1994-1996
- VR research, using head-mounted displays and electromagnetic tracking. Created the 3D 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.
- 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 14 (a desktop publishing application) and designed/built/sold computer components with custom PCBs, during high school.

Publications

- '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.
- 'Convincing-looking glass for games' - Game Programming Gems - Charles River Media
- '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, and two pending for AI/ML and 3D graphics.

Education

Kando Kalman University Of Technology (now Obuda University), Budapest, Hungary. Computer science / Mathematics faculty. Dual BSc. in Computer Science and Electrical Engineering.

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

Other skills and interests

- I'm an 1100+ hour private pilot (airplane single and multi-engine, instrument airplane and helicopter)