Kornél Lehőcz

Software development consultant
klehocz@scarablabs.com
www.scarablabs.com

Skills and experience

- I am fluent in C++ (20 years of professional experience).

- Nearly a decade of GPU programming experience using Direct3D, OpenGL, OpenCL, and CUDA.

- I have an excellent knowledge of image and video processing, and am capable of designing cutting edge algorithms in this field.

- Good knowledge of computer vision – classical techniques, as well as deep learning based approaches.

- Broad expertise in artificial intelligence and machine learning, with lots of experience using deep neural networks for image processing.

- A lot of prior experience working on computer graphics for games – engine architecture, visual effects, and shaders.

- I am adept in profiling and optimizing code for speed, memory, and power usage.

- I have experience working in Windows, macOS, and Linux environments, targeting these platforms, as well as game consoles, mobile (iOS and Android), and embedded devices.

- Application GUI programming experience using .net, wxWidgets, and Qt.

- Familiarity with numerous libraries, including: STL, Boost, OpenCV, IPP, NumPy, and TensorFlow.

- Experience working with Visual Studio, Android Studio, Xcode, Git, VTune, CMake, Jira, Confluence, and many other tools.

- Multi-threaded programming (POSIX threads, Windows API, and OpenMP).

- Experience with the Adobe After Effects and Photoshop SDK-s.

- I also programmed in other languages, such as Python, C, Objective-C, C#, Matlab, and assembly.

- Other skills: Unix, ROS, TCP/IP sockets, design patterns, SQL, XML, basic HTML and CSS.

Language proficiencies

Hungarian - native	English - full professional working proficiency
German - professional working proficiency	Swedish - limited working proficiency

Education

I obtained a Programmer Mathematician degree from the University of Debrecen in 2007.

Work history

Principal Programmer **May 2008 – present**
Scarab Labs *Balingen, Germany / Stockholm, Sweden*

I created Scarab Darkroom - a digital camera raw converter and photo editor, and various Adobe Photoshop and After Effects plug-ins. I developed numerous image processing algorithms, including a fast, high quality demosaic algorithm, and several noise filters, among them a deep learning based approach. I am currently working on a video enhancement SDK for Android featuring motion blur reduction, image stabilisation, and denoising. I also help other companies with algorithm development, optimisation, and GPU programming. My clients come from varous industries, including automotive, robotics, and defense. (See below for a selection of client-projects.)

GPU Software Engineer (contract) **July 2019 – September 2019**
Imint *Uppsala, Sweden*

Optimization of video processing algorithms running on the GPU (using OpenGL ES 3.1 and OpenCL 2.0) for lower battery usage on Android devices, and porting of an algorithm to OpenCL.

Robotic Algorithm Developer (contract) **July 2017 – December 2017**
Unibap *Uppsala, Sweden / remote*

Development of a robotic grasp planning algorithm and a test / simulation environment suitable for training reinforcement learning agents.

Vision Algorithm Engineer (contract) **September 2016 – March 2017**
Delphi Automotive *Wuppertal, Germany / remote*

I worked in the computer vision algorithm team on an advanced driver assistance system (ADAS) – evaluating and improving algorithms, optimizing them for a Texas Instruments embedded DSP. I also dealt with troubleshooting, debugging, and resolving issues, and creating unit tests. Systems worked on: lane departure warning, camera calibration, camera processing.

Software Development Consultant (contract) **December 2014 – May 2015**
ThyssenKrupp *Kiel, Germany / remote*

Optimizing a 3D CAD data conversion process.

Senior Programmer (contract) **January 2008 – April 2008**
Atomic Motion *Budapest, Hungary*

I worked on the PC / Xbox 360 game Raven Squad, making improvements to an existing 3D engine.

Programmer **April 2006 – July 2007**
Eidos Hungary *Budapest, Hungary*

I worked on Battlestations: Midway. I programmed visual effects, fixed bugs, and resolved frame rate issues. The game became about 15% faster thanks to my optimizations. Later I was involved in creating the prototype of Battlestations: Pacific. I wrote shaders and implemented new features in the 3D engine.

Graphics Programmer   **September 2005 – March 2006**

Bizarre Creations   *Liverpool, UK*

I worked on the company's proprietary 3D engine and on visual effects specific to The Club. I implemented HDR rendering and many other features in the engine, and was in charge of post-processing effects.

Programmer (contract)   **May 2003 – July 2005**

T5 Labs   *remote*

I worked on T5 Labs's game streaming (cloud gaming) technology, specifically on the server side low latency, GPGPU video encoder.

3D Engine Programmer (contract)   **October 2000 – October 2002**

Invictus Games   *Debrecen, Hungary*

I worked on the company's proprietary 3D engine for the PC racing game Street Legal. I wrote all Direct3D specific parts of the engine, and was also involved in developing the content pipeline. I created several plug-ins for 3ds max, including a feature packed export plug-in. I also helped finish Invictus's earlier game, 1NSANE.

AI Programmer   **August 1999 – December 1999**

Deepcore Games   *Budapest, Hungary*

I helped a few friends with their start-up company by writing AI for a racing game prototype. (unpaid / royalty)

Hobby

I have started programming at an early age with the dream of one day becoming a game programmer. In the late 90-s I became involved in the Amiga demoscene, and was a member of the groups Frame 18 and Scoopex. I went on to pursue a career in game development, which I have since left behind me, but I still enjoy playing video games. One of my more recent hobbies is photography. This has inspired me to take an interest in the image processing algorithms used to make the most out of digital camera images, and led to me writing my own photo processing software - Scarab Darkroom.

Softography

Scarab Darkroom (first public release in 2009, latest update 2020)
A digital camera raw file converter and photo editor, which excels with its speed and ease of use.
www.scarablabs.com/scarab-darkroom

Custom Photoshop plug-ins for Stoll AG & Co. KG (2018)
Three plug-ins to help with verifying textile patterns. (Windows/Mac)

Scarab Star Filter 1.0 - 2.0 for Adobe After Effects (released in 2011, 2012)
A plug-in for applying a star filter effect to highlights in video footage.
www.scarablabs.com/star-filter-after-effects

T-Seps 2.0 (released in 2010)
A Photoshop plug-in for making colour separations for T-shirt printing. (Windows/Mac)
t-seps.com

Scarab Star Filter 1.0 - 2.01 for Adobe Photoshop (released in 2009, 2010)
A filter plug-in for applying a star effect to highlights in an image. (Windows/Mac)
www.scarablabs.com/star-filter-photoshop

Raven Squad: Operation Hidden Dagger (released in 2009)
A tactical shooter for Xbox 360 and PC.
www.youtube.com/watch?v=0KS6NbuqO8M

Codename Panzers: Cold War (released in 2009)
A real-time strategy game for the PC published by Atari.
www.youtube.com/watch?v=GIAtxcmfUuc&hd=1

Battlestations: Pacific (released in 2009)
A WWII action strategy game for Xbox 360 and PC.
www.youtube.com/watch?v=23WEAyGLF50

The Club (released in 2008)
A 3rd person shooter published by Sega for Xbox 360, PlayStation 3, and PC.
www.youtube.com/watch?v=i2lauM9ue0w

Battlestations: Midway (released in 2007)
A WWII action strategy game for Xbox 360 and PC. No. 1 hit in the UK.
www.youtube.com/watch?v=i8WXF7_LS1g

Street Legal (released in 2002)
A racing game published by Activision Value.
www.youtube.com/watch?v=B8SsbiFMxYo

1nsane (released in 2000)
An off-road racing game published by Codemasters. 'Best Off-Road Game Ever' – PC Gamer
www.youtube.com/watch?v=YRWxtphpYE0

Prody Parrot 2.0 (released in 1999)
An intelligent assistant for Windows with speech synthesis, voice recognition, and many other features.
https://www.youtube.com/watch?v=W6_Rm64s9LI

Scoopex - Pulsar (released in 1999)
An Amiga 64k intro.
www.youtube.com/watch?v=QXCM6uikUkM

Frame18 - Atmosphere (released in 1997)
An Amiga demo.
www.youtube.com/watch?v=YJpLuohq9b8

Frame18 - Cyclotron (released in 1997)
An Amiga demo.