

# Herbert Elwood Gilliland III

Graphics and Gaming Software Architect, Product Developer, Scientist, Author, Artist and Entrepreneur

Seeking a great place to be creative | [herb.gilliland@gmail.com](mailto:herb.gilliland@gmail.com)



## Work experience

### Senior Software Engineer

Jan 2021

#### Bohemia Interactive Simulations

via Oxford Solutions; Middleware API development for mapping and graphics-related API contract with DoD. Docker, Linux, REST via Swagger/Flask (Python); JSON; GNU Parallel, python multithreading, streaming services, GDAL, GeoTiff, Wine, Cesium, TerraExplorer Pro, automation. Documentation. Agile scrum.

### Lead Graphics Architect / Software Lead: Poser July 2017 - July 2019

#### Smith Micro Software Inc.

Lead Developer and Lead Graphics Architect of the Poser product line for 3D Character Art and Animation as part of the Smith Micro Graphics division. Position included occasional travel to Braga, Portugal, and working through telepresence in Braga, Belgrade, and Alisa Viejo, CA.

Lead of the “Poser” and “Poser Pro” products, managing and extending a tremendously complicated multi-platform 30-year-old C++ source code in Visual Studio versions 2013, 2015, 2017, and xCode 6.4 (MacOS), leveraging both SVN and git, for a graphical desktop application wrangling 100+ third-party libraries as part of a multi-product suite including multiple add-ons, including a bridge via the GoZ SDK (ZBrush); UI development using XML and wxWidgets, including custom widgets, end-user-facing UI views and graphics libraries; maintained a Python exposed C++ API and monolithic SDK.

Main contributions included the development of a 3D paths system for controlling the animation of objects and an extensive set of visual particle effects. Consulting on 3D content like human figure designs, marketing, tutorials, and documentation. JIRA with Support and QE teams based remotely in Virginia and Serbia. Initiator of efforts to move 1000 Adobe InDesign pages of documentation to a Confluence Wiki, including vetting of plugins.

Build automation scripting using Jenkins, Ant, msbuild. As Lead Graphics Architect, responsible for the creation of class block diagrams, user workflows, analysis of existing systems, and thousands of bug reports. Customer-facing representative on user forums.

Secondary project “Redux” involved explorations into Qt5 and OpenGL (with GLSL) in C++ initially constructed using Qt Creator 4.8.0 and eventually the Qt Plugin for Visual Studio. Lead architecture of an entirely new version of the application based on the proprietary NVIDIA GameWorks SDK to bring modern sensibilities to an aging product line. Designed extensions system enabled by the JSON format for describing UIs, widgets, and lead developer and documenter of a C++ / Javascript bridging API for third-party authoring of extensions that control and manipulate 3D objects, data structures, and internal application automation.

### Director of Software

2014 - 2017

#### PieceMaker Technologies Inc.

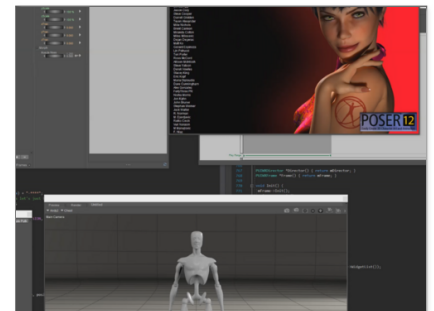
Lead software developer and department founder for a 3D printing-on-demand startup. Instilled various values into the company and provided insight beyond software into business operations, hiring practices and team-building. Managed over 1M lines and authored more than 250k lines during tenure. Position began as a User Interface developer using WebGL to create product mock-ups to assist fundraising at early stage. Licensed personal work in a ground-up custom OpenGL video game engine (for Windows, in Visual C++) to the company, then built a software-driven experience on top

## Portfolio

Below are some hand-picked images showing off various aspects of my more creative graphical projects



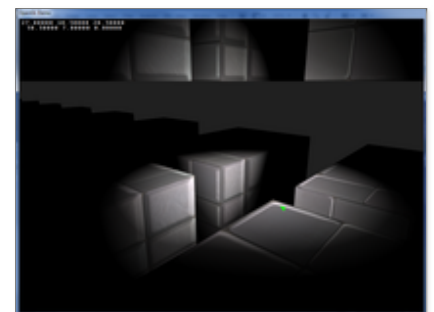
Web Tilemap Editor in Pixi.js



Poser 11.1, 11.2 and 12 Lead



3D Printing Retail System



GLSL Shaders

that won awards including the Best in Toy Fair 2016 from Popular Science. Developed complex cloud-based systems for providing real-time metrics using LAMP stack, tied into a multi-device deployment integrating 3D printers, Windows PC Kiosk with WinTouch device, Ingenico card reader hardware and 3rd party middleware for handling SMS. Lead IT deployment, cloud infrastructure initiatives and purchasing for IT.

## Lead Software Engineer

Sep 2019 - July 2020

### Bloomfield Robotics Inc.

Spearheaded initial development of customer-facing dashboard for BLINK camera, as well as internal portals for intranet. LAMP + Bootstrap + jQuery + AdminLTE; Focused on UI, statistics, charting, reports, image and data analysis. Build initial data infrastructure for edge-to-cloud automation; generating metrics to help industrial growers use a prototype microscopic camera for agriculture. Managed a small team overseeing web, mobile, on-device IoT and AWS. Built out a team of software developers with a focus on customer satisfaction, iterative design and robust SDLC practices. Back-end automation using S3, C++ / MySQL Connector / AWS SDK Cpp



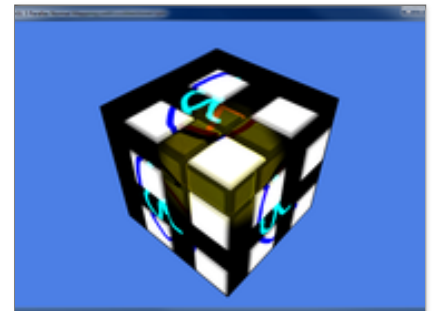
Bloomfield BLINK Dashboard

## Web Developer

- 2013

### Opus One Interactive

Consultant and developer of a CodeIgniter-based contract management software for the music industry.



OpenGL Parallax

## Developer (Contractor)

2012 - 2013

### Garrigan Lyman Group

PHP developer under contract developing sites in Drupal, Wordpress and others for Fortune 500 and Fortune 100 companies.



LAMP

## Contributor

2008 - 2011

### Ecere Corporation

UA/QA position developing a programming language and SDK. Aside from consulting on the eC language and its features, while reporting bugs and issues, Herb developed the Open Art Engine component that enabled functionality for time-based interactive animation with motion tween. Other features included an OpenAL class framework for real-time audio mixing.

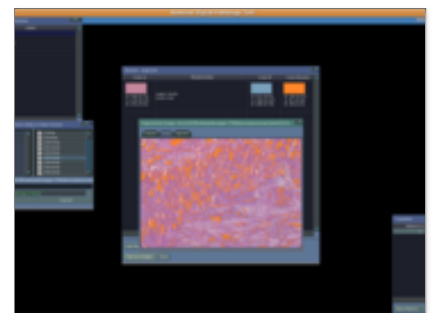


Image Analysis

## Consultant

- 2011

### TeleTracking

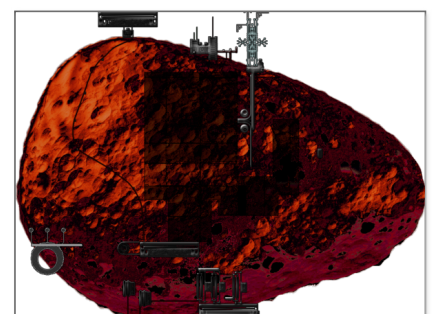
Co-developer, corporate Intranet, Zend Framework / MVC, PHP, Linux, VMWare. GUI, databases (Postgres, MSSQL), CSS/HTML/JavaScript and jQuery. QA/UA. Trained employees.

## CEO

2010 - 2012

### Ganos LLC

Founded in 2010, Ganos LLC is a brand warehouse with many alpha-stage products for the web. Herb brought 3 years of work and research to Ganos LLC and is the majority stakeholder in the business. He is partnered with Woody March-Steinman and Bryan Berns. They operate the start-up as an incubator for online brands.



Cartoon Pixel Art (Photoshop)

## Lead Investigator, Postdoctorate Research

2008 - 2009

### University of Pittsburgh School of Medicine

Lead programmer of the Avenzoar Digital Pathology Tool, a specialized image analysis solution that examined ultra-high resolution images and determined an appropriate diagnosis for cancer. Research was done in a team, and was postdoctoral research. This position involved problem solving, programming in C/C++ and OpenGL.

## C/C++



Not to downplay this skill, but I have my C/C++ writing skill optimized beyond expert level, so my code is too!

## CTO

2007 - 2008

### PickPark LTD

PickPark LTD, a business social website, was cited in Germany as one of the hottest German startups in 2007. Clients included hundreds of companies including Airberlin and other firms in Europe, Asia and the US ranging from startups to established brands. Implemented multi-language content management enhancements (internationalization), built enhancements for a social network for companies, as well as online video tutorials to provide support. Developed an advertising engine built on top of the OpenX advertising network, developed in PHP using the LAMP stack and the OpenX API.

## Technical Writer

2006 - 2007

### Provost Systems

Technical writer who developed 10 software manuals (300+ pages) for a Southern California educational software company that is a competitor to Blackboard. Provided ancillary support as a quality assurance analyst for interface and verification of features as a side-effect of being the technical writer.

## Various Positions, Software and Web Design

Jun 1998 - Dec 2004

### Carnegie Mellon University

Held various positions at Carnegie Mellon from 1996-2004. Project assistant for the Nine Mile Run Greenway Project, hosted at CMU's STUDIO for Creative Inquiry. Working there as an undergraduate, the NMR project interfaced with the mayor, community representatives and developers, as well as the US Army COE. Media Designer for the Electrical and Computer Engineering School. Held a number of student jobs, including gallery assistant, cartoonist for the school newspaper, radio show host and web designer.

Worked for a CMU spin-off called "Grand Illusion Studios" that commercialized Mike Christel, Don Marinelli and Scott Stevens' Synthetic Interview product.

## Education

### Bachelor of Science

Sep 1996 - Dec 2005

### Carnegie Mellon University

INTERACTION DESIGN (self-defined major)

## Summary

Born in Pittsburgh, PA, Herbert Gilliland is an entrepreneur, scientist, artist and musician who spends most of his time developing software for clients and for his indie game studio, Lost Astronaut Studios. He plays the electric guitar.

An early experimenter in digital video technology, Herb has worked for a variety of companies, academic institutions, law firms and charities both in the US and abroad. He has brought his software skills and creative insight into various fields, including biomedical, data processing and visualization, 3D printing, electronics and multimedia.

As an academic, Herb spent time engaged in self-directed interdisciplinary exploration. He studied a self-defined degree, which helped bring Interaction Design to Carnegie Mellon.

## Interactive Real-Time Graphics Experience

Since mid-2006, I have spent time self-teaching myself game engine development on the Microsoft Windows platform. I started with libAgar on Linux, but later moved to Microsoft Visual Studio 2010, and recently have ported my work to VS2015. Through this exploration I have interacted with a variety of industry professionals in the computer graphics industry, spent countless hours developing and refining over 1800

## Linux

Bash, PHP, Perl, cPanel, cli, MySQL, SQLite, Apache2, g++, gcc, gdebug

## PHP

I rock at PHP! I've been an expert at PHP since PHP4, and now I'm writing PHP7, go figure.

## GLSL

GL3.x shaders in GLSL, including light etc., and once I got some deferred shading working. I've handled over 70 different 2D shaders, either writing them myself or implementing published techniques.  
<http://github.com/h3rb/gml-pro>

## HTML

I actually contributed features to HTML5! I've been using HTML since 1.0

## Javascript and the jQuery library, Node.js

Deep knowledge of jQuery, some knowledge of 'Node.js' and Expressjs, I know WebGL and Pixi.js, too

## Photoshop

I signed an NDA with Larry Lightman! How guru is that!!! I'm a subscriber to Photoshop CC.

## J2ME / MIDP / CLDC

I made a game for Proctor and Gamble on Nokia flip phones.

## Adobe

Truthfully, I'm not as experienced in Illustrator as I am in Photoshop. I can make great technical drawings and schematics with it, however, including UML and flow diagrams, etc. I use it sometimes to generate source material and layouts which are later imported into Photoshop. Lately I've been using draw.io since I haven't renewed my license since CS4.



interoperable classes in C/C++ for Visual Studio. My experience includes a wide range of Desktop, Web and Mobile: driver middleware libraries, multithreading, rendering techniques in OpenGL, binary file support, textual file support including writing my own JSON handling classes, extensive support for OpenAL the open audio library.

Beyond the low-level hardware support libraries, I have also spent a great deal of time exploring, implementing and inventing new animation tools, image analysis, procedural rendering, game development tools, level editors and interactivity. Under the shingle "Lost Astronaut Studios", I have in production two green-lit titles on the STEAM platform. I have written 2D gaming engines, 3D object customization editors and modeling programs, combining a variety of techniques exploring many aspects of game design.

Though too numerous to list here, some of the topics have included procedural generation of geometry, color manipulation, particle systems on both the GPU and CPU side, 2D and 3D fonts, in-game dialogue systems, questing systems, level advancement, reward systems, collision systems, and audio APIs.

## Specializations

Skills include: HTML, CSS, PHP, MySQL/MSSQL/Sqlite/PDO, Linux, Windows, C/C++, OpenGL, OpenAL

Javascript libraries: MapboxJS, jQuery, others

Adept at using Photoshop, Illustrator and Open Office, Microsoft Office 2016. Some experience with earlier versions of Adobe Premiere / Digital Video

Other explorations: Compiler development, Morphology Analysis (Image Analysis), Data Processing, Data Analysis/Visualization, Programming Language Design, Tools Development, iPhone/iPad, (OpenGL ES), Processing, Audacity, FLS Pro, Voice Acting, "Special Effects", 3D Engine Development, GLSL

## Production Samples

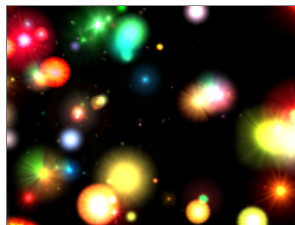
Software development screens and user photographs



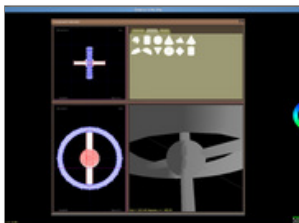
Self-made game engine



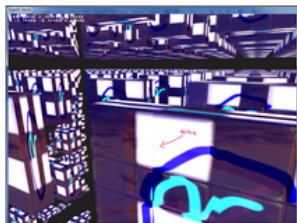
Ganos LLC



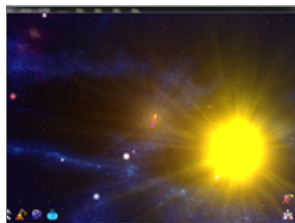
CPU Particles



3d Modeling (libagar)



WorldShader (GLSL)



2.5D engines



Retail Customization UI



Best in Toy Fair 2016



PieceMaker Technologies

## Java



Aside from the fact that I was an early contributor to Processing.org's IDE, I've also rapped with former Yahoo CEO Carol Bartz on the phone about Java's inner workings. Java was invented by an alumnus from my alma mater, Carnegie Mellon. I don't do this much anymore because of various reasons, but I was once a Netbeans developer.

## Quick Code Samples

PHP: CSV Decoder

```
if ( !function_exists('fromcsv') ) {  
function fromcsv($in,$sep=',') {  
$out=explode("\n",$in); foreach ( $out  
as &$line ) $line=explode($sep,$out);  
return $out; } }
```

C/C++: Complex Lerp

```
double mapRanged(double inputValue,  
double inputMin, double inputMax,  
double outputMin, double outputMax) {  
double perc=(inputValue-  
inputMin)/(inputMax-inputMin);  
double outMax=outputMax-outputMin;  
return outputMin+(perc*outMax);}
```

Javascript: Random Array Elements

```
function randele(a) { return  
a[Math.floor(Math.random()*a.length)];  
}  
function seedele(s,a) { return  
a[s%a.length]; }
```



Tomorrow Lab @ TRU



3D Printing Retail



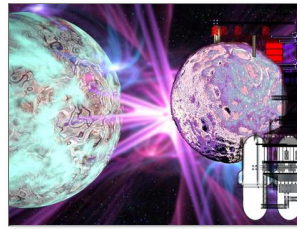
Earlier Version



PieceMaker @ Toys-R-Us



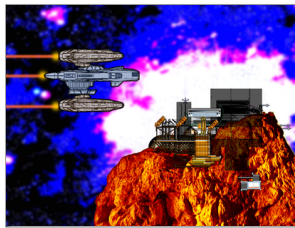
Turtle Power



Greenlit Projects



Team-building



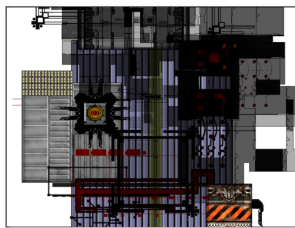
Lost Astronaut . com



Indie Game Dev



Python on Raspbian



2D Artist



@LAGameStudio

## Code Samples and Relevant Links

<https://github.com/LAGameStudio/apolune> will lead you to a 15-year-long C++ and OpenGL game and graphics engine project

<http://github.com/h3rb/> is my personal github; I highlight a closer look at **ZeroTypes** library and **Page Framework** (papi) which demonstrate my depth of knowledge in both C++ and the LAMP stack. For GLSL, view *gml-pro* an extension library for GameMaker growing in popularity. InputCandy, an intense exploration of XInput and DirectInput multi-player controller support for games. I have also recently initiated a new project **Galvanic** that implements a purely C++ web API back-end using MySQL Connector and AWS Cpp SDK

