Gustaf Swansen

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Work Experience

Hardware Architect | Bolt Graphics | Denver, CO
June 2022 – Present

Bolt Graphics is a startup designing a GPU. My responsibilities and accomplishments include the following:

Hardware

- Lead the hardware delivery for the company's first tapeout
- Architecting from 0 to POC, a hardware accelerator for physics simulation
- Signifigant contributer to end to end piplined ray-tracing accelerator IP
- Creating benchmarks and compelling visuals which helped secure two rounds of funding
- Designed an AXI-master used to communicate to HBM which imlemented slow to fast and fast to slow CDC
- Improved the clock rate of our hardware on FPGA from 100MHz to 250MHz through timing analysis and logic optimization
- Evaluating different designs for timing, area, and power
- Developing RTL modules in system verilog to adhere to the IEEE-754 standard
- Bringing up Xilinx Alveo FPGA and remote on Xilinx Virtex Ultrascale+ hosted on AWS
- Verifying designs in simulation through custom testbenches, UVM, and Synopsys' VCS
- Ensuring Designs brought up on FPGA match expected results from simulation
- Implementing DSP algorithms such as DFT and CORDIC

Software

- Creating Python and C++ software models of our hardware
- Built the company's first C++ driver for our hardware
- Responsible for connecting the driver to application level software
- Using linux, custom linux kernels, and docker

FPGA Engineer | Boeing | Albuquerque, NM
June 2020 – May 2022

Boeing Laser & Electro-Optical Systems (LEOS) is a research and development (IRAD) office that develops cutting-edge laser weapon systems. My responsibilities and accomplishments included the following:

Hardware

- Maintaining legacy object-tracking algorithms on Xilinx’s Kintex Ultrascale FPGAs
- Implementing new object-tracking algorithms on FPGA
- Constructing simulation environments using Matlab's Simulink
- Developing RTL in VHDL to control QSFP fiber for chip to chip communication using GTY/GTM
- Translating CameraLink to SpaceWire and other data formats
- Integrated MicroBlaze soft-core processor
- Using an oscilloscope to investigate EMI

Software

- Developing custom C++ drivers for cameras
- Developing software on a System running VxWorks RTOS
- Communicating to gimbals to keep an object in frame

Internship | Invenshure | Minneapolis, MN
May – August & December 2018

Invenshure is a technology incubator which brings early-stage technology to market. I worked for two of their portfolio companies doing software testing and development.

Education

MS | Purdue University | West Lafayette, IN

January 2022 – May 2025

Electrical & Computer Engineering with focus in VLSI
Completed part time while working full time for Boeing and Bolt Graphics

Relevant course work

- MOS VLSI Design
- Integrated Circuit / MEMs Fabrication
- Electronic Packaging and Heterogeneous Integration

BS | Purdue University | West Lafayette, IN

August 2016 – May 2020

Electrical & Computer Engineering

Relevant Skills

System Verilog, C, C++, Python, Git, VHDL, Xilinx/Vivado, UVM, Icarus Verilog, Agile Management, Docker, Cmake, Cadence Virtuoso, Matlab, Simulink, Microcontroller Programming, Microsoft Office, Google Drive