

Guanshujie Fu

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EDUCATIONS

ETH Zürich (ETHz) M.S. in Information Technology and Electrical Engineering-EEIT <ul style="list-style-type: none">Specialized in <i>Computers and Networks</i>	Zürich, Switzerland 2023.09 - Present
University of Illinois, Urbana Champaign (UIUC) B.S. in Computer Engineering-ECE (GPA: 3.85/4.00) <ul style="list-style-type: none">Graduated with <i>High Honors</i>, Dean's List (2020&2021&2022)	Illinois, USA 2019.09 - 2023.06

SKILLS

Programming:

Proficient in *C/C++*, *Go*, *Python*, *Java*, *Assembly*, *SystemVerilog*
Intermediate in *CUDA-C*, *HTML*, *JavaScript*, *RTL*, *P4*, *Haskell*, *MATLAB*.

Frameworks/Tools: *Docker*, *Kubernetes*, *Redis*, *High Level Synthesis*, *Altera Quartus*, *Vitis/Vivado*

Cloud/Database: *AWS*, *GCP*, *Spark*, *Hadoop*, *MySQL*, *Milvus Vector Database*

EXPERIENCES

System Engineer Intern ABB Ltd <i>Software Analysis</i> , <i>LLVM</i> , <i>C++</i> <i>Supervisor: Philip Sommer</i> <ul style="list-style-type: none">Working in Industrial Software System Group, I focus on program analysis using LLVM-based techniques	2023.03 – Present
Backend Engineer Intern Hangzhou HouQi Tech Co. Ltd <i>Kubernetes</i> , <i>Docker</i> , <i>MySQL</i> , <i>Redis</i> , <i>Golang</i> , <i>C++</i> <ul style="list-style-type: none">Developed Golang-based vector operation APIs using Milvus, enabling fast processing of multiple concurrent requestsProvided low-latency vector operations as a micro-service within a larger cloud platform frameworkUsed Redis as intermediate storage in vector search to support low latency ranking algorithm for search resultsDeveloped a <i>RTSP</i> video stream pulling/pushing scheme capable of decoding and converting video data into OpenCV Mat format within 30ms. Integrated with a face detection algorithm for efficient processing	2023.03 - 2023.05
Undergraduate Researcher UIUC <i>Edge Computing</i> , <i>Xilinx FPGA</i> , <i>High Level Synthesis</i> , <i>C++</i> , <i>P4</i> <i>Advisor: Professor Nam Sung Kim</i> <ul style="list-style-type: none">Developed benchmark programs to assess SmartSSD performance across various targeted metrics in computer systemImplemented data encryption/compression algorithm (Run Length Encoding and LZ77) using <i>HLS C++</i> in SmartSSDProvided asynchronous memory page compression mechanism for utilizing SmartSSD as a page cache expanderOffloaded data-intensive database key value filter applications using <i>HLS</i> stream data and <i>C++</i> to SmartSSD	2022.02 - 2023.02
Research Assistantship National University of Singapore <i>DPU</i> , <i>TCP/IP</i> , <i>C++</i> <i>Advisor: Professor Jialin Li</i> <ul style="list-style-type: none">Designed and implemented network application on <i>NVIDIA BlueField-2 DPU</i> with <i>DOCA Flow</i> hardware accelerationExplored the potential of offloading some TCP stack operations from Host operating system to <i>DPU</i> based on <i>DOCA Flow</i> framework, and proposed potential offloading scheme and made presentations to industry R&D group	2022.08 - 2022.11

PROJECTS

Full-Stack Website Development [Repo] UIUC <ul style="list-style-type: none">Worked in a team to develop a full stack website for movie dataset collection and user bias recommendationUsed <i>HTML</i> and <i>JavaScript</i> to construct web pages, <i>Python</i>-based Flask to render web pagesUsed <i>MySQL</i> to manage backend large-scale movie dataset and <i>Google Cloud</i> to deploy website	2022.06 - 2022.08
Unix-like OS Kernel Design [Repo] UIUC <ul style="list-style-type: none">Led a team to design and implement an OS kernel resembling Linux with basic and advanced features in <i>C</i> and <i>Assembly</i>The kernel includes file system, virtual memory, process management & scheduling, interrupts & exceptions and etc.Designed a high-resolution (60fps, 800*600 resolution) graphic user interface with standard VGA capable	2022.03 - 2022.05
CUDA-based Optimization on Convolutional Layer [Repo] UIUC <ul style="list-style-type: none">Parallelized the forward pass of convolution layer with <i>CUDA C/C++</i> to run it efficiently on GPUUsed optimization methods including Matrix Unrolling, Kernel Fusion and ReductionUsed <i>NVIDIA Nsight Systems</i> to analyze and optimize	2021.09 - 2021.12
FPGA-based Graphic Design [Repo] UIUC <ul style="list-style-type: none">Developed an <i>FPGA-based</i> version of video game using <i>SystemVerilog</i> along with SoC, capable of processing and outputting complex graphics (60fps, 640*480 resolution) to VGA in a high frame rate and enabling keyboard controlUsed a <i>NIOS II SOC</i> to run the software game loop FPGA and communicate to the graphics system through the <i>Avalon Bus</i>Designed a complex finite state machine (FSM) on the FPGA board to optimize user interaction and collision detection	2021.09 - 2021.12

Advisor: Professor Hongwei Wang

- Designed a framework in *Python* to extract bidirectional relations through a novel combination of reports preprocessing, *BERT* model and *Bi-LSTM-CRF* model
- Enabled the framework to construct diesel engine maintenance knowledge graph based on data set collected from power plants, automatically extract key information from the unstructured text in maintenance reports, transfer the extracted results into a structured knowledge graph using *Neo4j*, and construct bidirectional relations in the graph using *Protégé*

PUBLICATION

Jin Y., **Fu G.**, Qian L., Liu H., Wang H. “Representation and Extraction of Diesel Engine Maintenance Knowledge Graph with Bidirectional Relations Based on BERT and Bi-LSTM-CRF Model”, in 2021 IEEE International Conference on e-Business Engineering (ICEBE 2021), pp 126-133, Nov. 2021. [[Paper](#)]