Yuhao Xie

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EDUCATIONS

University of Florida, FL, US *08 /2021-present*

Master of Electric and Computer Engineering GPA: 3.1/4.0

Hangzhou Dianzi University, Hangzhou, China *09/2017-06/2021*

Bachelor of Engineering, Electronic and Information Engineering GPA: 3.78/5.0, Ranking 15/250

COURSEWORK & SKILLS

- ■ **Curriculum Highlights**
- ● Computer Architecture, Machine Learning, Reconfigurable Computing, Linux Kernel Programming, C Language Fundamentals, Optimal and Robust Control, Data Structures and Algorithms, Signal Processing.
- ■ **Software Operation**
- ● Programming in C++/C, Python, Visual Basic, Java, JavaScript API, C#, Asp.net.
- ● Database Modeling with ERD, Normalization, Access, Oracle, SQL, PL/SQL, SQL server.
- ● System Analysis with SDLC, Scrum, Activity Diagram, Use Case Diagram and Description, Sequence Diagram.

RESEARCH EXPERIENCES

Full-time Research Assistant *5/2022 – present*

Supervisor: Xuan Wang

Investigation of the algorithm about multi-robot system

Step One:

- ■ **Estimate the efficiency of the given algorithm (DDDG)**
- ● Writing Python code of DDDG (Distributed Differentiable Dynamic Game) algorithm to simulate.
- ● Implementing the DDDG to solve a dynamic game among 4 robots for formation initialization.
- ● Using matplotlib api to visualize the mismatch between the results of DDDG and the exact Nash equilibrium of the game. (ongoing)

Part-time Research Assistant

Supervisor: Herman Lam

Investigation of the Energy Consumption of CPUs with Different Clock Frequencies and L1, L2, L3 Cache Settings of ARM Instructions when Executing C Binary Files

Step One:

- **L3 Cache Addition and Configuration**

- Downloaded and installed Gem5 related environments and dependencies and utilized official scripts for self-testing to ensure the availability of the basic environment.

- Added and modified files related to L3 regarding CPU bus interface definition, cache configuration, system call, and CPU configuration.

- Added several parameters concerning cache size, access delay, addressing registers, and the number of buffers to the L3 cache, and cascaded the L1, L2, and L3 caches.

Step Two:

- **Part A: M5 Path Setting and CPU Power Consumption Calculation**
- M5 Path

  - Verified the M5 path through the demo to ensure the correctness of the file path included in the system environment variables.

- CPU Energy Consumption Calculation

  - Utilized fs (full system) to simulate the entire computing environment to obtain more accurate CPU energy consumption.

  - Modified the image name to ensure that the CPU was simulated in the specified Ubuntu system environment.

  - Modified the data export parameters of the system power model (fs_power) and tested the simulation of fs_bigLITTLE through telnet.

- **Part B: Mirror Benchmark Addition and Data Analysis**
- Chosen the official Gem5 ARM binary test file Bubblesort as the benchmark for testing.

- Exported the computer energy consumption data through fs_power and analyzed the data by employing Excel's line chart.

Step Three:

- **Conclusions**
- Model the CPU using the MinorCPU model provided by the Gem5 emulator and extend it to Gem5 for ARM.

- The energy consumption of the CPU under different clock frequencies and combinations of L1, L2, L3 cache sizes and other parameters at 1GHz-4GHz is compared.

- It is concluded that when the L1, L2, and L3 cache sizes are the same, the frequency of the CPU is positively correlated with the energy consumption. When the CPU frequency remains unchanged, the energy consumption first decreases and then increases with the increase of L1, L2, and L3.

Part-time Research Assistant *01/2020 – 07/2020*

Supervisor: Wei Wang

Investigation of Liquid Concentration Indicator

Step One:

■ **Density Access and Trace Point Display**

- Concentration Reading and Storage

  ➢ Added the specified concentration conversion formula to the existing flow totalizer to obtain the liquid concentration value and stored the concentration value in the ROM to realize the subsequent call of the historical record.

- Plot Function

  ➢ Lit the point by setting the corresponding row and column position in the RAM to 1.

Step Two:

■ **Part A: Curve Trend Classification**

- Obtained the corresponding curve of the concentration value by displaying the historical point and current point coordinate information.

- Divided into five categories (rapid increase, slow increase, rapid decrease, slow decrease, and constant amplitude) according to the derivative of the curve at the instantaneous moment.

■ **Part B: Continuous Curve Display and Complimentary Points**

- Continuous Curve Display and Problem Analysis

  ➢ Defined the change of each point in the X-axis direction of the LCD screen as an AD sampling and set the X-axis of the curve equivalent to the actual time axis to reflect the characteristics of the measured object.

- Curve Fill Point

  ➢ Selected two categories with higher gradients, rapid increase, and rapid decrease after being divided into five categories.

  ➢ Guaranteed the continuity of the concentration curve by filling the discrete values of AD sampling in continuous time.

Step Three:

- ◼ **Conclusions**

- Write the program into the single-chip microcomputer, power on the single-chip computer, and input the corresponding concentration electrical signal, so that the liquid crystal screen displays the current concentration value and draws the historical curve.

Part-time Research Assistant   *1/2021 – 5/2021*

Supervisor: JiuCai Lai

Investigation on Open-source Code Grbl Porting based on Atmega328p Platform to Stm32f407 Platform

Step One:

- ◼ **Timer Control**

- Utilized the 16-bit general-purpose timers 3 and 4 of STM32 as timers and set the initial values of timer 3 and timer 4 to realize the control of motor speed and delay time in the original grbl program.

- Selected 50MHz as the initial value of the timer by setting the initial value of GPIO pins, IO speed and IO mode in the interrupt.

Step Two:

- ◼ **IO Porting and Serial Port Initialization**

- IO Porting

  - ➢ Completed the setting of X, Y, and Z directions and the step size of moving in different directions by modifying the grbl pin mapping file to avoid the problem of pin conflict.

- Serial Port Initialization

  - ➢ Completed the serial port initialization by modifying the IO pin data in the serial port initialization function.

Step Three:

- ◼ **Conclusions**

- The grbl was successfully transplanted to the stm32f407. By connecting the XYZ axis and the IO port of the laser pulse to the stepper driver of the laser engraving machine, a more precise engraving result was finally achieved than the original Arduino platform.

OUTSTANDING EXPERIENCES

Hangzhou HIKVISION Digital Technology Co. Ltd.   *08/2019-09/2019*

Intern

- Modelled each electronic product according to its size through CorelDraw.

- Utilized Office software to sort out various data and summed up to obtain rules from the product packaging process.

- Sorted out the packaging data by employing C+ to obtain the corresponding formula of packaging and component size.

HONORS & AWARDS

Provincial Third Prize in the National Computer Programming Design Competition of College Students	*2019*
Qingshan Lake Science and Technology City Cup Excellence Award	*2019*
First-class Academic Scholarship, Hangzhou Dianzi University (one academic year)	*2017*
Second-class Academic Scholarship, Hangzhou Dianzi University (two academic years)	*2018/19*
Third-class Academic Scholarship, Hangzhou Dianzi University (one academic year)	*2020*