

Project Title:

Native Graphics Backend for FreeType Demos on macOS

Size:

350h project

Applicant Name:

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Abstract:

Currently, to run FreeType's graphics demos on macOS, users need to install XQuartz, which relies on the older X11 system. This project aims to remove this requirement by creating a native graphics system for macOS. This new system will handle opening windows, showing pictures, and responding to keyboard presses just like it does in Windows and other systems.

Problem Statement:

The reliance on XQuartz for running FreeType demos on macOS introduces unnecessary complexity and limits the accessibility of the demos. Native support would streamline development and usage, improving the experience for macOS users.

Proposed Solution:

I plan to build a new graphics system for macOS using Swift with Cocoa for managing windows and Quartz for drawing. This system will:

- Basic windows opening
- Display flat bitmaps
- Respond to keyboard inputs

Implementation Plan:

Phase 1: Research and Planning (Week 1-2):

- Study the current FreeType demo implementations on other platforms.
- Design a basic architecture for the macOS backend.

Phase 2: Backend Development (Week 3-7):

- Develop the core functionalities: window creation, bitmap display, and keyboard event handling.
- Integrate the backend with a simple FreeType demo to test functionality.

Phase 3: Integration and Testing (Week 8-10):

- Add the new system to more complex demos.
- Test everything to make sure it works well.

Phase 4: Optimization and Documentation (Week 11-12):

- Document the implementation process and usage guidelines.

Timeline:

- Week 1-2: Research and Planning
- Week 3-7: Backend Development
- Week 8-10: Integration and Testing
- Week 11-12: Documentation

Experience and Background:

I am a junior Computer Engineering student at Istanbul Sabahattin Zaim University, with a strong background in web development, programming, and open-source contribution. My prior experiences include:

- Contributing significantly to FreeType's benchmarking code integration last year, my extensive familiarity with the project's codebase, makefiles, and structure positions me uniquely to carry this optimization forward. [1]
- Successfully developed a donation automation system for NetBSD (at the same time with FreeType's project) "Continuing the Automation: Automating Donor Acknowledgement and Information Storage & Updating". It wasn't accepted officially as part of GSoC, however NetBSD board recognized my dedication and accepted me for outside support to work on their project. The donation automation system depend on Python (Flask) and PostgreSQL which successfully streamlined the contribution process. Worked closely with my mentor, Christos Zoulas. [2]
- I am working at BSH (formerly Bosch-Siemens Hausgerate) Solutions Architecture Intern (until June 2024) field which is working in agile/scrum development methodologies. I got experience here to set CI/CD pipelines through GitHub actions, Containerization, Log Management and API Management.
- Developed an emergency services application for Android and web, which earned me 1st place in coding by TÜBİTAK (The Scientific and Technological Research Council of Turkey), the most prestigious award for high school students in Turkey. [3]
- Serving as the president of the Blockchain Club at my university and managing a blockchain payment system project for our campus.
- Huge diversity of interest in CS spanning HAM radio and havin radio amateur licence to cybersecurity and receiving awards from companies for reporting vulnerabilities in their systems.

[1]: <https://gitlab.freedesktop.org/freetype/freetype/-/tree/gsoc-2023-ahmet-final>

[2]: <https://github.com/goeksu/NetBSD-Donation-Automation>

[3]: <https://github.com/goeksu/Conserva>

Why This Project:

This project aligns with my skills in macOS development and my interest in enhancing software usability on different platforms. Implementing a native backend for FreeType demos on macOS will contribute significantly to the FreeType community, providing a more streamlined and user-friendly experience for macOS users.

Availability:

I am fully committed to dedicating my summer to this project, ensuring its completion within the stipulated timeframe. My primary focus will be on delivering a robust solution that meets the project's needs and expectations.

Conclusion:

Building on my contributions from the previous year, this project aims to solidify FreeType's benchmarking framework, ensuring it provides consistent and reliable performance measurements. Through targeted optimizations and leveraging my deep project knowledge, I look forward to contributing to FreeType's ongoing enhancement and reliability.