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CMSC 636 : Data Visualization, Dr. Jian Chen
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Assignment 1: Visualization Construction

"Vulkan is a new generation graphics and compute API that provides high-efficiency, cross-platform access to modern GPUs used in a wide variety of devices from PCs and consoles to mobile phones and embedded platforms."

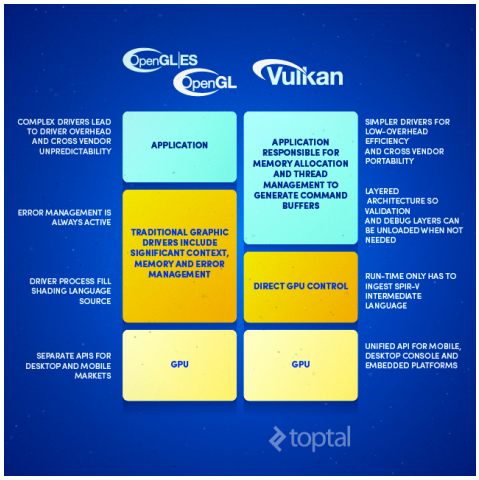
Introduction

The Vulkan 1.0 specification was released by the Khronos Group on February 16th, 2016. The Vulkan specification, along with the drivers and SDKs was launched as a next generation GPU API successor to OpenGL. It is somewhat inspired by the AMD Mantle API.

A brief history

OpenGL
OpenGL® is the most widely adopted 2D and 3D graphics API in the industry, bringing thousands of applications to a wide variety of computer platforms. It is window-system and operating-system independent as well as network-transparent. OpenGL enables developers of software for PC, workstation, and supercomputing hardware to create high-performance, visually

compelling graphics software applications, in markets such as CAD, content creation, energy, entertainment, game development, manufacturing, medical, and virtual reality. OpenGL exposes all the features of the latest graphics hardware.



OpenGL ES

OpenGL® ES is a royalty-free, cross-platform API for full-function 2D and 3D graphics on embedded systems - including consoles, phones, appliances and vehicles. It consists of well-defined subsets of desktop OpenGL, creating a flexible and powerful low-level interface between software and graphics acceleration.

Vulkan

Vulkan is the new generation, open standard API for high-efficiency access to graphics and compute on modern GPUs. This ground-up design, previously referred to as the Next Generation OpenGL Initiative, provides applications direct control over GPU acceleration for maximized performance and predictability.

Vulkan vs OpenGL/OpenGL ES

- Vulkan is built to be platform agnostic from the ground up. Vulkan runs on desktop, mobile, gaming consoles, wearables, cars etc. without much porting.
- The Vulkan API is more low-level than OpenGL. It is closer to the bare metal GPU giving more flexibility to developers.
- The Vulkan API has a higher operational setup complexity because of it being more low level.
- API choices can be complex for OpenGL as syntax evolved over 20 years. Vulcan simplifies API design and specification size.
- Thread allocation and memory management are left to the application in Vulkan. This means more work for the developers but finer control and fewer surprises.
- Vulcan is still in a technical preview state and will take time to mature. OpenGL is an industry stalwart with great documentation and toting support available.

Vulkan for Android

The Android platform includes an Android-specific implementation of the Vulkan API specification. It provides tools for creating high-quality, real-time graphics in applications. Vulkan also provides advantages such as reducing CPU overhead. Vulkan is on the path to becoming the standard GPU API on Android as Apple released the Metal API in iOS 8.

Introduction

Tableau is a data visualization software. It allows you to easily import data from various sources and create spectacular visualizations with ease. You can then save your visualizations to the cloud, share them on social media or embed them in your website, blogs etc.

Flavors

Tableau comes in a variety of forms.

Tableau Desktop

Tableau Desktop runs on Windows and Mac. You can download the installer and run it locally on your machine.

Tableau Online

Tableau Online is the hosted version of Tableau Server. You can sign in to your account from anywhere and use Tableau via the desktop or mobile app.

Tableau Server

Tableau Server is for organizations who want higher security over their data and also customizations. Tableau Server is deployed on premise.

Tableau Public

Tableau Desktop runs on Windows and Mac. You can download the installer and run it locally on your machine. All your visualizations are public and is a great tool for discovering and learning about Tableau.

Overview

Tableau Desktop is available for free to students. Tableau lets you run ad hoc as well as scheduled queries against a variety of data sources. Tableau is a business intelligence tools that helps analysts make better business decisions everyday. Tableau requires no coding or computer science know-how to get started with.

Features

Some of Tableau's salient features include,

- Data types supported by Tableau are strings, numbers, booleans, geo coordinates and date and times.
- Tableau lets you to connect to all the popular SQL and NoSQL data stores like Hadoop, MySQL etc. or simple flat files like cvs and xls. You can also connect to CRMs like SalesForce and SAP.
- You can create a myriad of charts, graphs, maps and histograms like line, bar, bubble, tree etc.
- Tableau is very beautiful by design and makes for creating stunning visualization dashboards.
- Tableau lets you do data formatting, forecasting and trend analysis with ease.
- It also lets you do sorting, filtering and aggregation over your data.