

Functional programming vs. Efficient Computer Graphics

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We provide an overview of the Aardvark Platform team and current interesting projects. The team works in High Performance Rendering, Data Acquisition and Computer Vision areas together with industry partners, aiming to create clean, production-quality software. Functional Programming and Declarative APIs greatly facilitate this process for small and scientific teams.

Aardvark Platform is an open source rendering and visual computing library powering multiple state of the art industry applications. The core component Aardvark.Rendering is a lazy incremental renderer which compiles render commands down to efficient GPU instructions using a dependency tracking system. An adaptive scenegraph provides a declarative scene specification API. We walk through the implementation of such a rendering backend and demonstrate difficult use cases handled quickly and concisely.

FShade is a library for composable shaders. Using a declarative language, shader modules are defined independently and then compiled efficiently into a shader pipeline, which is then emitted as shader code. Features:

- easy shader variation and reordering
- automatic VR shaders
- shader caching through expression tree serialization
- live shader editor