




1 Augmented Reality UNIX C++ Engine for Enhanced 2 Visual Guidance in Woodworking

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Software

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6 Summary

7 Statement of need

8 Functionalities

9 Layer-stack flow

10 The layer stack is primarily responsible for managing the flow control of the AR engine.
11 Designed as a modular system, each layer encapsulates the code for a specific domain of the
12 AR application, such as camera processing, object tracking, UI, and rendering. The general
13 order and expansion of these layers can be configured in the top-level main file `ACApp.cpp`.

14 Each layer in the stack inherits from a superclass interface defined in `Layer.h`, which includes
15 event-like methods triggered at various points during frame processing (e.g., `OnFrameAwake()`,
16 `OnFrameStart()`, etc). These methods are invoked by the main `Run()` function in the sin-
17 gleton application loop from `Application.h`. This design allows application tasks to be
18 containerized and executed sequentially while facilitating data exchange between specific layers
19 through the `AIAC_APP` macro, enabling the retrieval of any particular layer data. Exchange
20 between layers can also take place in a more structured way with the integrated event system
21 (`ApplicationEvent.h`), which is capable of queuing events from layers and trigger them in
22 the next main loop.

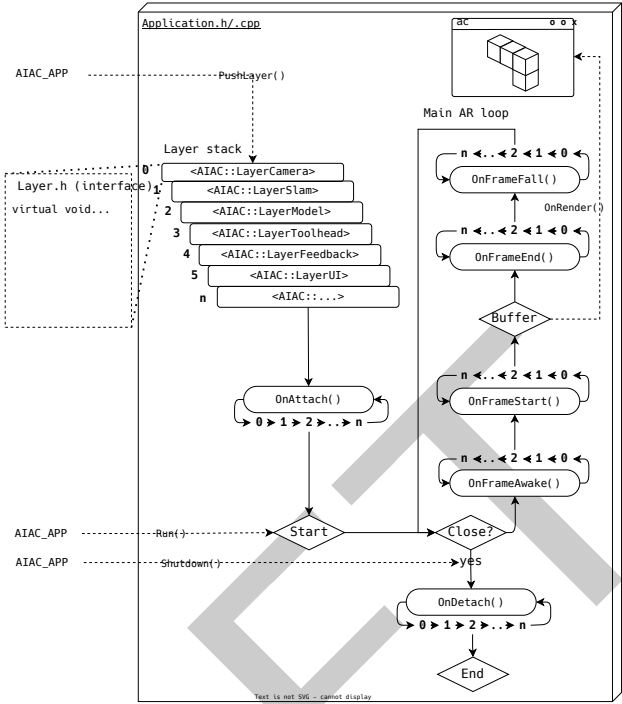


Figure 1: Illustration of the layer-stack design and the main loop for the AR engine.

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Geometry framework

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Computed Feedback System

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AR rendering

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Acknowledgements

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References