

# Agent System with C++ Actor Framework

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AGS3, 2020-01-23

# C++ Actor Framework (CAF)

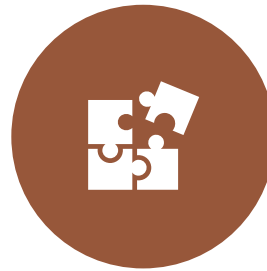
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INSPIRED BY ACCA



IMPLIES FUNCTIONAL-  
LIKE PROGRAMMING  
PARADIGM



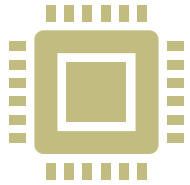
HEAVILY RELIES ON  
TEMPLATE  
METAPROGRAMMING



BASED ON C++17

# CAF Challenges

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**Unusual programming model for  
C++**



**Hard-to-understand source code**

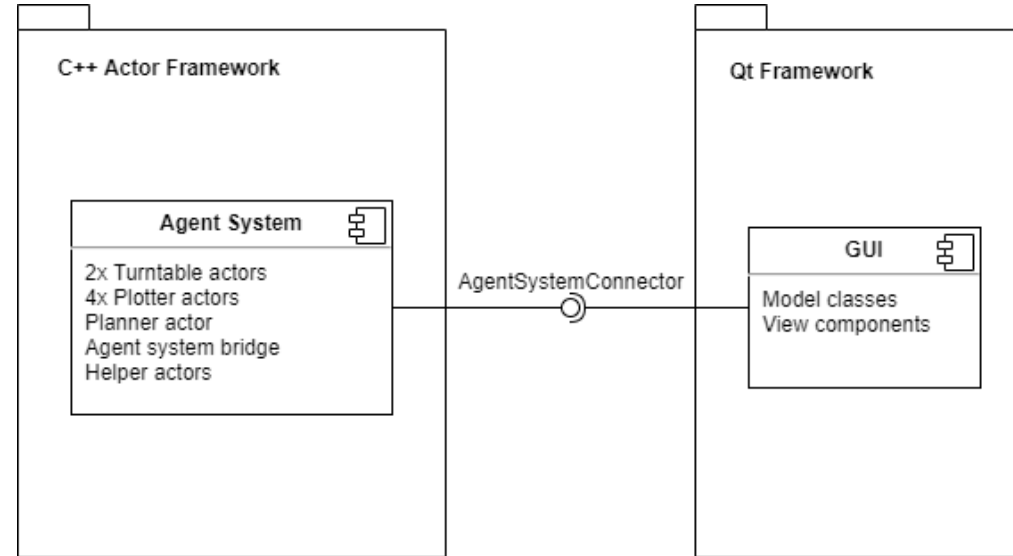


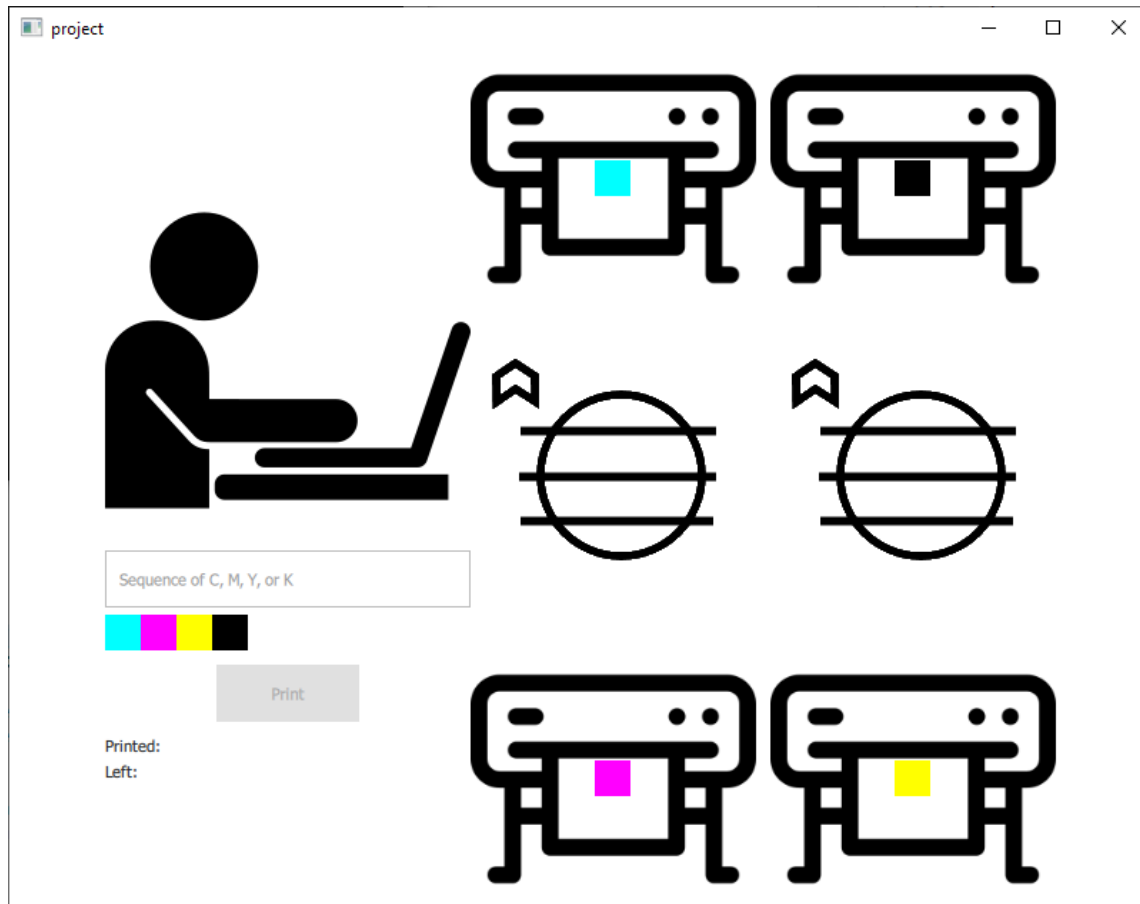
**Almost no additional information  
on the Internet**

StackOverflow, github, google...

# Agent System with CAF: Big Picture

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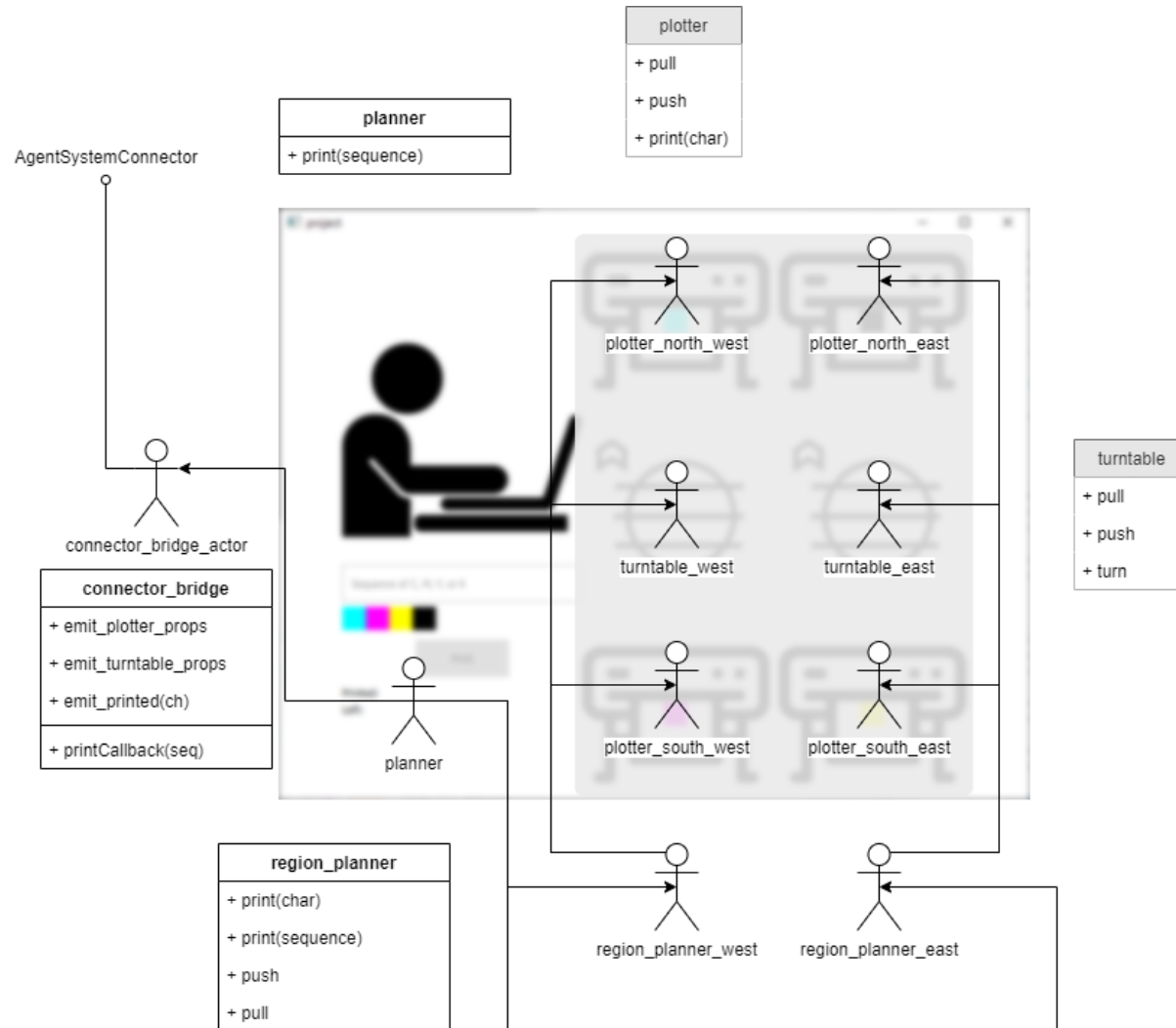


# GUI

Qt/QML Application

Model classes: Plotter, Turntable, Laptop

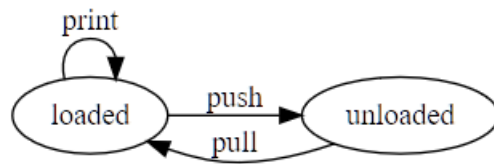
Actor system sends the states via  
AgentSystemConnector



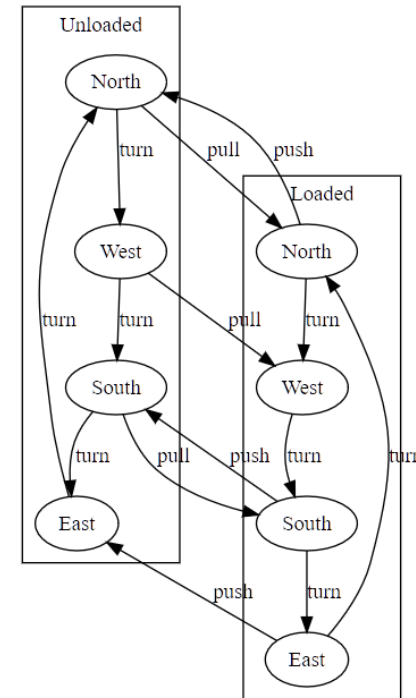
# Actor System

# Actors as State Machines

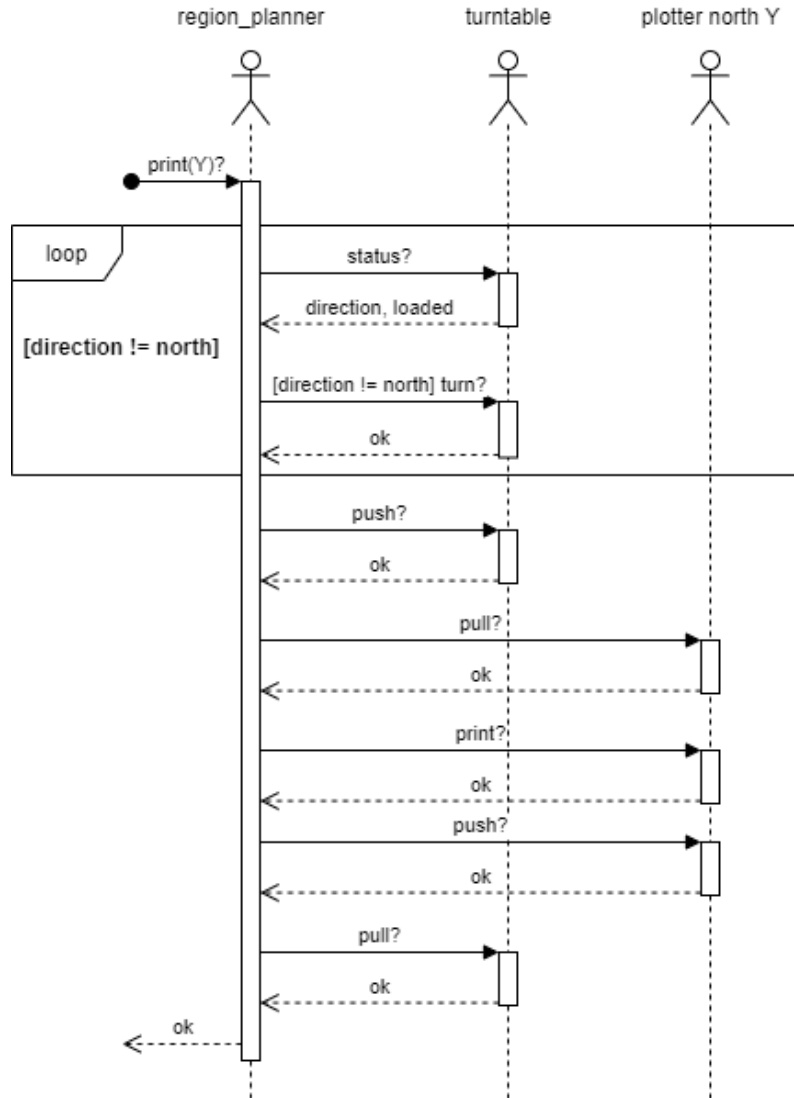
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Plotter



Turntable



# Actor Communication

Global planner commands the regional planner to print yellow

Regional planner knows which colors plotters have

Turntable turns until it faces north

Push/pull sequence as handshake



01

Static type checking:  
in some cases  
sending an unknown  
message can be  
detected in compile-  
time

02

Better promise and  
future  
implementation, as  
opposed to the  
Standard C++ Library

03

Thread data  
synchronization is  
handled by the  
library

## CAF Advantages

# CAF Disadvantages

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VERY STEEP LEARNING CURVE



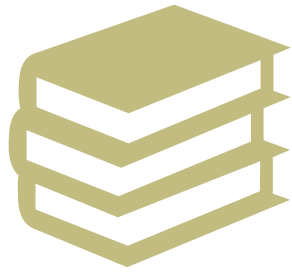
THE LIBRARY CAN BE HARDLY  
INTEGRATED WITH SOMETHING  
ELSE



SOLID C++ KNOWLEDGE  
REQUIRED

# Lessons Learned

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**Better evaluation of libraries w.r.t.  
project objectives**



**Qt Framework might be a better choice  
for an application with actor system**

Not an actor model per se but has similar properties

Easy to learn and use

PhD in C++ not required