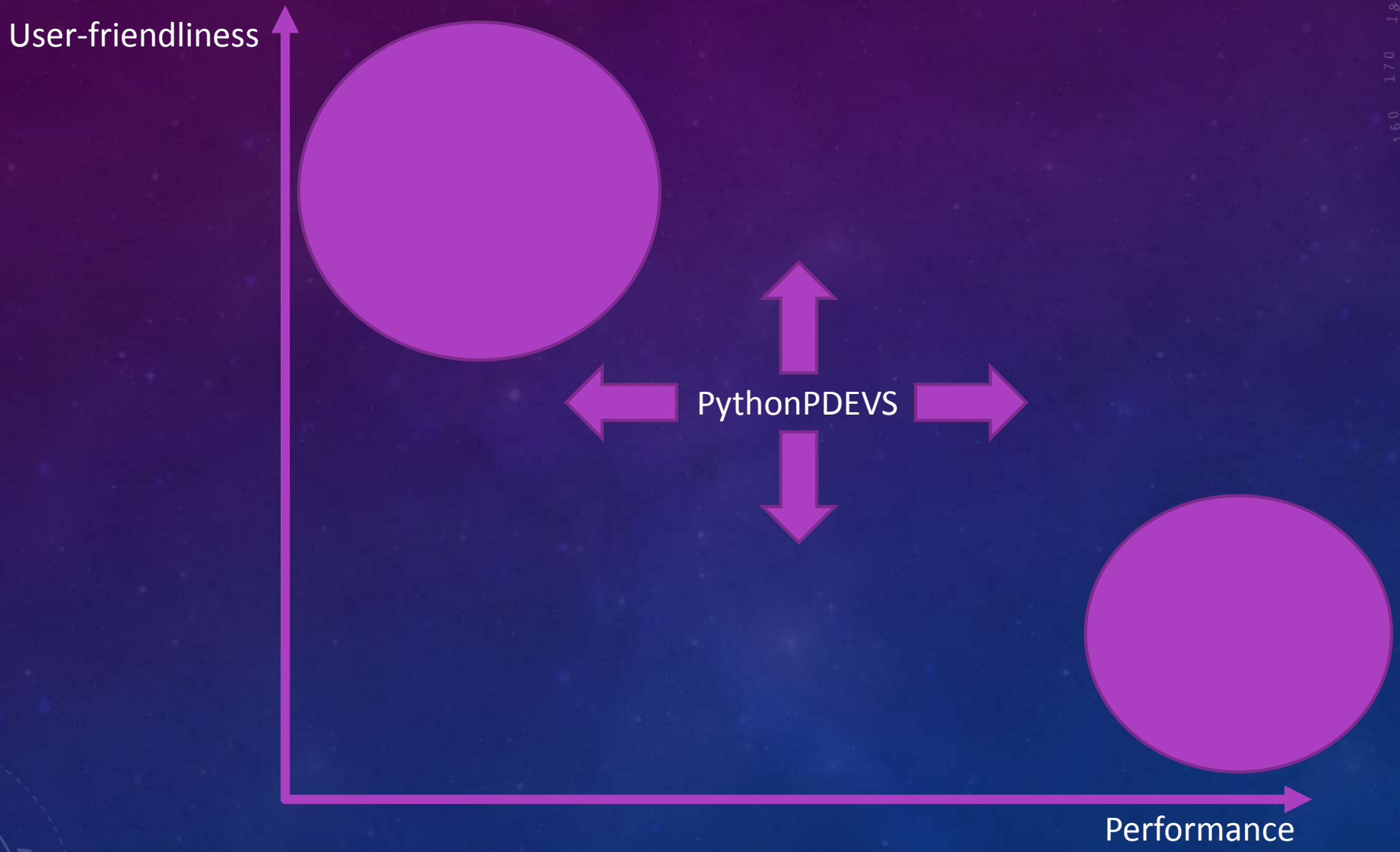
AN OVERVIEW OF PYTHONPDEVS

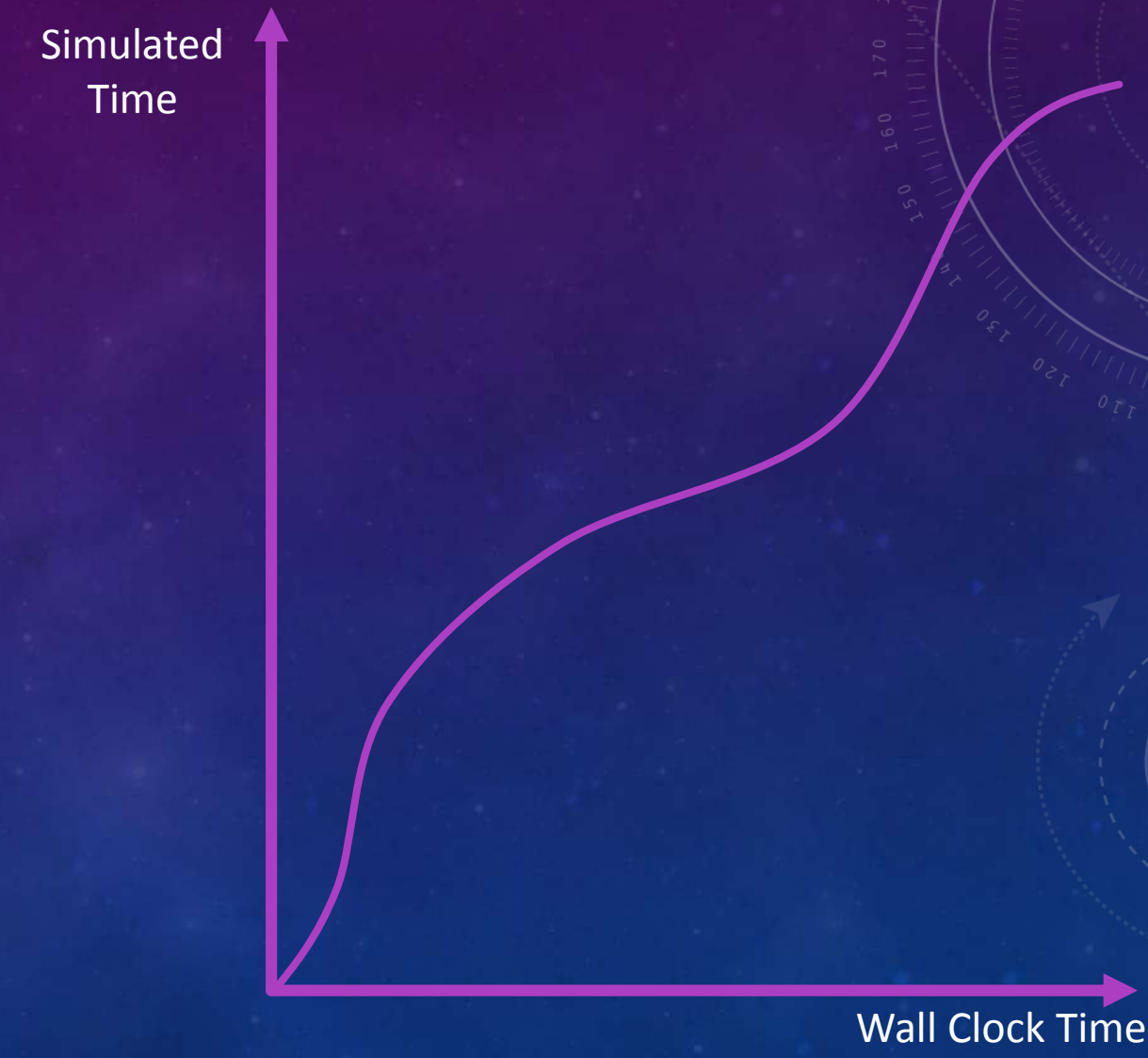
YENTL VAN TENDELOO AND HANS VANGHELUWE

MS4 Me DEVS-Suite X-S-Y CD++ PowerDEVS VLE Adevs

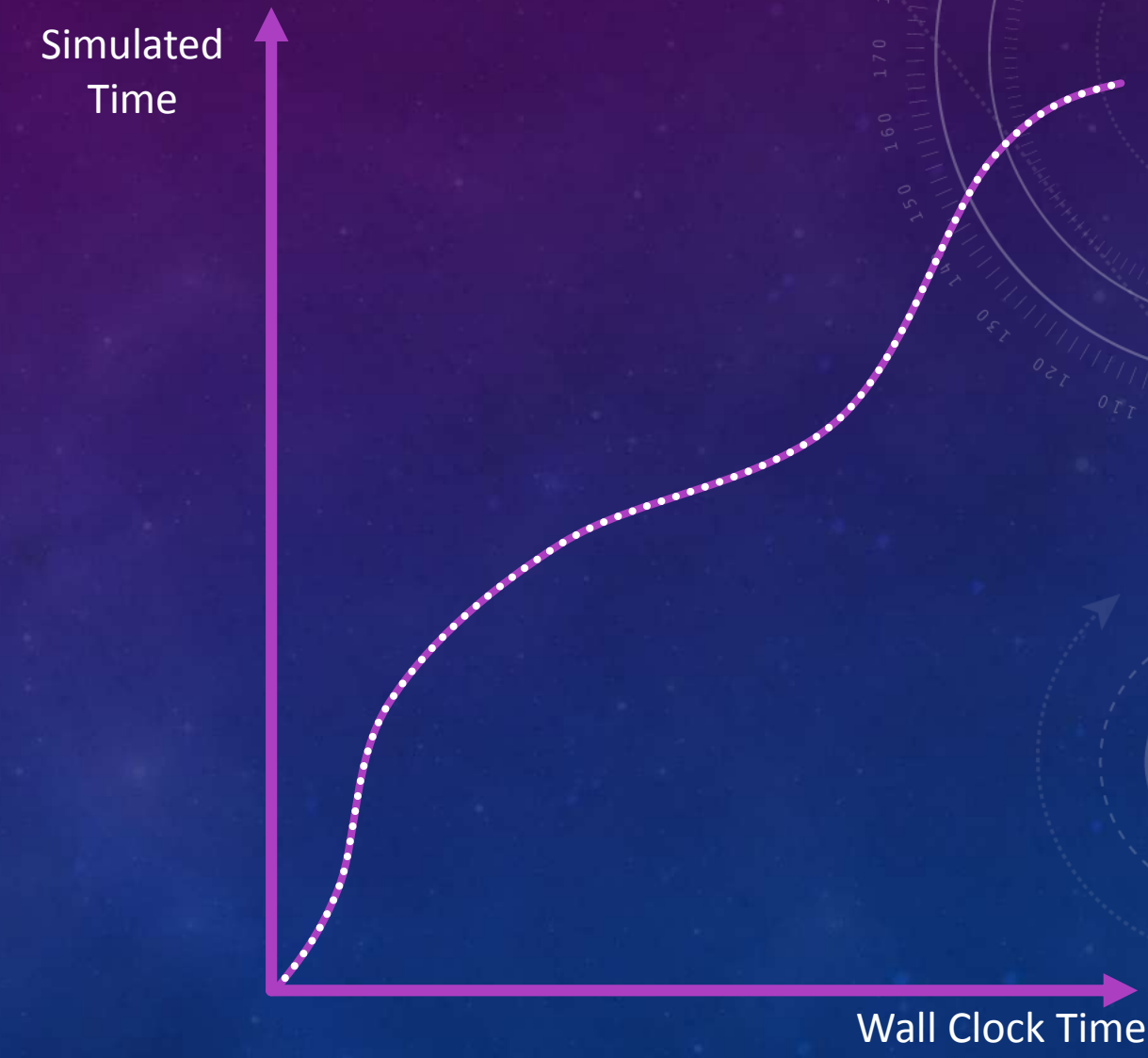


```
from pypdevs.DEVS import *

class TrafficLightAutonomous(AtomicDEVS):
    def __init__(self):
        AtomicDEVS.__init__(self, “Light”)
        self.state = “green”
        self.observe = self.addOutPort(“observer”)
        self.interrupt = self.addInPort(“interrupt”)

    def intTransition(self):
        state = self.state
        return {“red”: “green”,
                “yellow”: “red”,
                “green”: “yellow”}[state]

    def timeAdvance(self):
        state = self.state
        return {“red”: 60,
                “yellow”: 3,
                “green”: 57}[state]

    def extTransition(self, inputs):
        inp =
inputs[self.interrupt][0]
        if inp == “manual”:
            return “manual”
        elif inp == “auto”:
            if self.state == “manual”:
                return “red”

    def outputFnc(self):
        state = self.state
        if state == “red”:
            v = “green”
        elif state == “yellow”:
            v = “red”
        elif state == “green”:
            v = “yellow”
        return {self.observe: [v]}
```

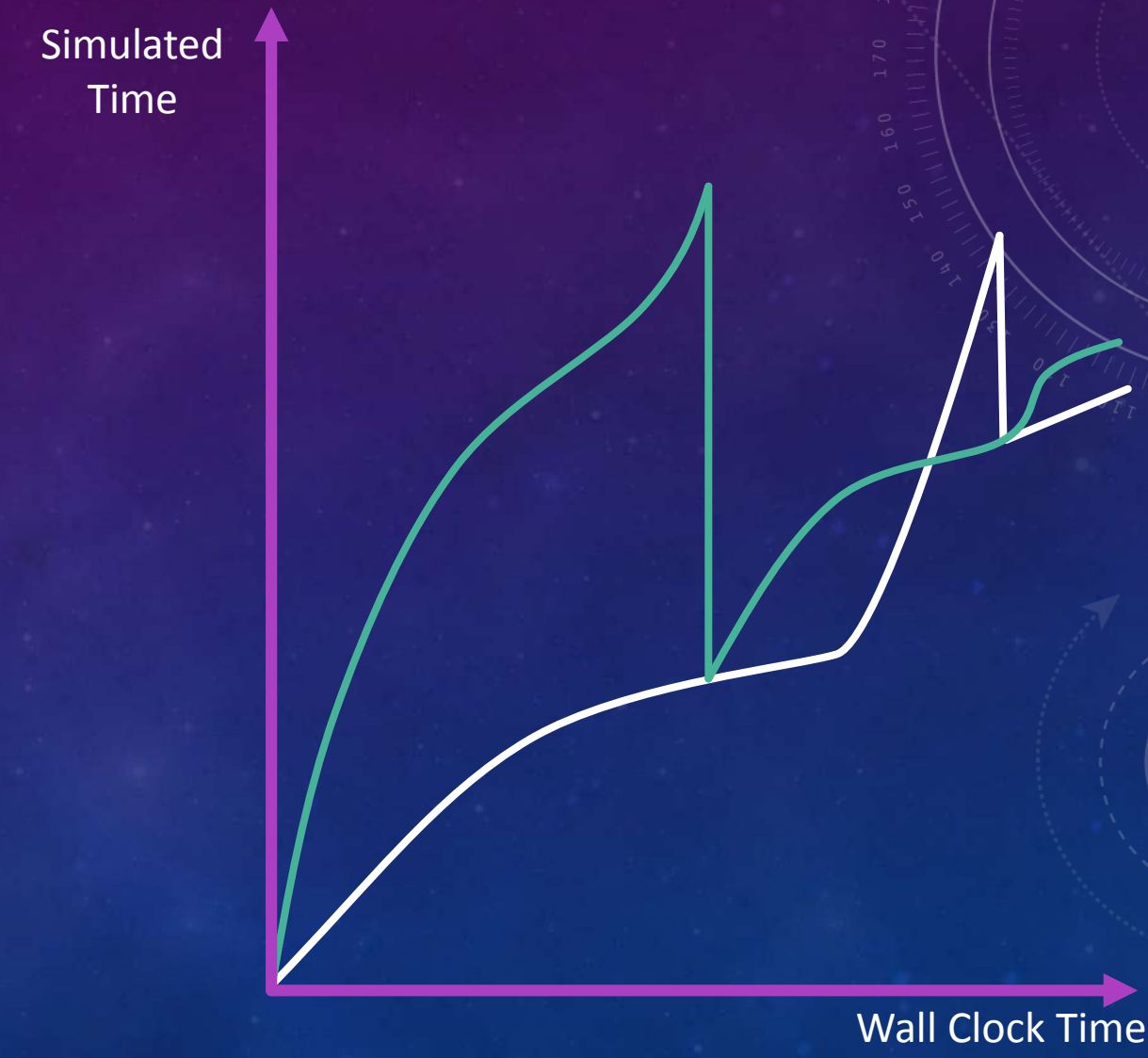
Execution modes	As-fast-as-possible
Sequential	✓



Execution modes	As-fast-as-possible
Sequential	✓
Parallel	✗

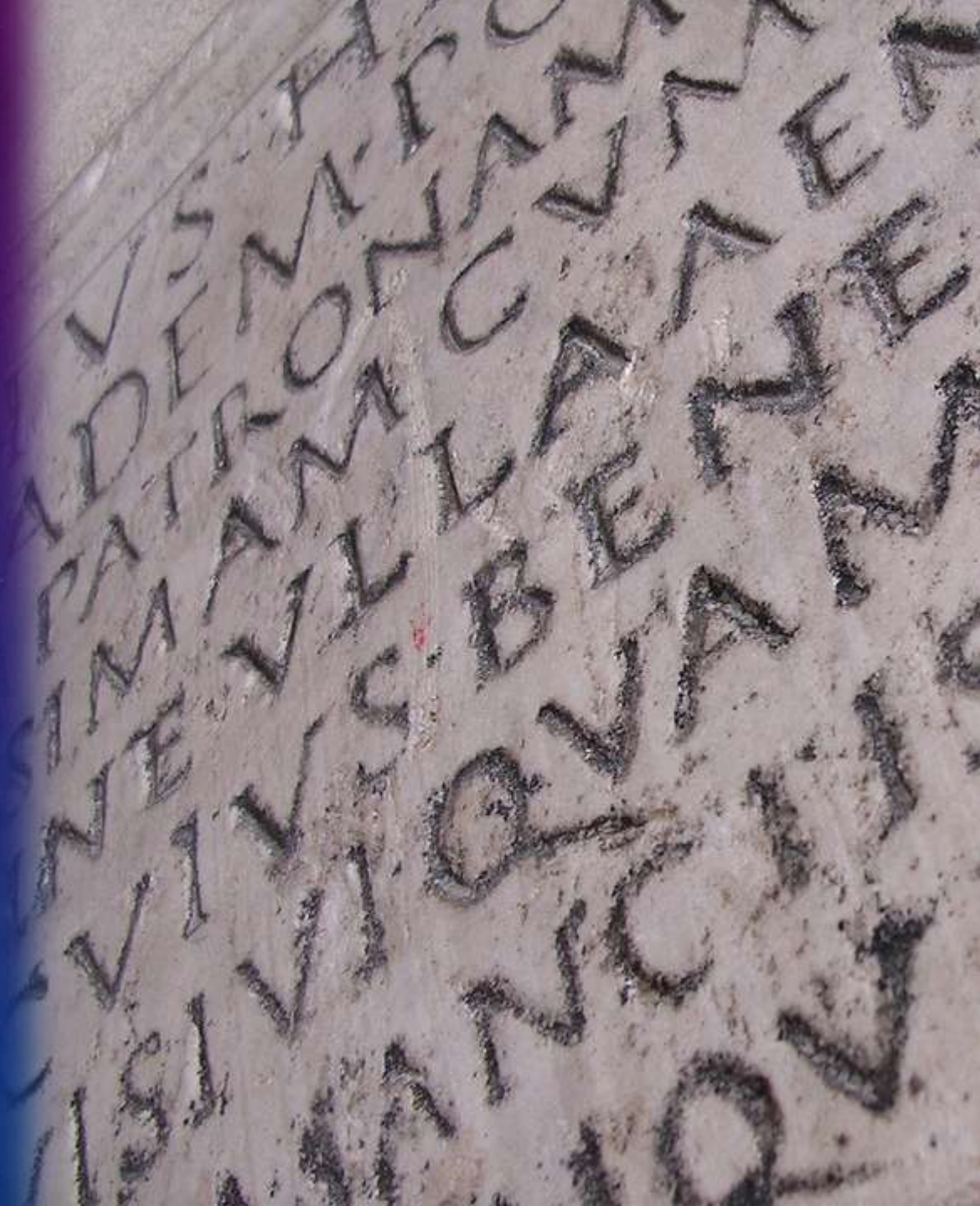


Execution modes	As-fast-as-possible
Sequential	✓
Parallel	✗
Distributed	✓

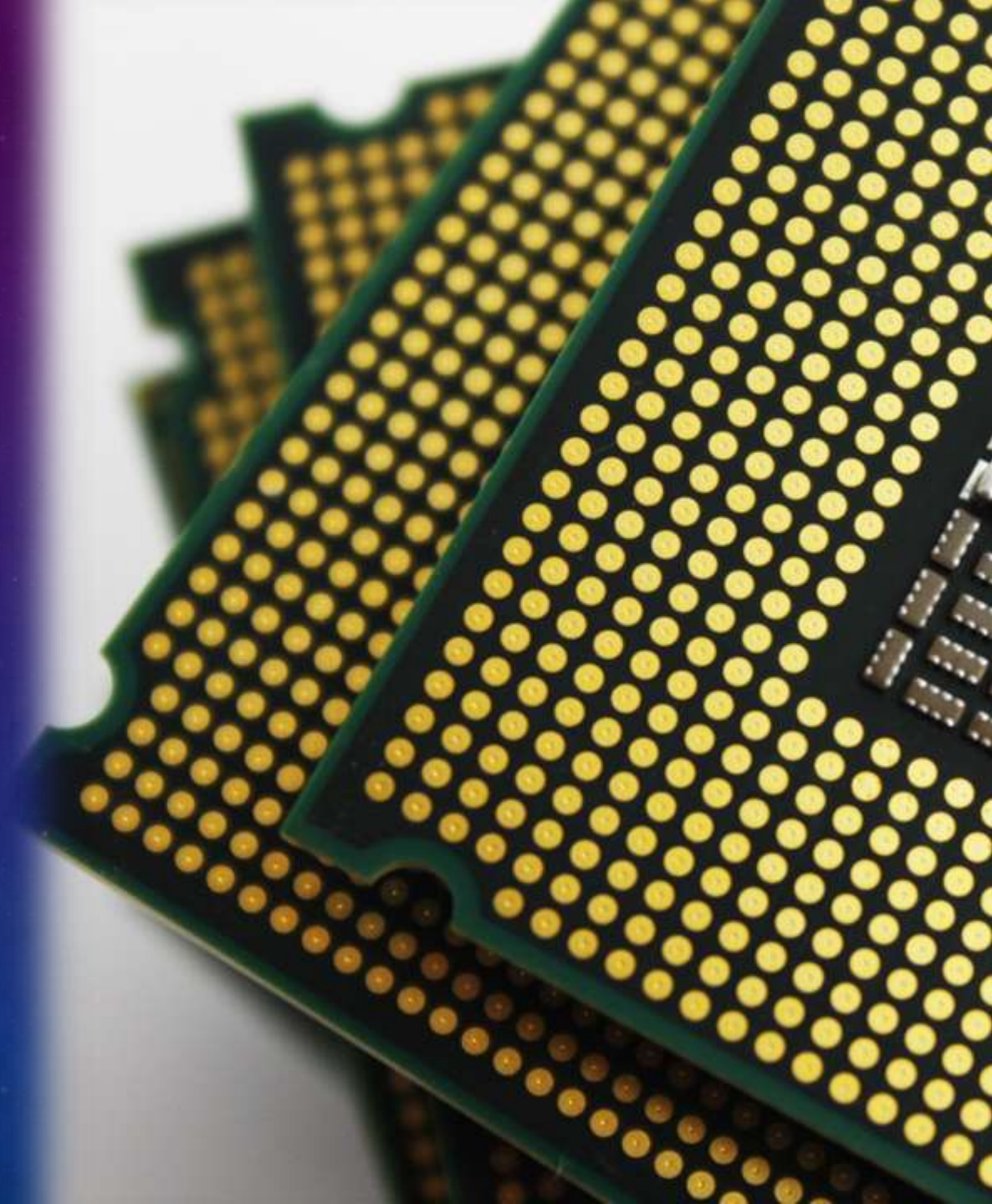


Execution modes	As-fast-as-possible	Realtime
Sequential	✓	✓
Parallel	✗	✗
Distributed	✓	✗

Features	Sequential AFAP	Sequential RT	Distributed AFAP
Classic DEVS	✓	✓	✗

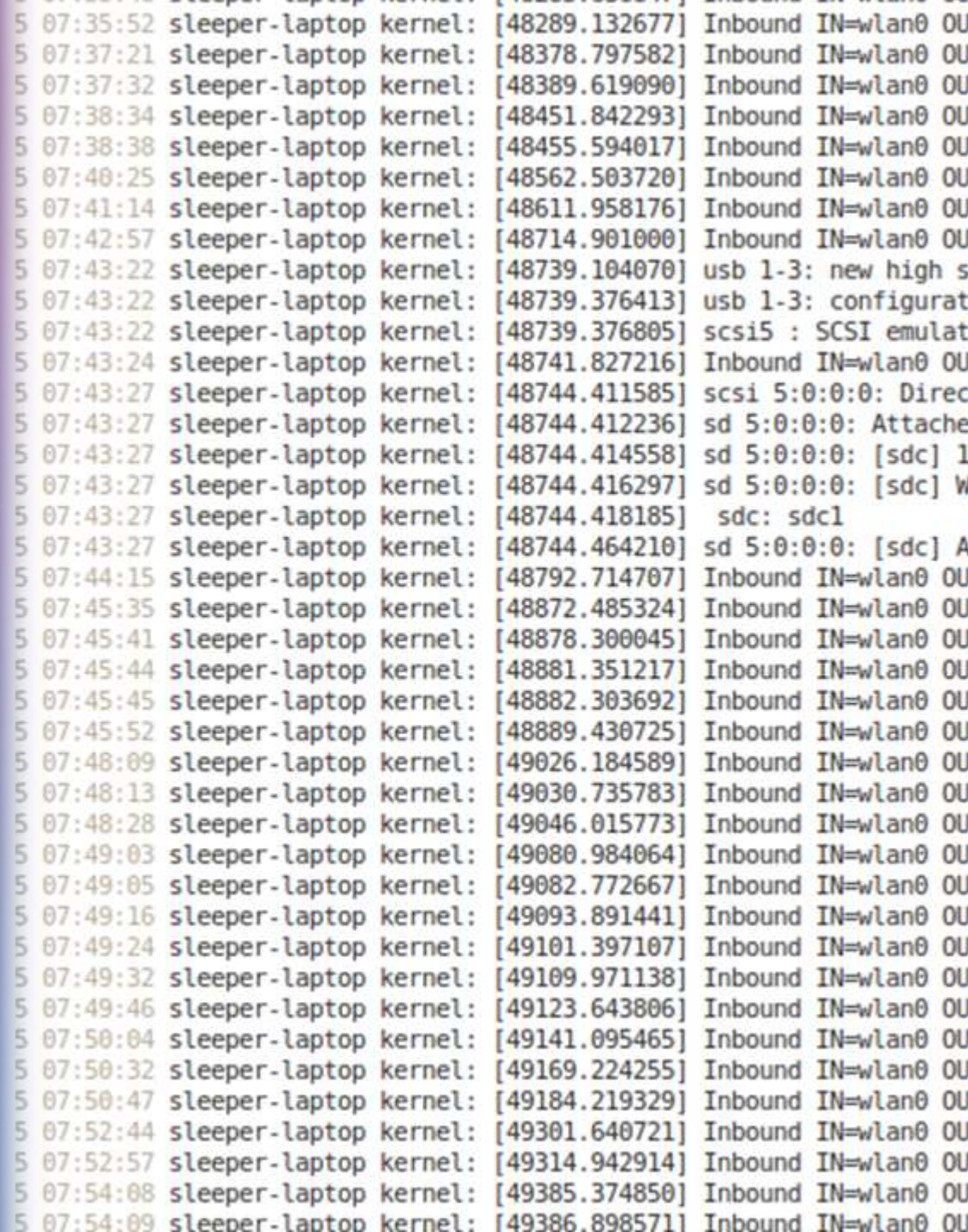


Features	Sequential AFAP	Sequential RT	Distributed AFAP
Classic DEVS	✓	✓	✗
Parallel DEVS	✓	✓	✓



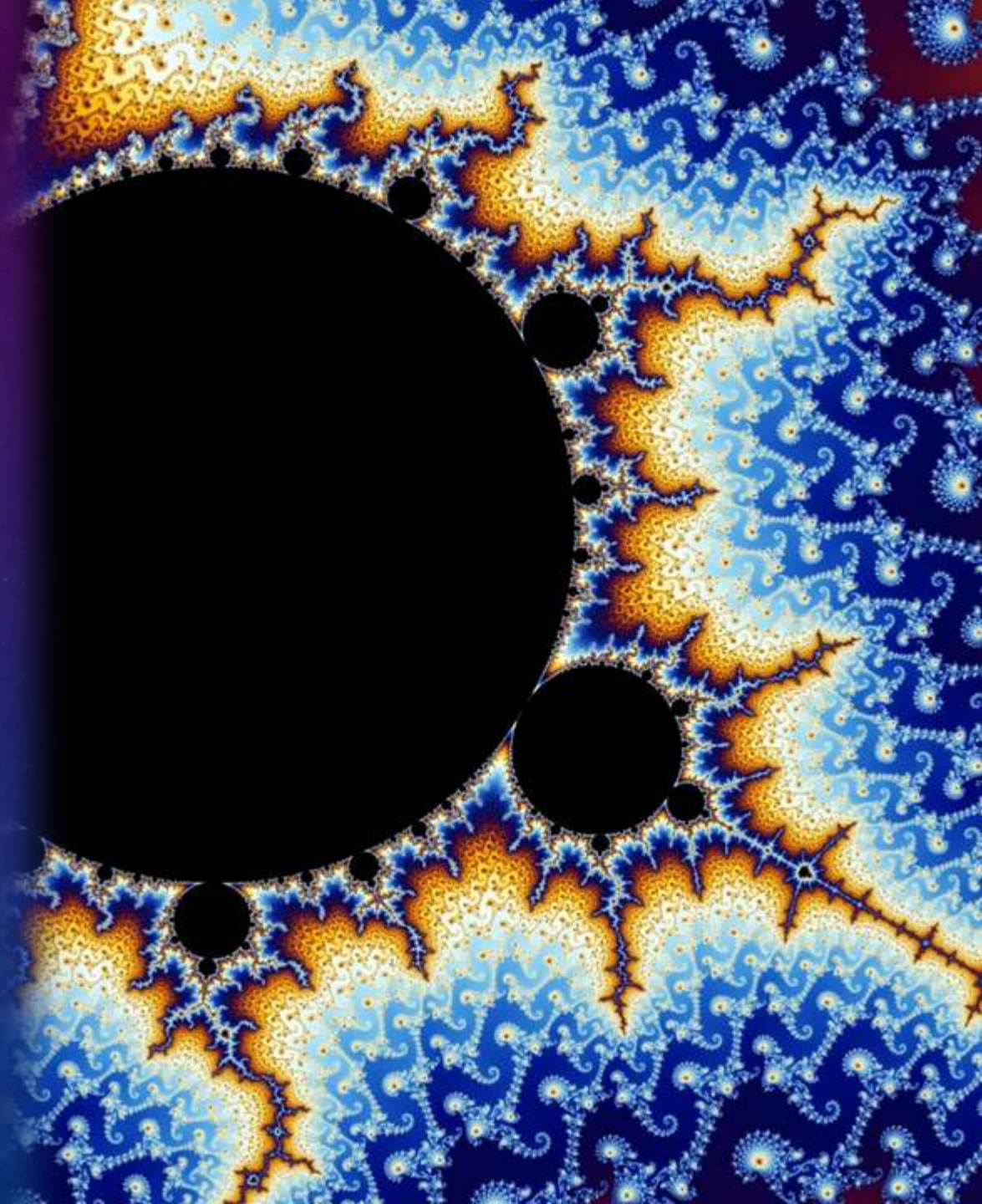
Features	Sequential AFAP	Sequential RT	Distributed AFAP
Classic DEVS	✓	✓	✗
Parallel DEVS	✓	✓	✓
Dynamic Structure	✓	✓	✗

Features	Sequential AFAP	Sequential RT	Distributed AFAP
Classic DEVS	✓	✓	✗
Parallel DEVS	✓	✓	✓
Dynamic Structure	✓	✓	✗
Tracing	✓	✓	✓



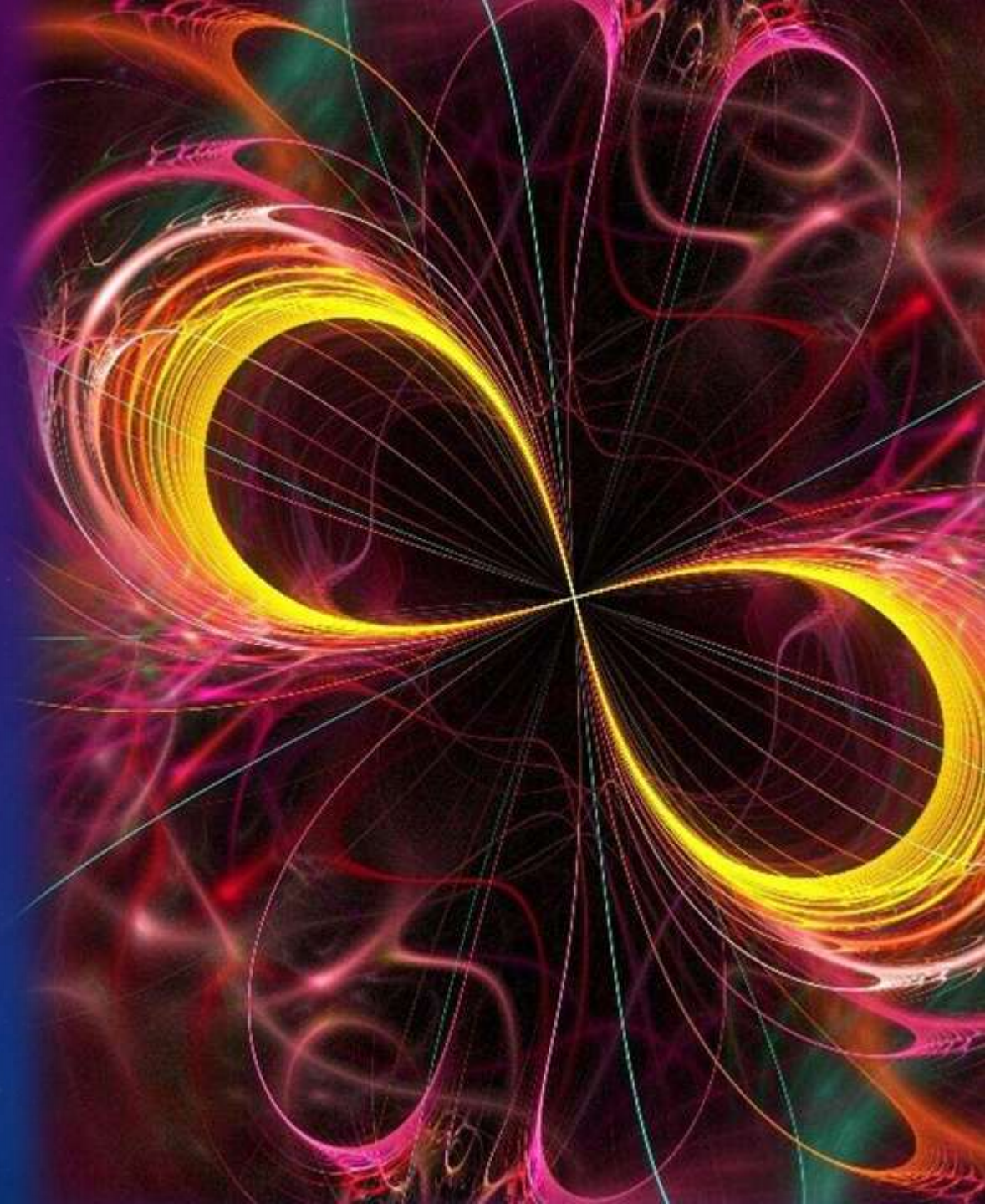
Features	Sequential AFAP	Sequential RT	Distributed AFAP
Classic DEVS	✓	✓	✗
Parallel DEVS	✓	✓	✓
Dynamic Structure	✓	✓	✗
Tracing	✓	✓	✓
Checkpointing	✓	✗	✓

Features	Sequential AFAP	Sequential RT	Distributed AFAP
Classic DEVS	✓	✓	✗
Parallel DEVS	✓	✓	✓
Dynamic Structure	✓	✓	✗
Tracing	✓	✓	✓
Checkpointing	✓	✗	✓
Nested Simulation	✓	✓	✗



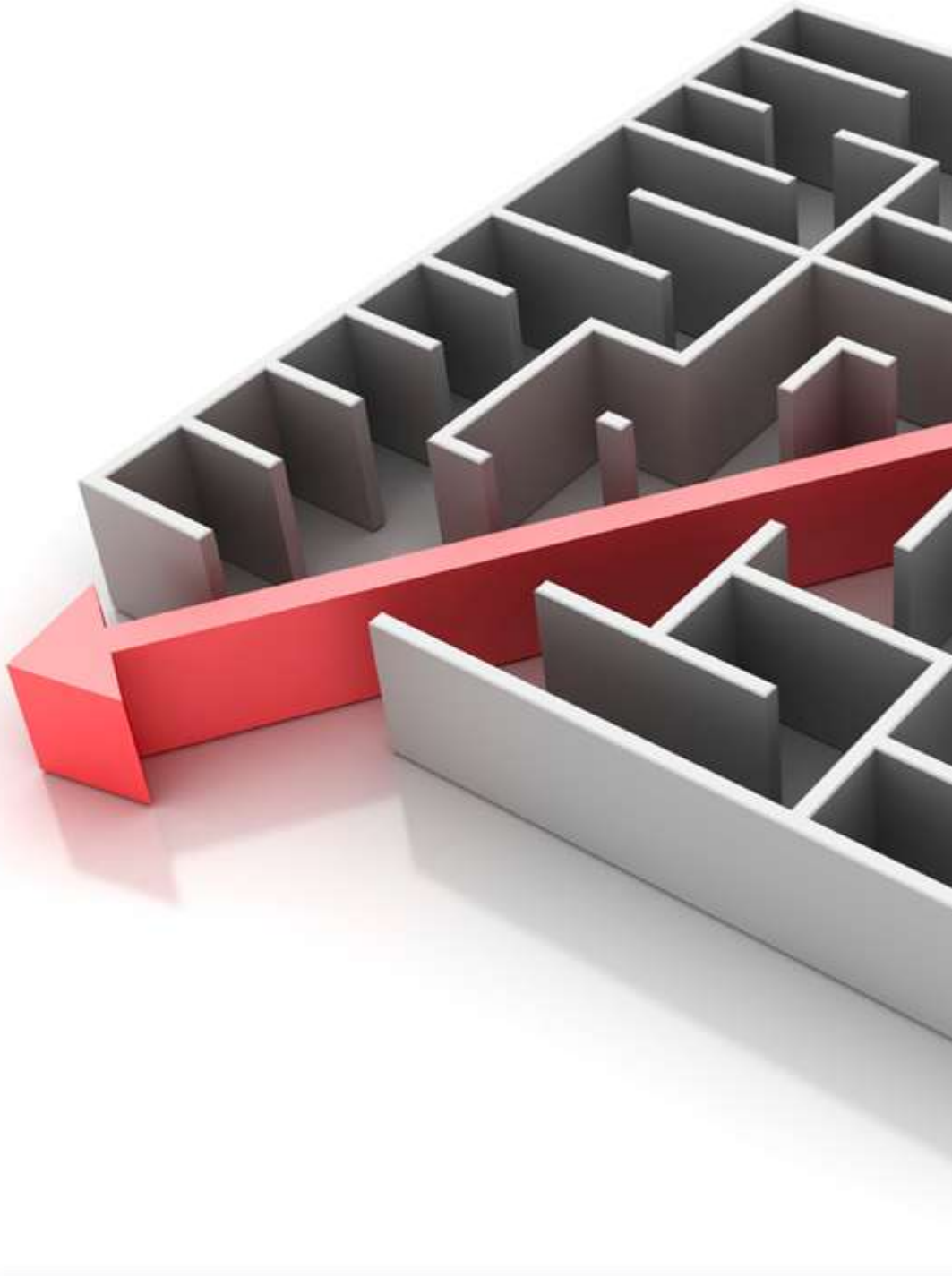
Features	Sequential AFAP	Sequential RT	Distributed AFAP
Classic DEVS	✓	✓	✗
Parallel DEVS	✓	✓	✓
Dynamic Structure	✓	✓	✗
Tracing	✓	✓	✓
Checkpointing	✓	✗	✓
Nested Simulation	✓	✓	✗
Termination Cond.	✓	✓	✓

Features	Sequential AFAP	Sequential RT	Distributed AFAP
Classic DEVS	✓	✓	✗
Parallel DEVS	✓	✓	✓
Dynamic Structure	✓	✓	✗
Tracing	✓	✓	✓
Checkpointing	✓	✗	✓
Nested Simulation	✓	✓	✗
Termination Cond.	✓	✓	✓
Livelock Detection	✓	✓	✓

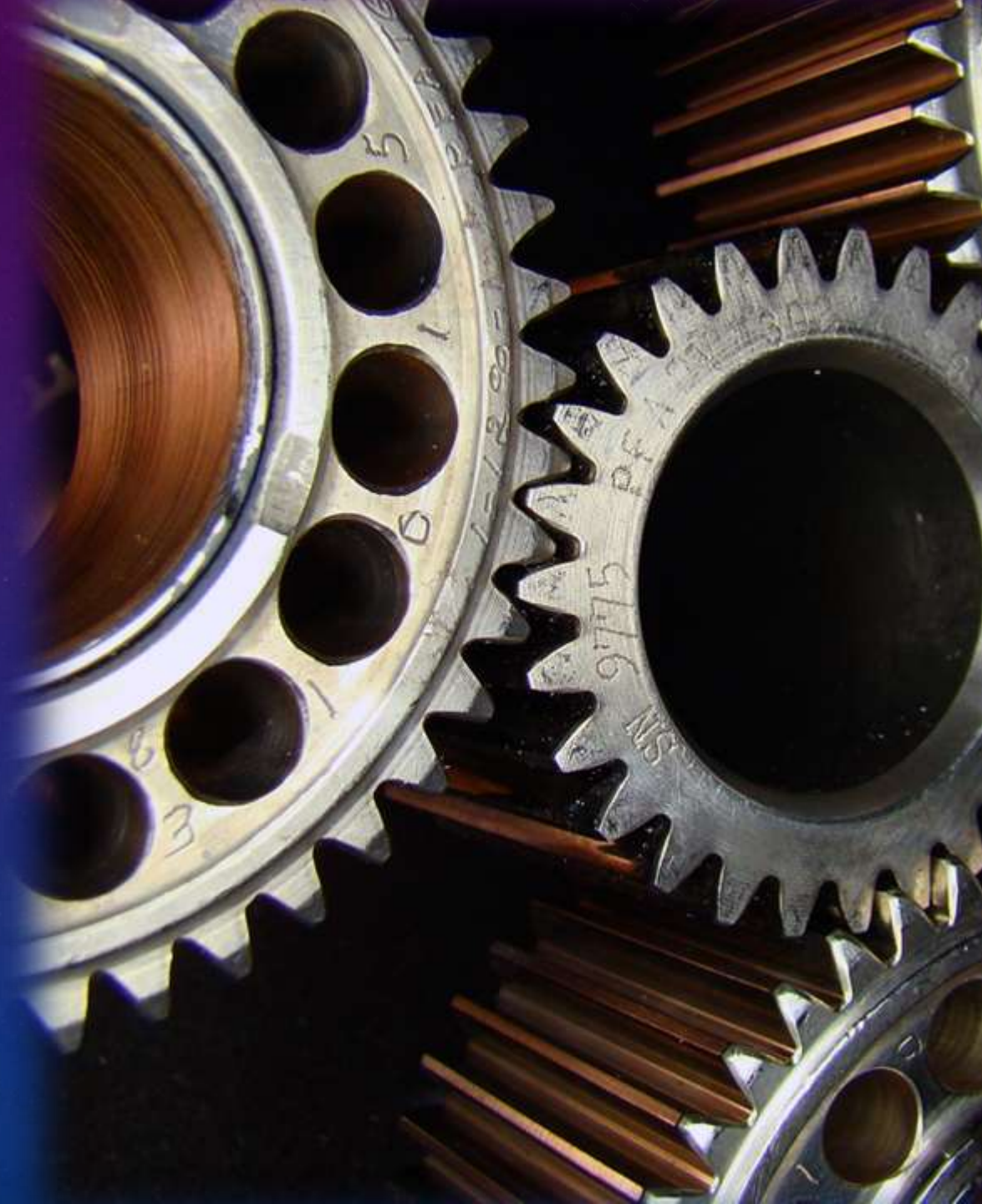


Features	Sequential AFAP	Sequential RT	Distributed AFAP
Classic DEVS	✓	✓	✗
Parallel DEVS	✓	✓	✓
Dynamic Structure	✓	✓	✗
Tracing	✓	✓	✓
Checkpointing	✓	✗	✓
Nested Simulation	✓	✓	✗
Termination Cond.	✓	✓	✓
Livelock Detection	✓	✓	✓
Transfer Functions	✓	✓	✓

Performance	Sequential AFAP	Sequential RT	Distributed AFAP
Direct Connect	✓	✓	✓



Performance	Sequential AFAP	Sequential RT	Distributed AFAP
Direct Connect	✓	✓	✓
Single Loop	✓	✓	✓



Performance	Sequential AFAP	Sequential RT	Distributed AFAP
Direct Connect	✓	✓	✓
Single Loop	✓	✓	✓
Termination Time	✓	✓	✓

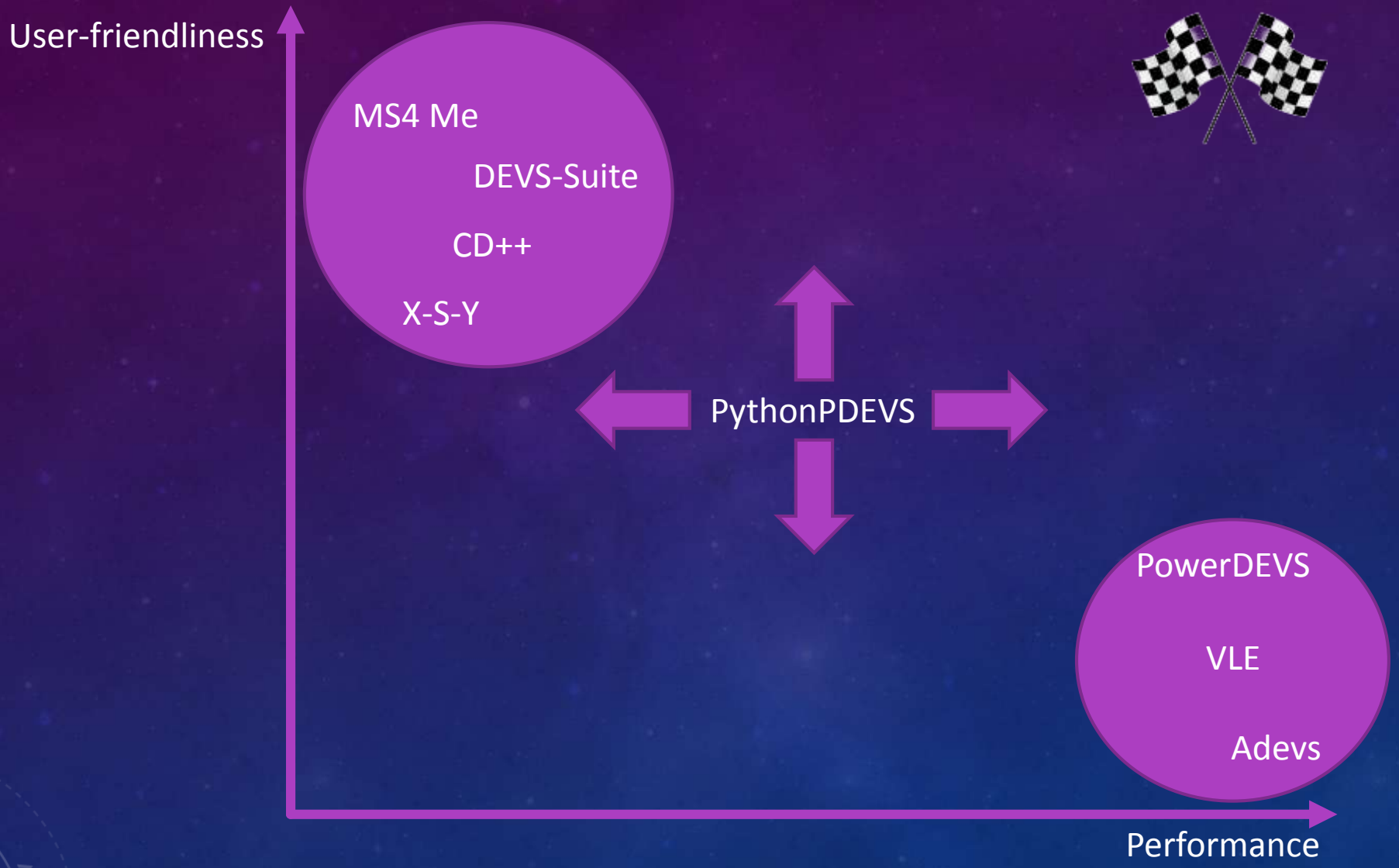
Performance	Sequential AFAP	Sequential RT	Distributed AFAP
Direct Connect	✓	✓	✓
Single Loop	✓	✓	✓
Termination Time	✓	✓	✓
Scheduling Hints	✓	✓	✓

Performance	Sequential AFAP	Sequential RT	Distributed AFAP
Direct Connect	✓	✓	✓
Single Loop	✓	✓	✓
Termination Time	✓	✓	✓
Scheduling Hints	✓	✓	✓
Migration Hints	✗	✗	✓

Performance	Sequential AFAP	Sequential RT	Distributed AFAP
Direct Connect	✓	✓	✓
Single Loop	✓	✓	✓
Termination Time	✓	✓	✓
Scheduling Hints	✓	✓	✓
Migration Hints	✗	✗	✓
Allocation Hints	✗	✗	✓

Performance	Sequential AFAP	Sequential RT	Distributed AFAP
Direct Connect	✓	✓	✓
Single Loop	✓	✓	✓
Termination Time	✓	✓	✓
Scheduling Hints	✓	✓	✓
Migration Hints	✗	✗	✓
Allocation Hints	✗	✗	✓
Memoization Hints	✗	✗	✓

Performance	Sequential AFAP	Sequential RT	Distributed AFAP
Direct Connect	✓	✓	✓
Single Loop	✓	✓	✓
Termination Time	✓	✓	✓
Scheduling Hints	✓	✓	✓
Migration Hints	✗	✗	✓
Allocation Hints	✗	✗	✓
Memoization Hints	✗	✗	✓
Copy Hints	✓	✓	✓


User-friendliness
MS4 Me
DEVS-Suite
CD++
X-S-Y
PythonPDEVS
PowerDEVS
VLE
Adevs
Performance