



Embracing Observability

in Modern **Python** Applications:
Harnessing the Power of **OpenTelemetry**

About Me

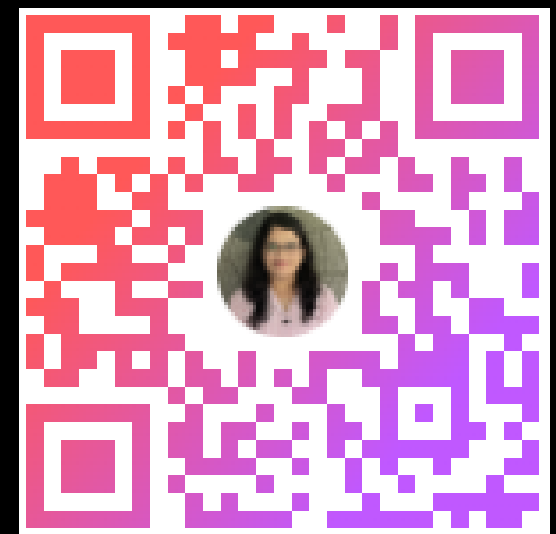
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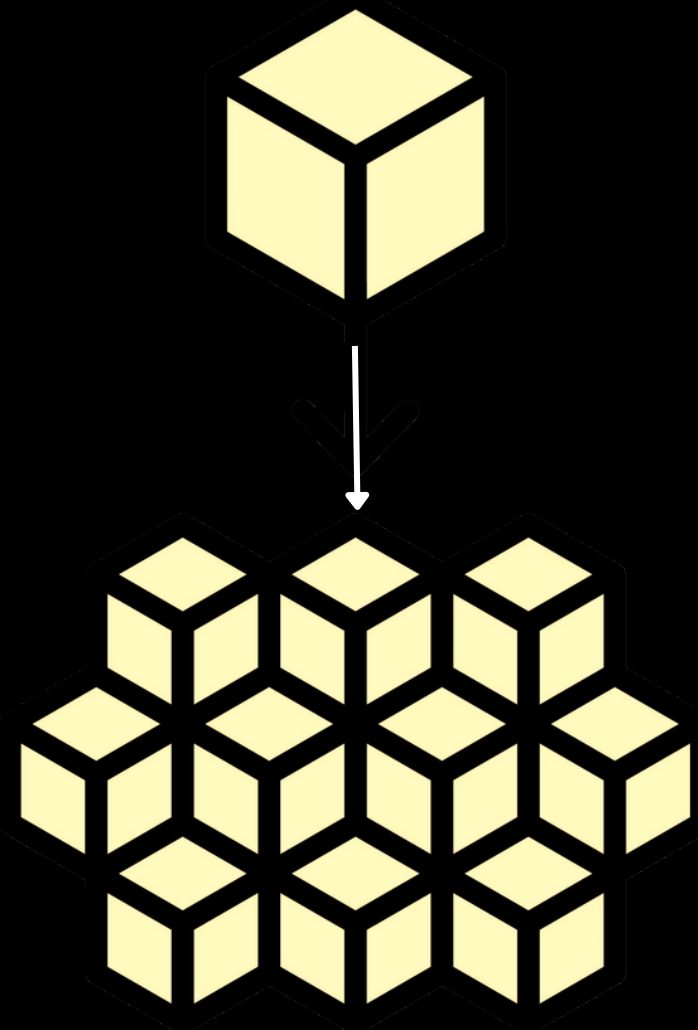
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Evolution of software industry

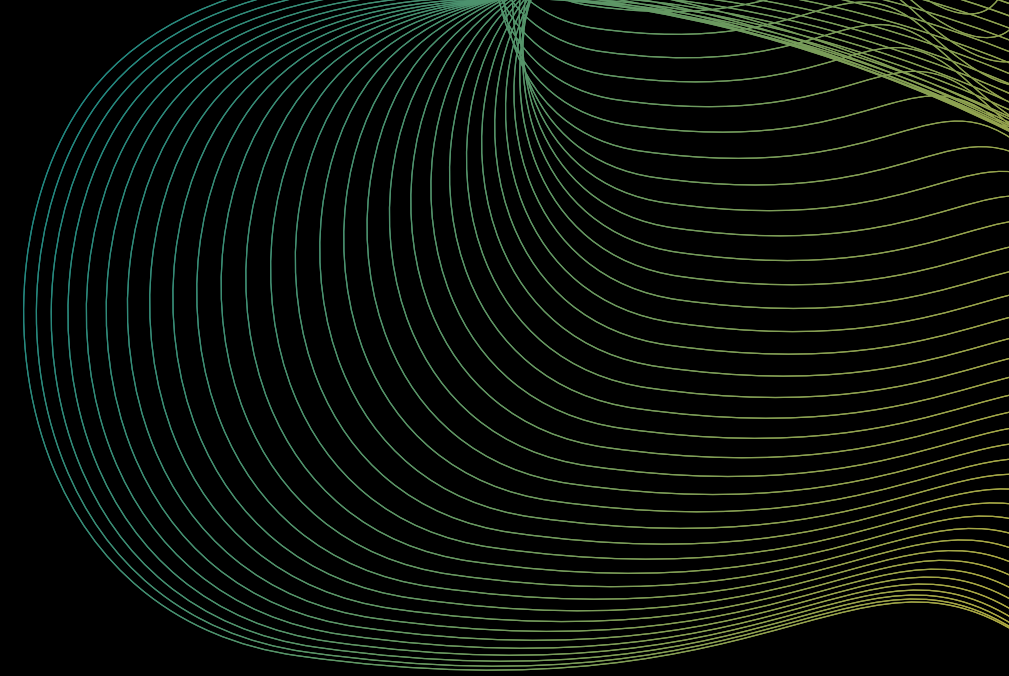


Strategies for debugging

- Metrics & Logs
- Dashboards and alerts



Challenges with traditional debugging strategies



- Insufficient Correlation
- Not drilling down
- Tool hopping
- Experience directly proportional to ease of debugging
- Untracked metric - investigative approach.

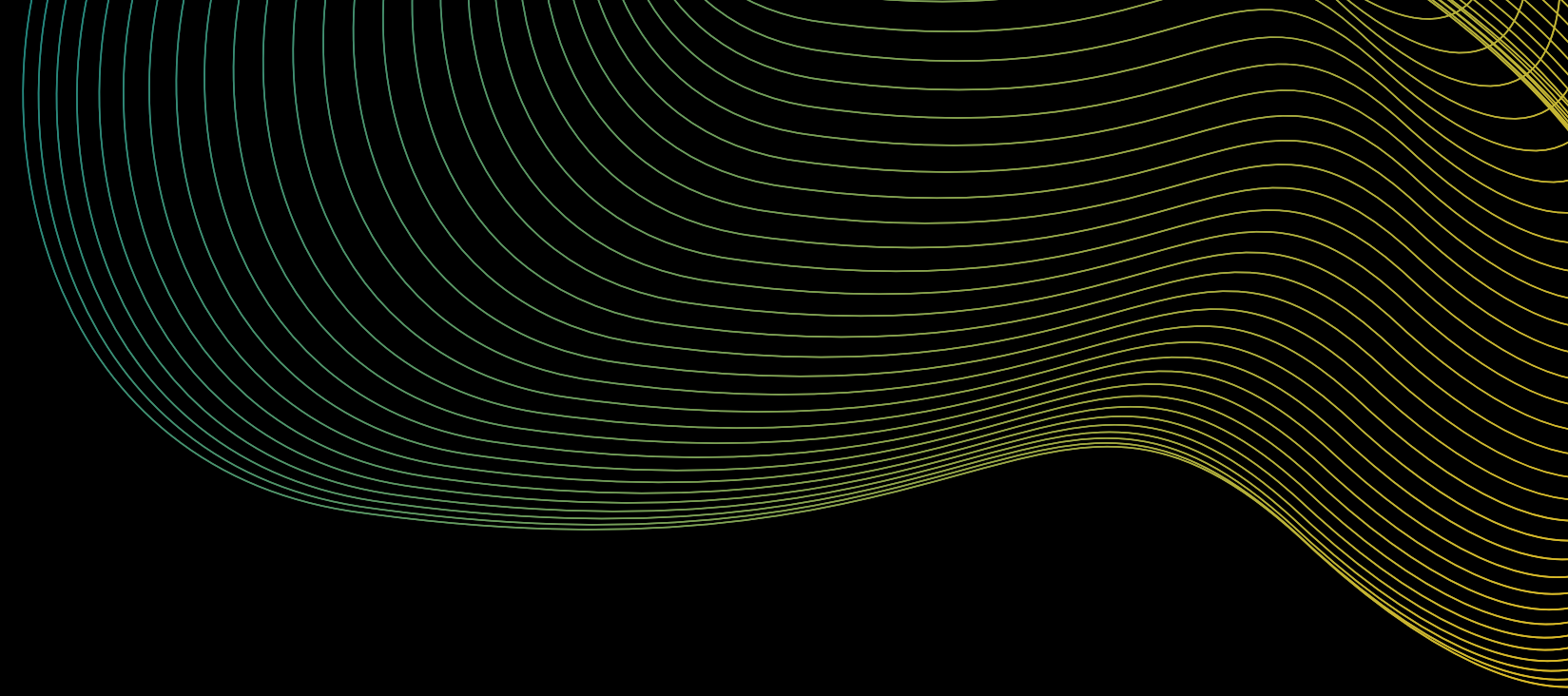


How do we tackle this?

- Exploring the system in open ended ways
- Cardinality and dimensionality
- Slice and dice data in different dimensions



Enter Observability



- Rudolf E. Kálmán in 1960
- Mathematical Control Systems
- Measure of how well internal states of a system can be inferred from knowledge of its external outputs.
- Relevant for mechanical or process engineers who manage physical systems with an end state in mind



Observability in Software Systems

- Understand your application's inner workings.
- Grasp unforeseen and novel system states.
- Use external tools to discern inner operations and states.
- Avoid deploying custom code for internal state comprehension.



So what is Observability?

A measure of how well you can understand and explain any state your system can get into, no matter how novel or bizarre.



Structured Events

- Fundamental building block of Observability
- Makes analysis possible to any level needed.
- Starts with an event - record of everything that occurred while one particular request interacted with your service



Instrumentation for observability

- Distributed Tracing - Clearly shows the relationship between services in a distributed system.
- Gained traction in 2010 after Google's Dapper paper by Sigelman
- Open Source projects - Zipkin (Twitter - 2012) and Jaegar (Uber - 2017)



Open Telemetry

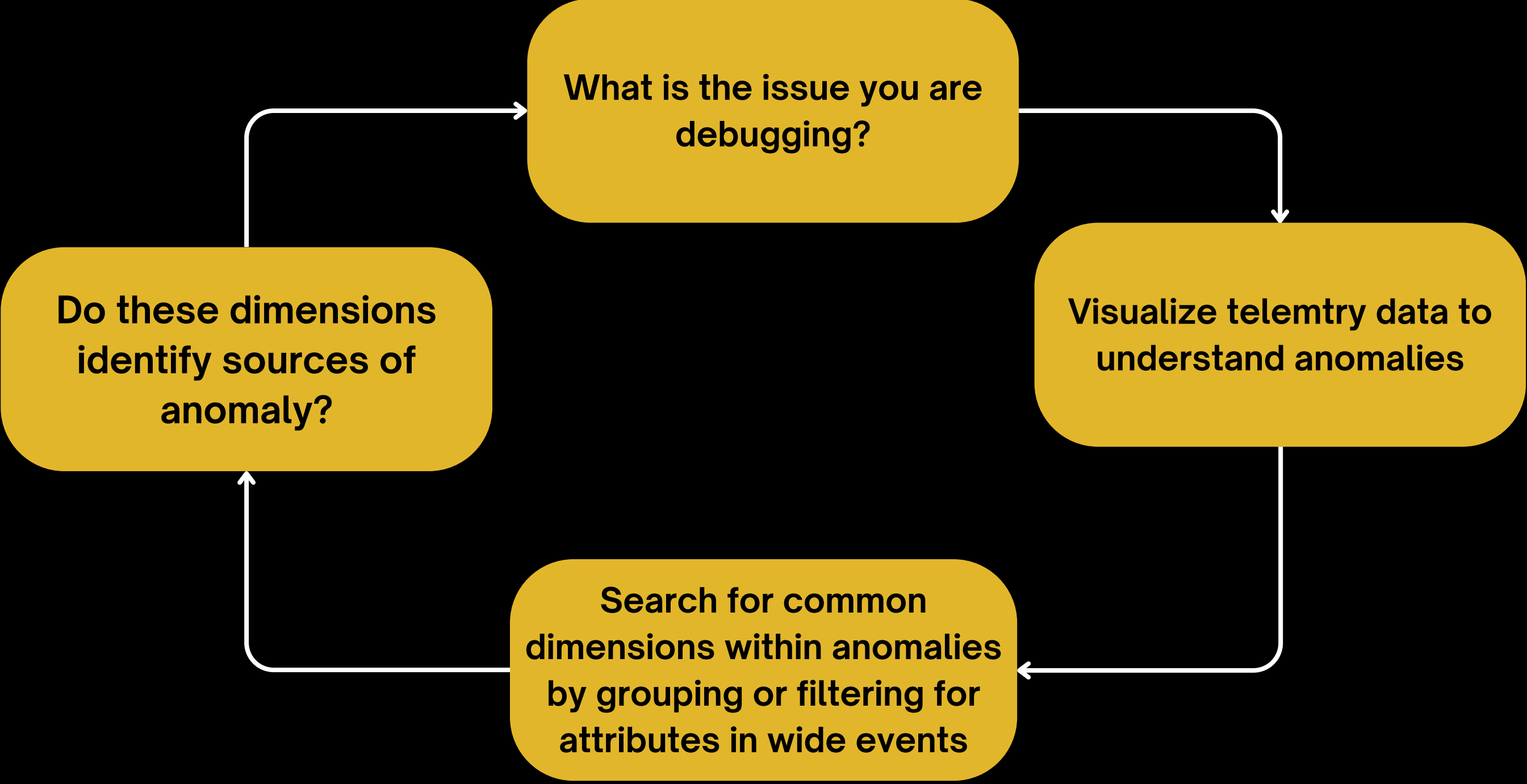
Upgrade from OpenCensus(2017) and OpenTracing(2016)

The single open source standard for application instrumentation

Automatic Instrumentation and Custom Instrumentation



Analyzing events for observability

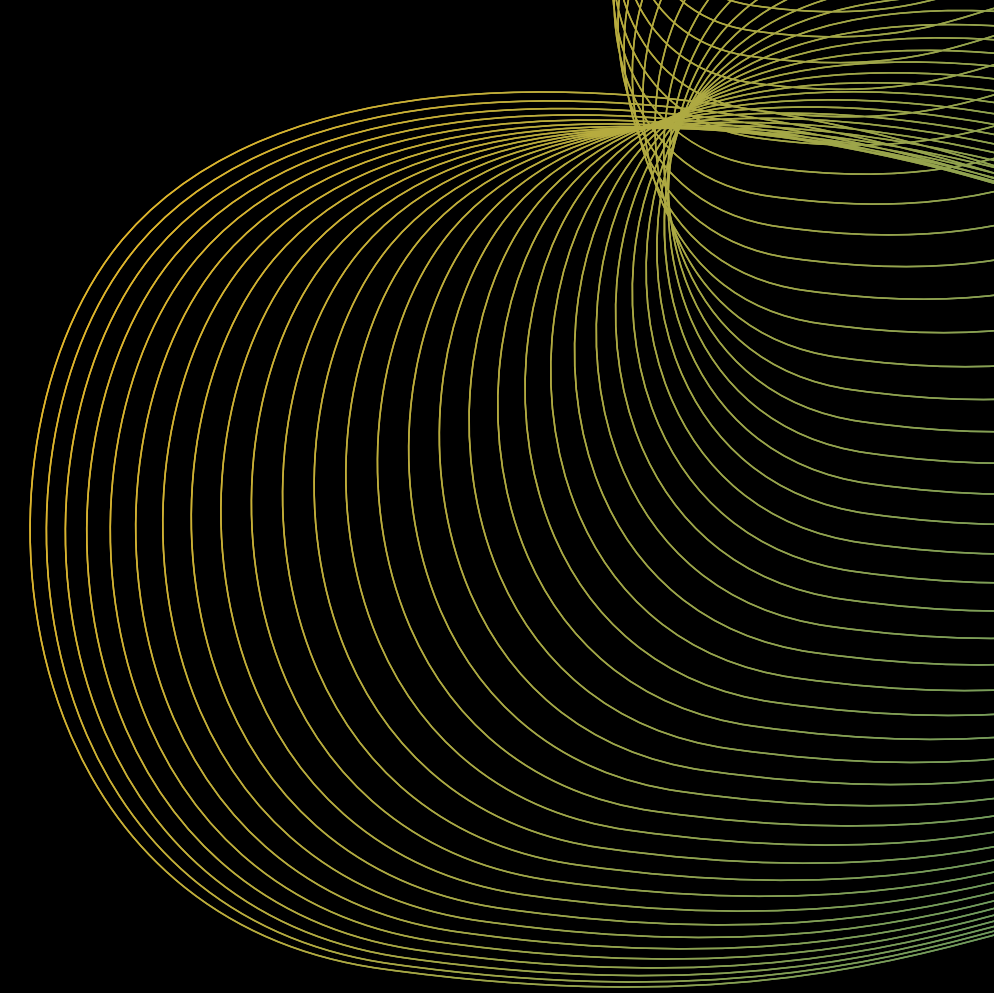


Core Analysis Loop



Advantages of Observability Driven Development

- Favours the curious
- Avoid spending time creating runbooks and dashboards
- Debug from first principles



Challenges for Observable systems

- Data volumes can be resource intensive.
- Adapting practices to teams.
- Data privacy and security.



Slides for the talk

<https://angelinjohn.com/index.php/pycon-india-2023/>

or



Thank You