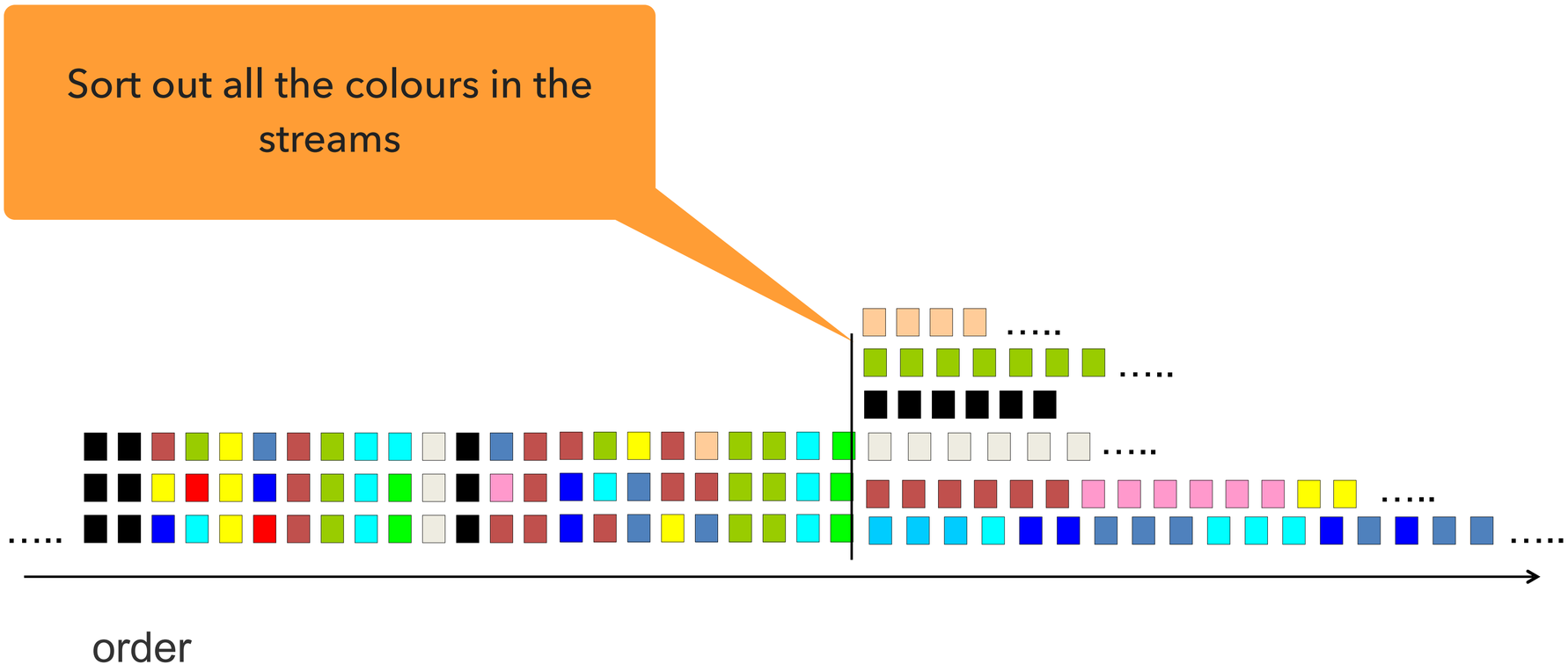
An Outlook on Graph Stream Processing Benchmarks

Riccardo Tommasini - 16/08/2021 - LDBCW@VLDB

Who I Am

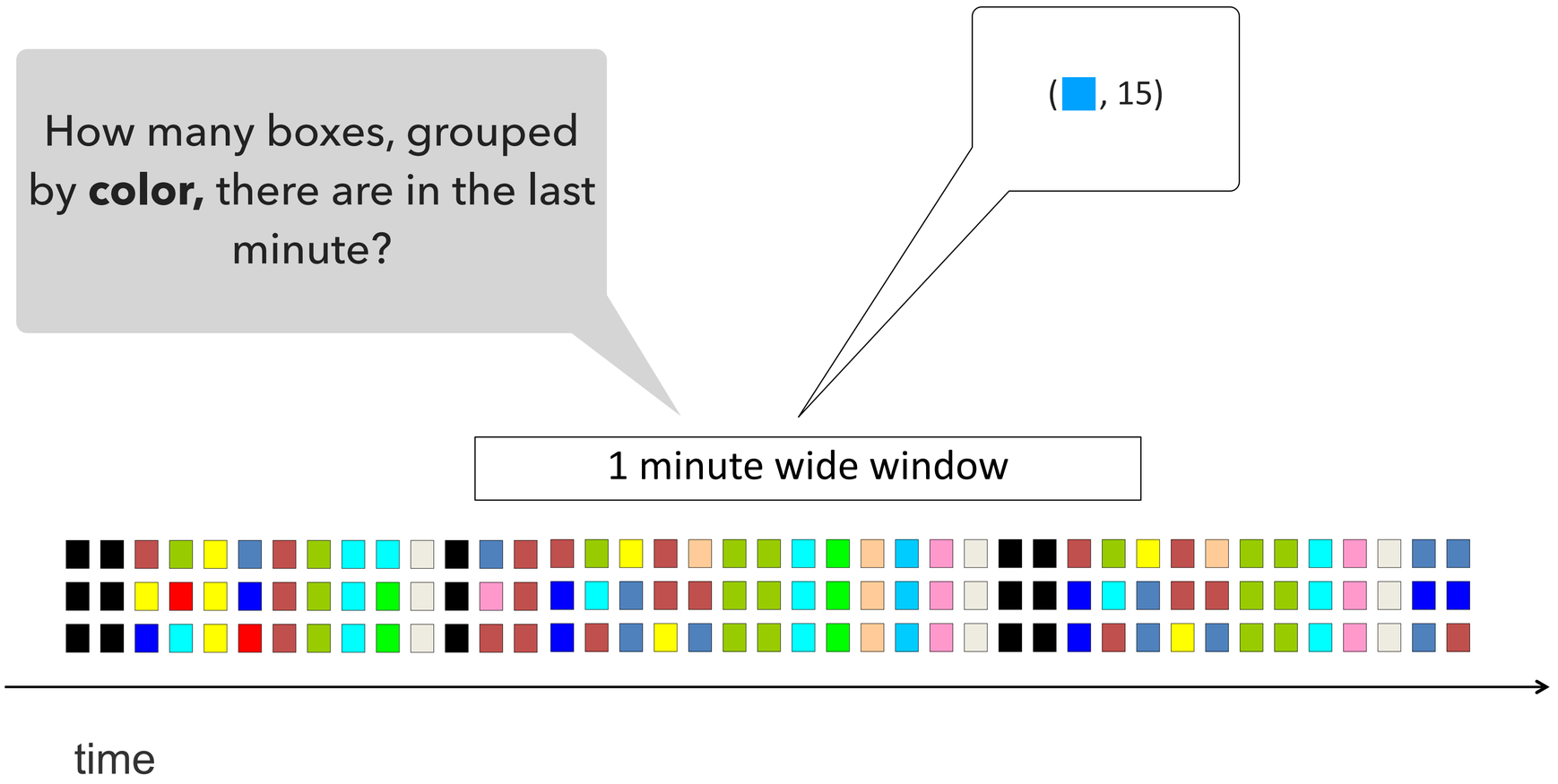
- Assistant Professor @ University of Tartu
- Maitre de Conférence @ INSA Lyon since 01/10/2021
- Maintainer of RSP4J library

What is Stream Processing

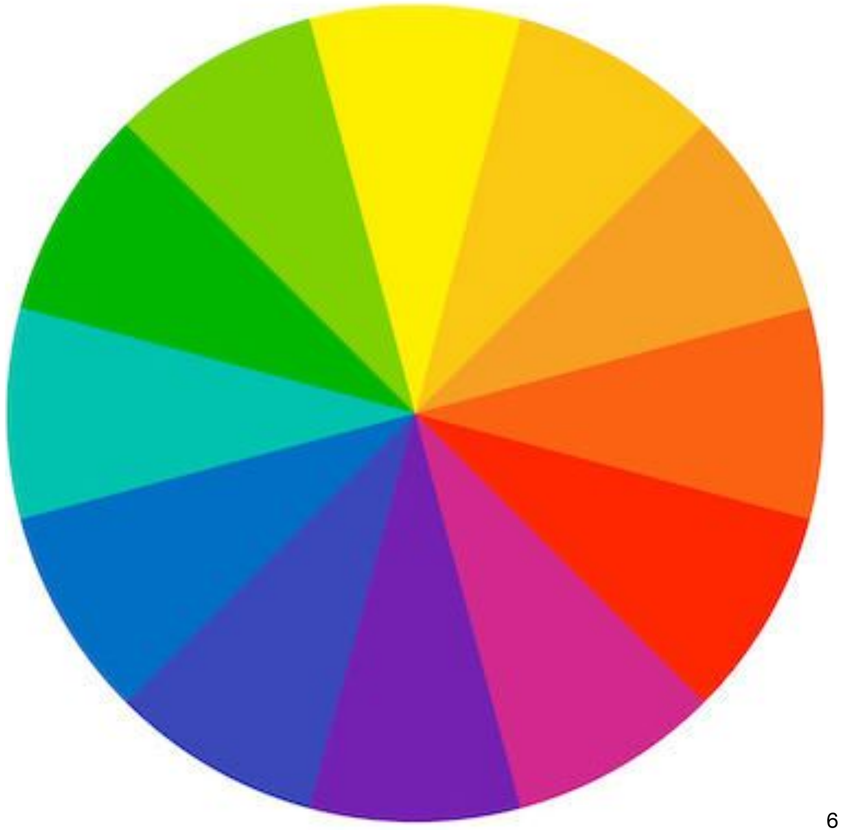


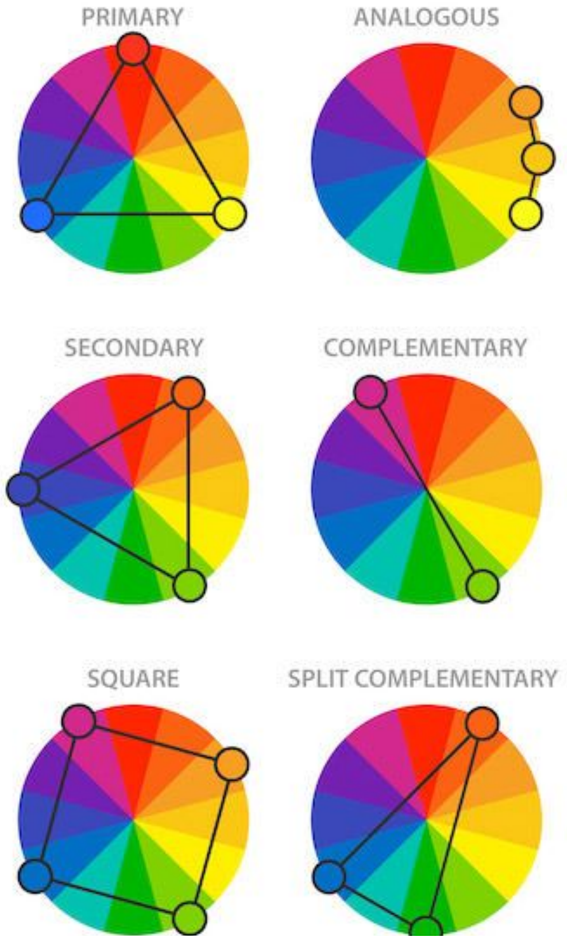
GIF制作

Data Stream Management Systems

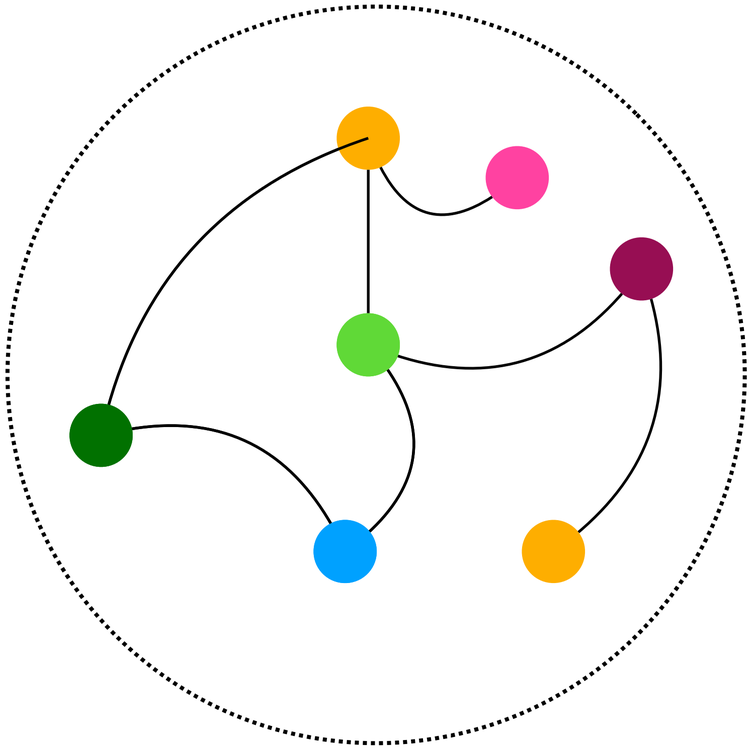


What About Graph?

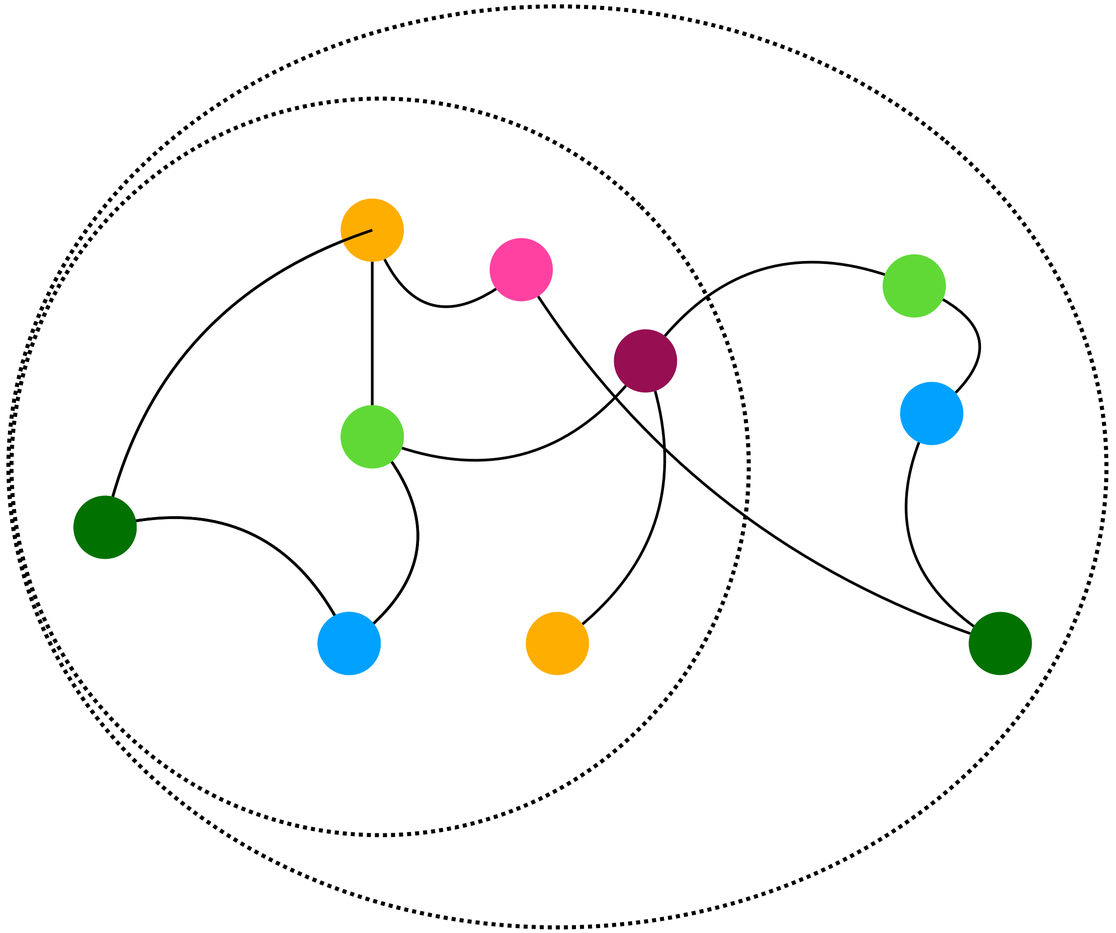




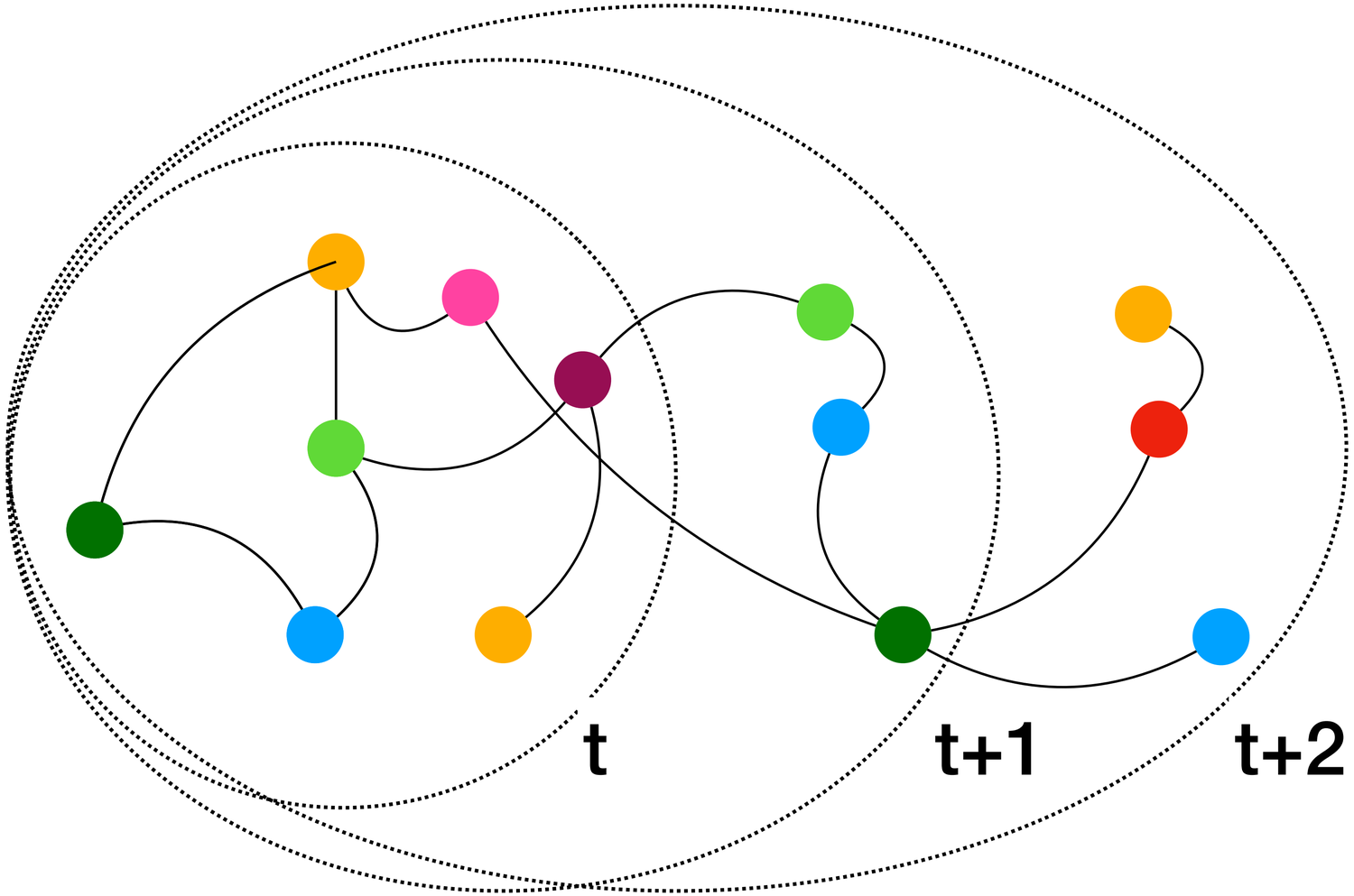
Streaming Graphs



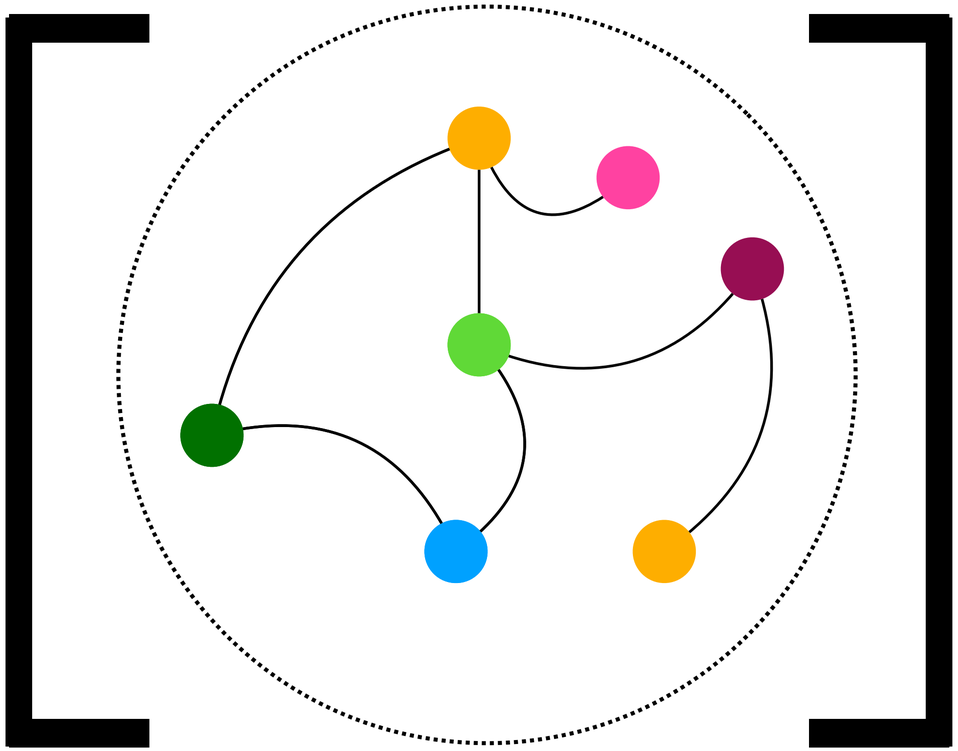
Streaming Graphs



Streaming Graphs



Dynamic Graphs



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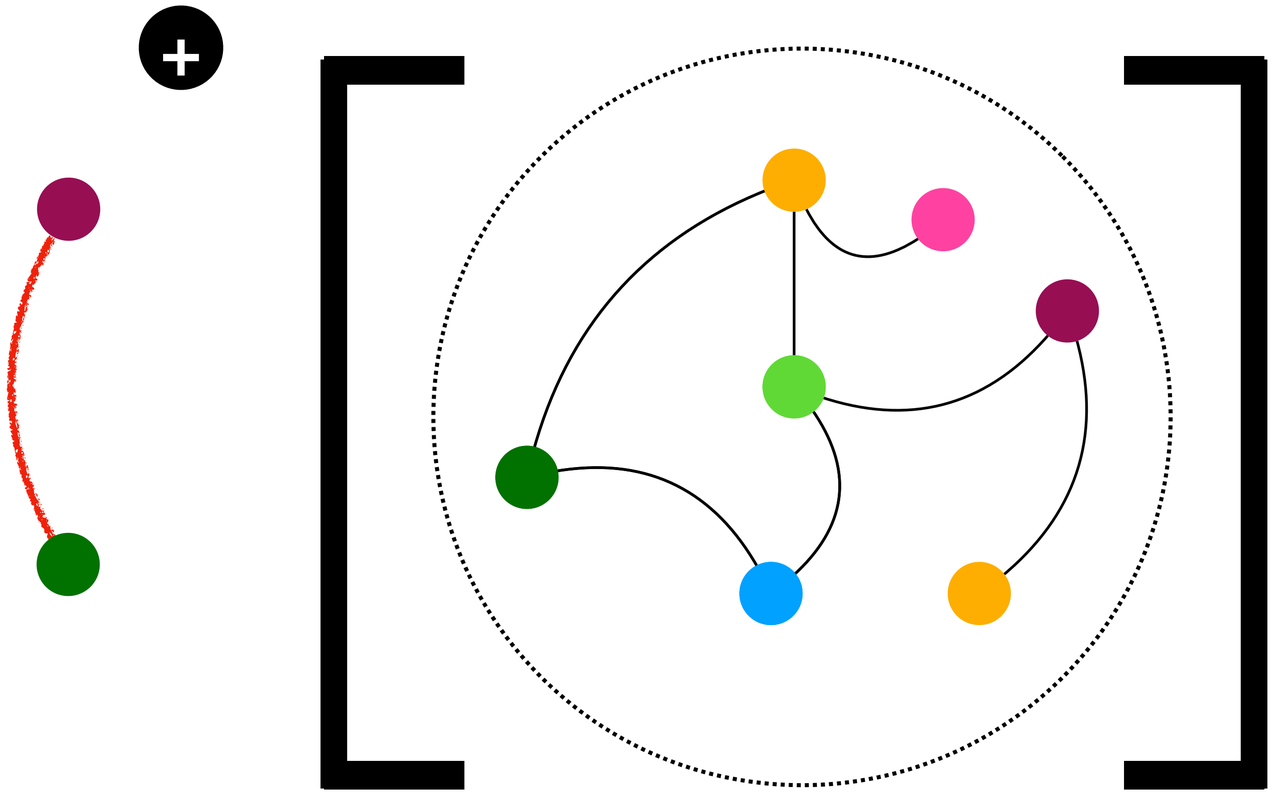
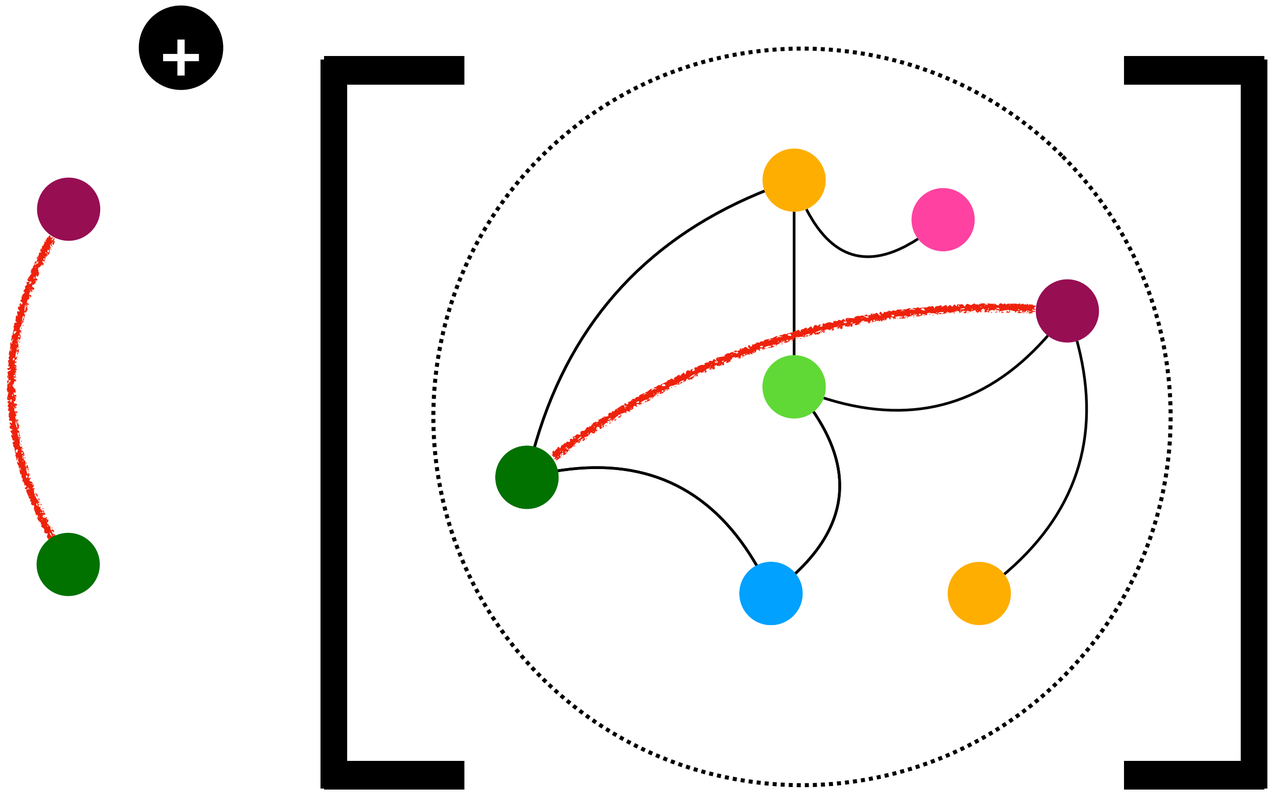
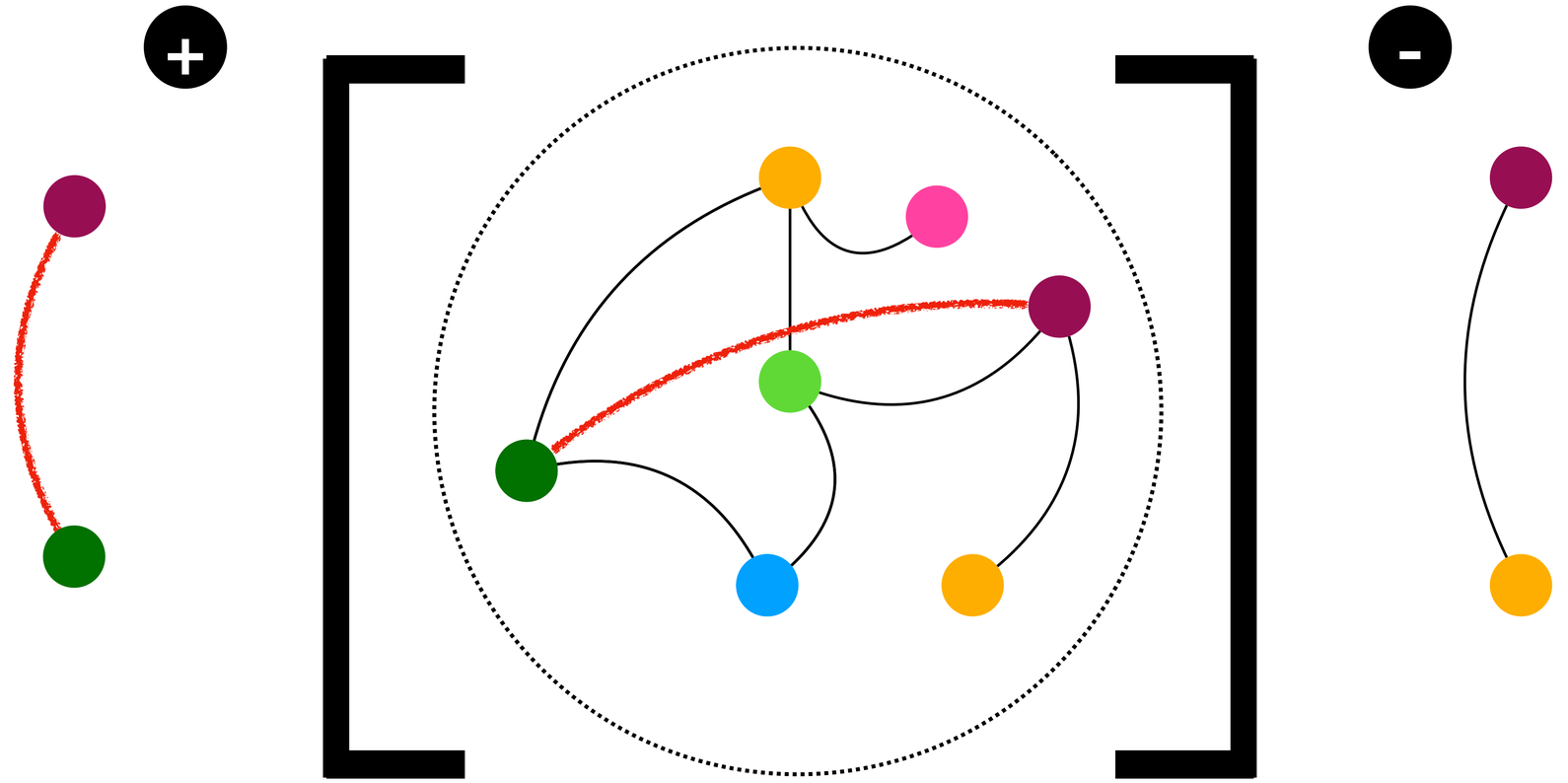


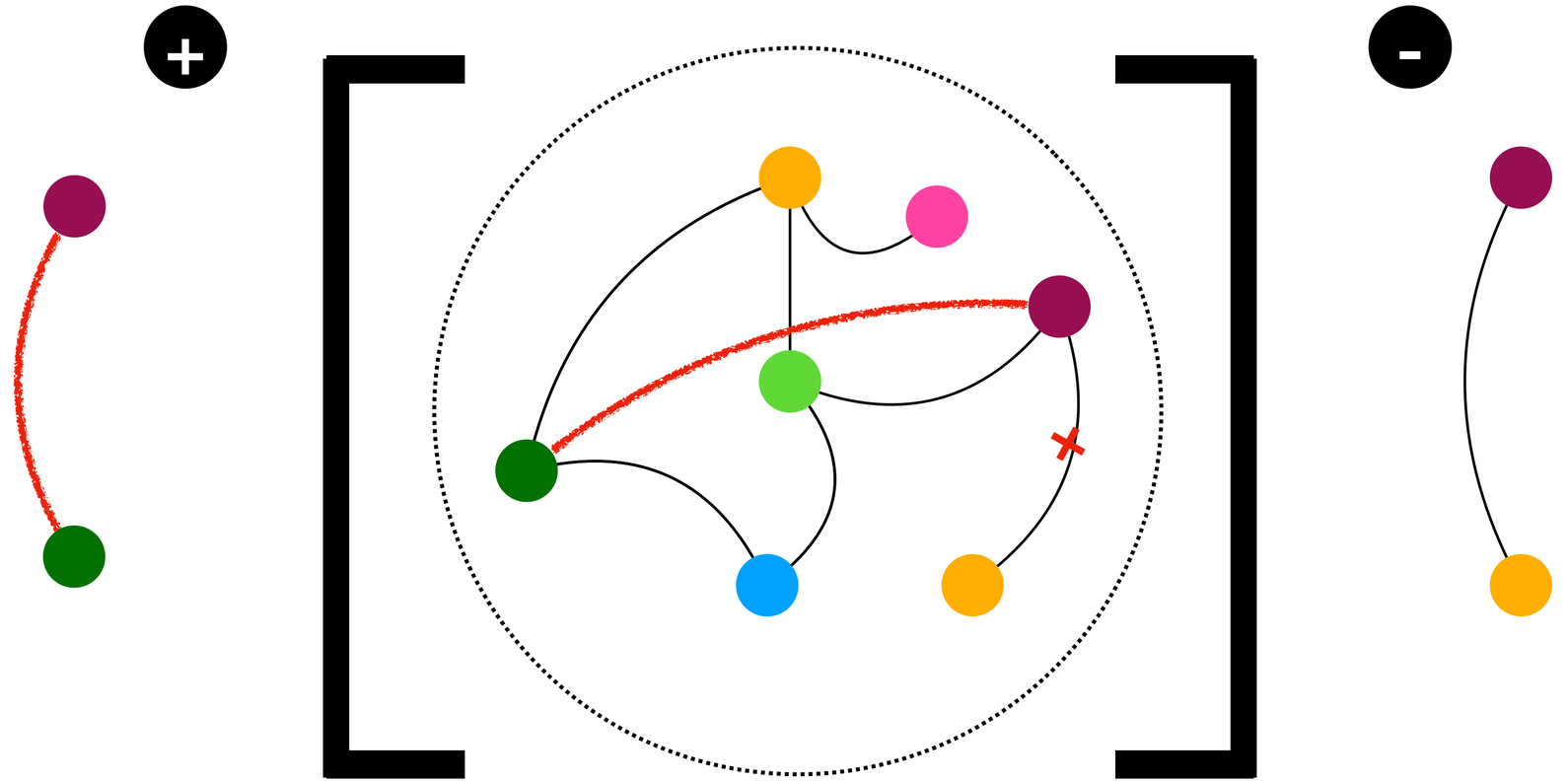
Dynamic Graphs



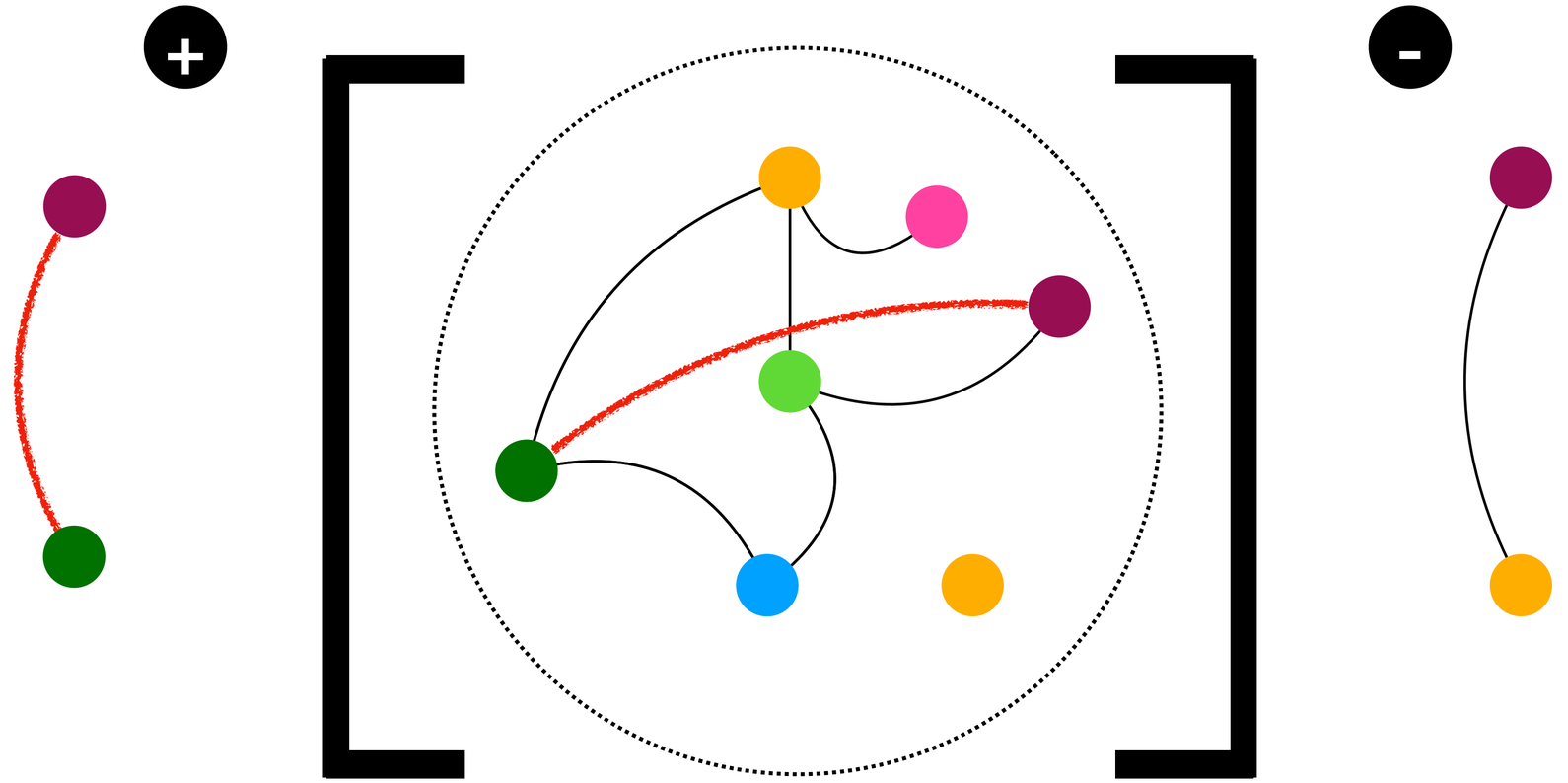
Dynamic Graphs



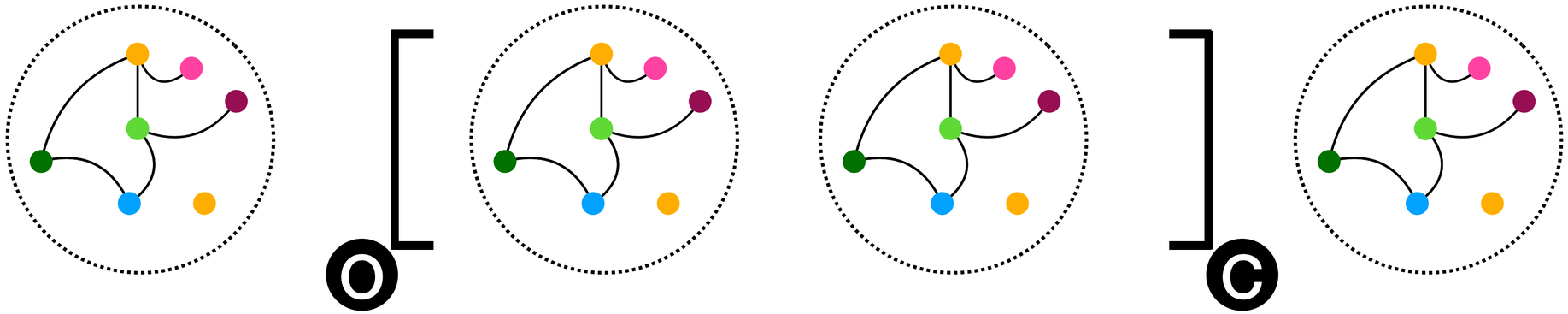
Dynamic Graphs



Dynamic Graphs



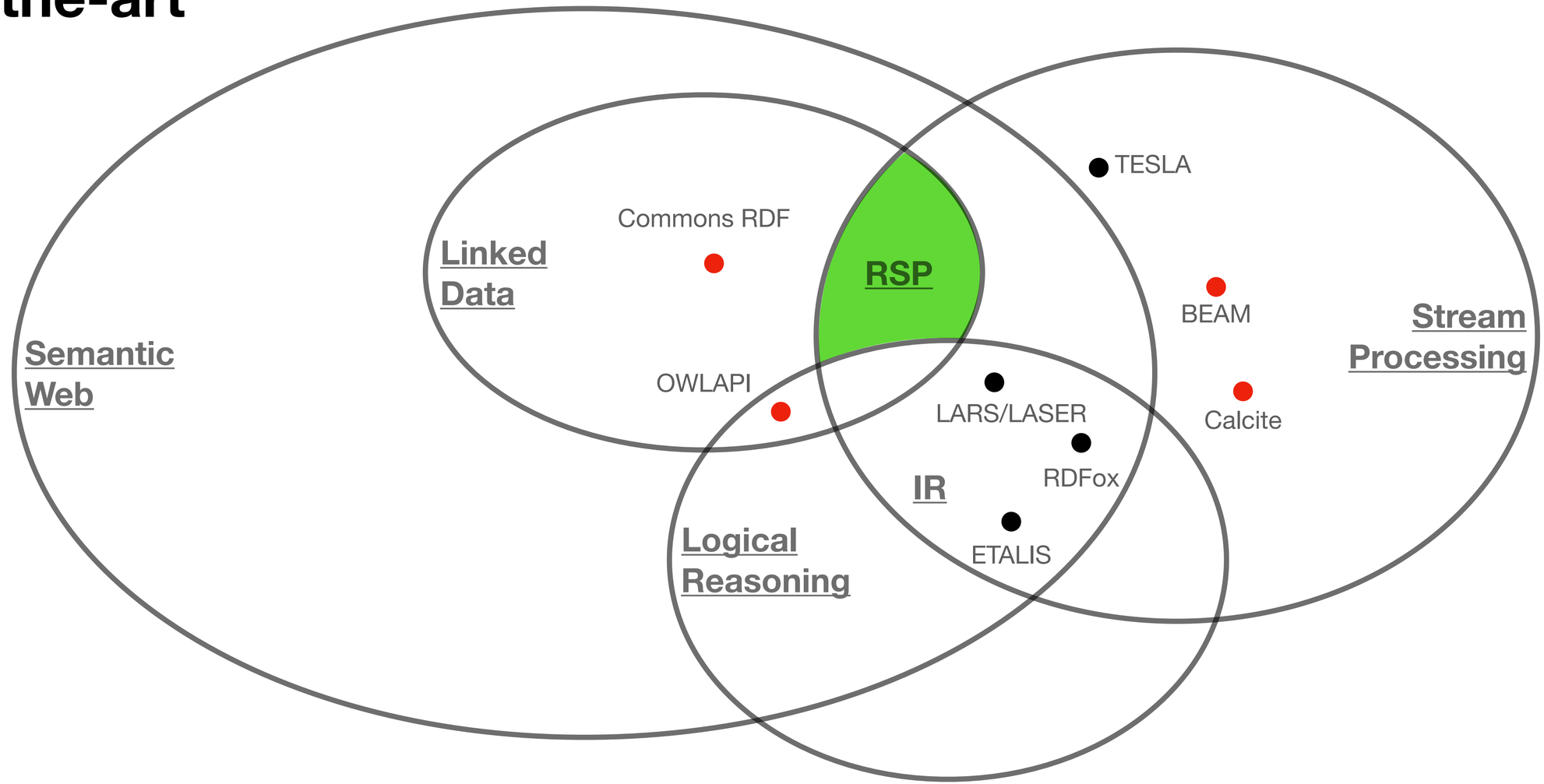
Graph Streams



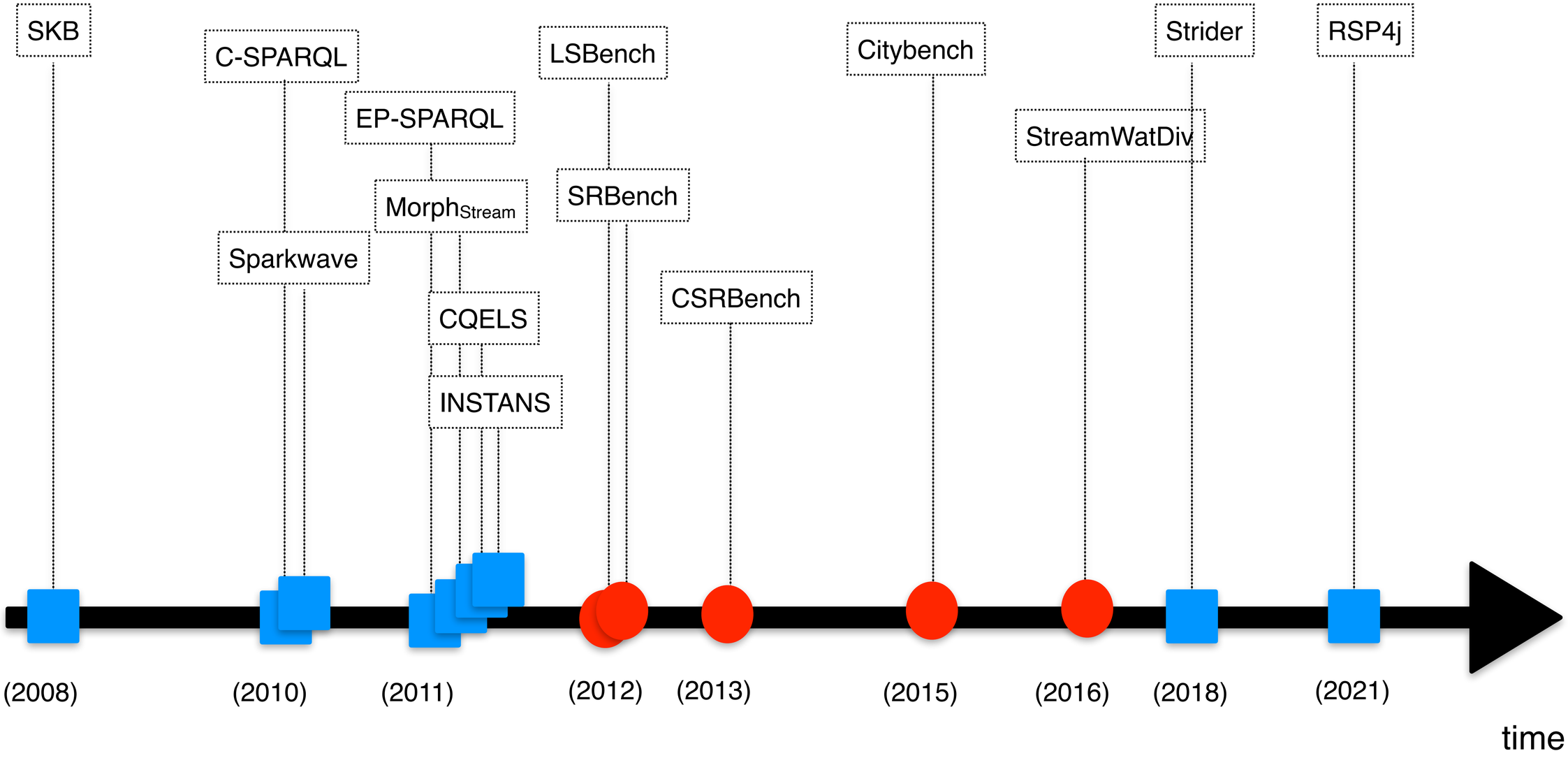
RDF Streams

RDF Stream Processing

State-of-the-art



RSP State-of-the-art: Timeline



LSBench
SRBench
CityBench
StreamWatDiv
DEBS Gran Challenge

LSBench

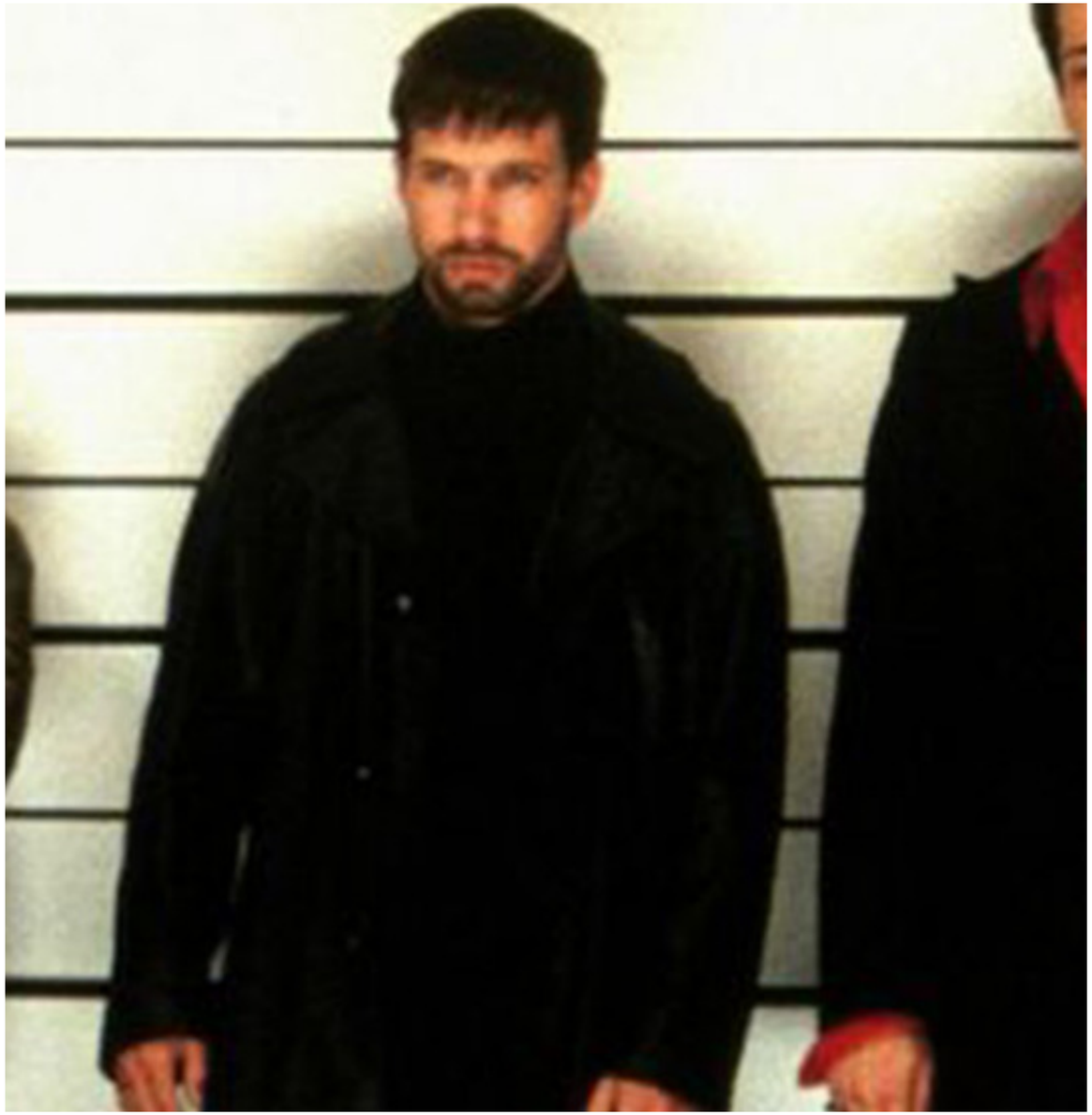
Le Phuoc et al.

- Simple: Social Media (Synthetic)
- Relevant: Static + Streaming
- ~~Portable: not for the code~~
- Scalable: Generator
- KPI: Max Throughput & Memory

SRBench

Y Zhang et al.

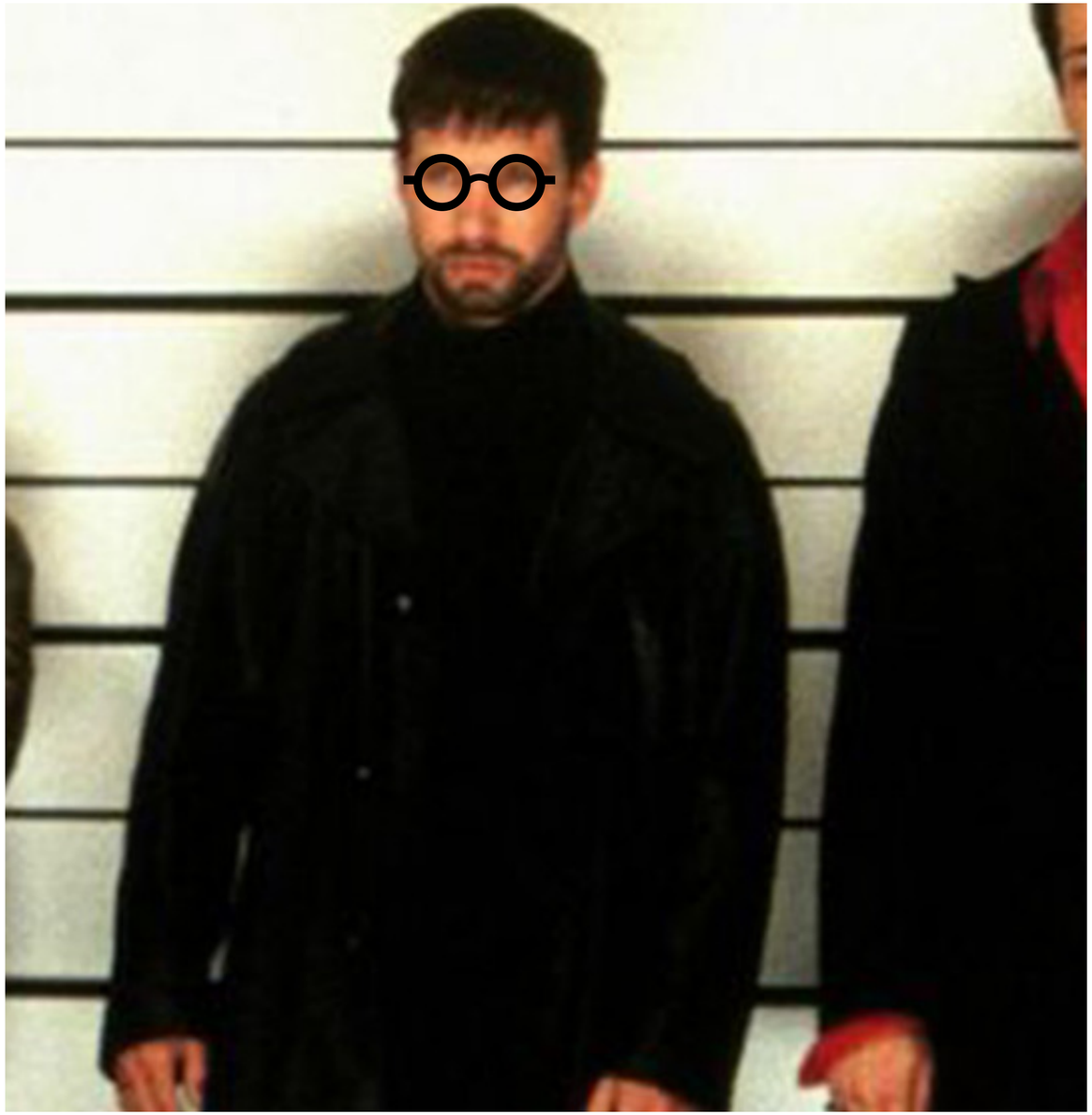
- Simple: Weather/Sensor
- Relevant: Real Data
- Portable: data only + query
- ~~Scalable~~
- KPI: Query Coverage



(C)SRBench

Daniele Dell'Aglio et al.

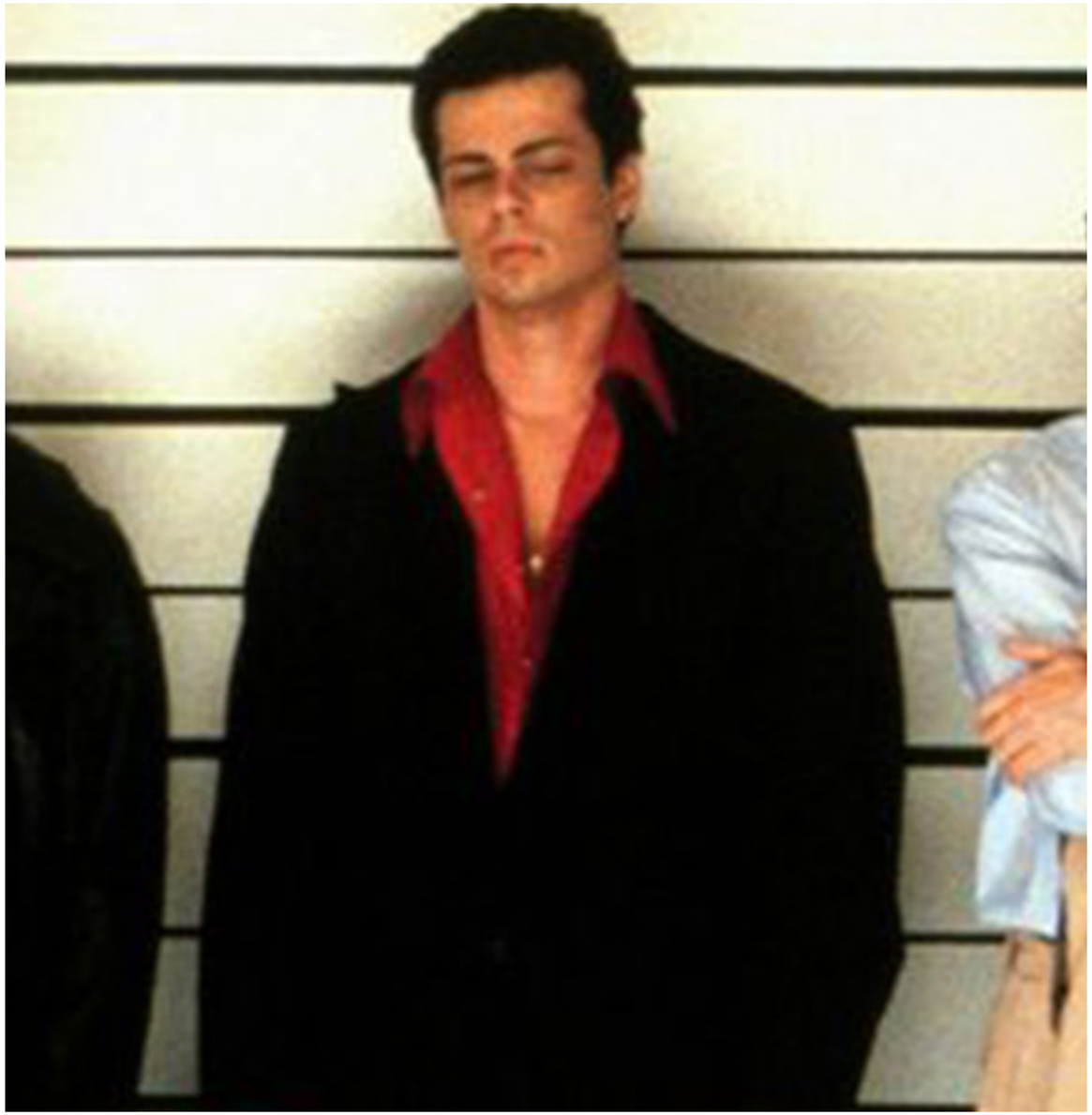
- Simple: Weather/Sensor
- Relevant: Real Data
- Portable: data only + query
- ~~Scalable (a bit): parametric query~~
- KPI: Query Coverage & Correctness



Citybench

MI Ali et al.

- Simple: Smart-City/sensor
- Relevant: Real Data, static and streaming
- ~~Portable: generation is hard-coded~~
- Scalable: query generator



StreamWatDiv

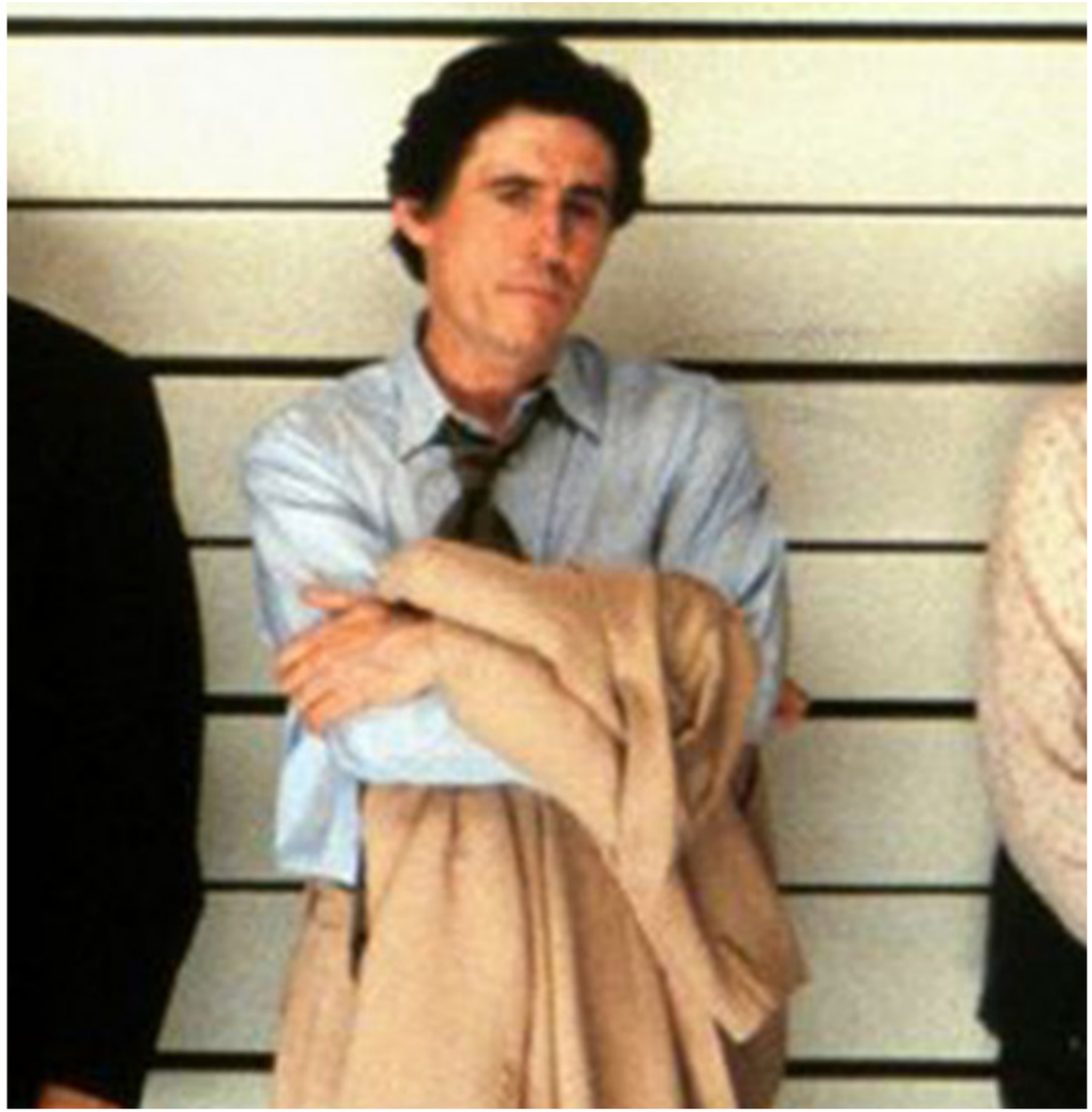
L Gao et al.

- Simple: User Activities
- Relevant: static + streaming
- Portable: test driver
- Scalable: Generator
- KPI: throughput & latency
- https://dsg.uwaterloo.ca/watdiv/stream-watdiv

DEBS Gran Challenge 2017

V Gulisano et al.

- Simple: User Activities
- Relevant: real data
- Portable: RDF
- ~~Scalable~~
- KPI: throughput



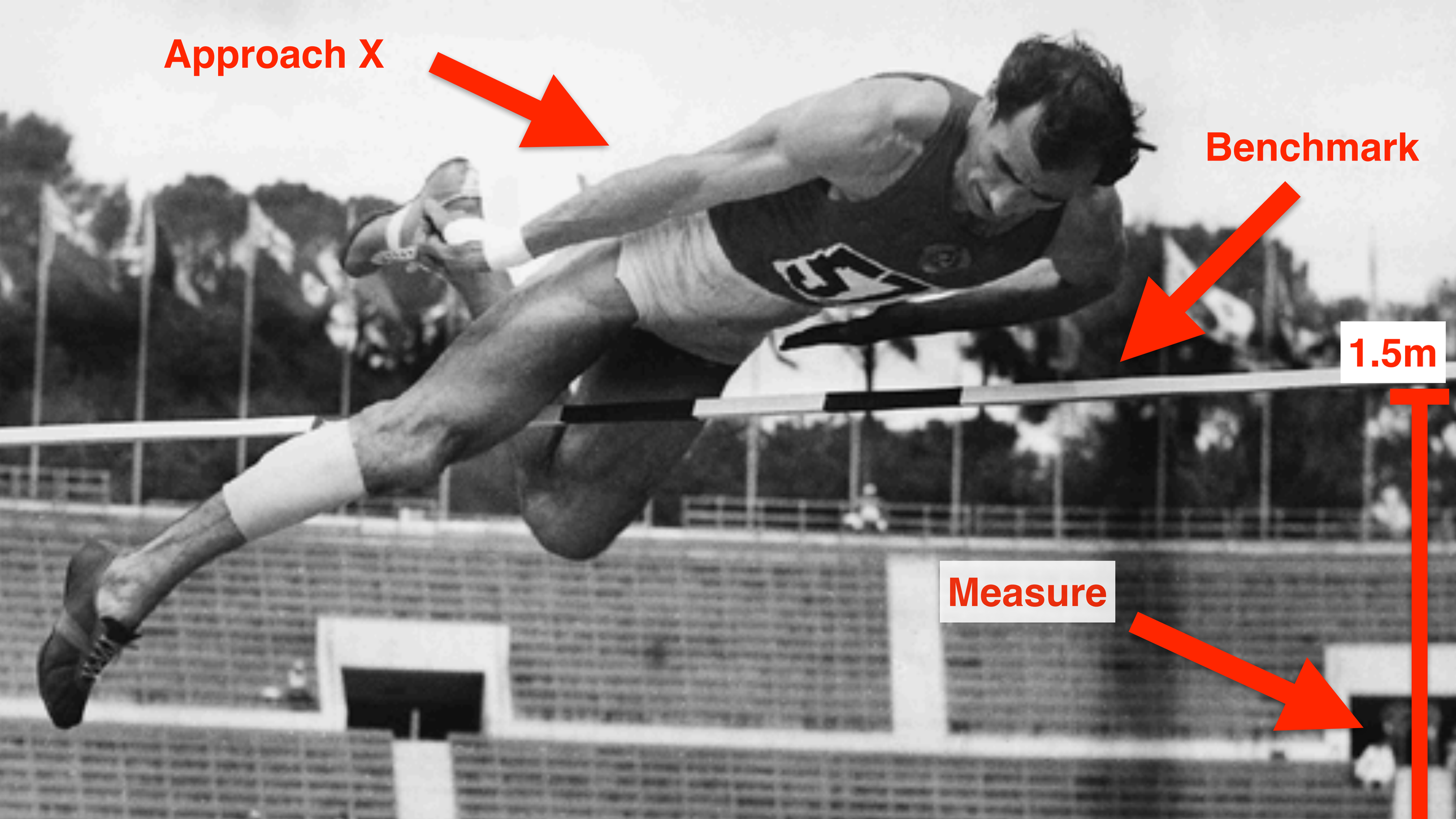
“

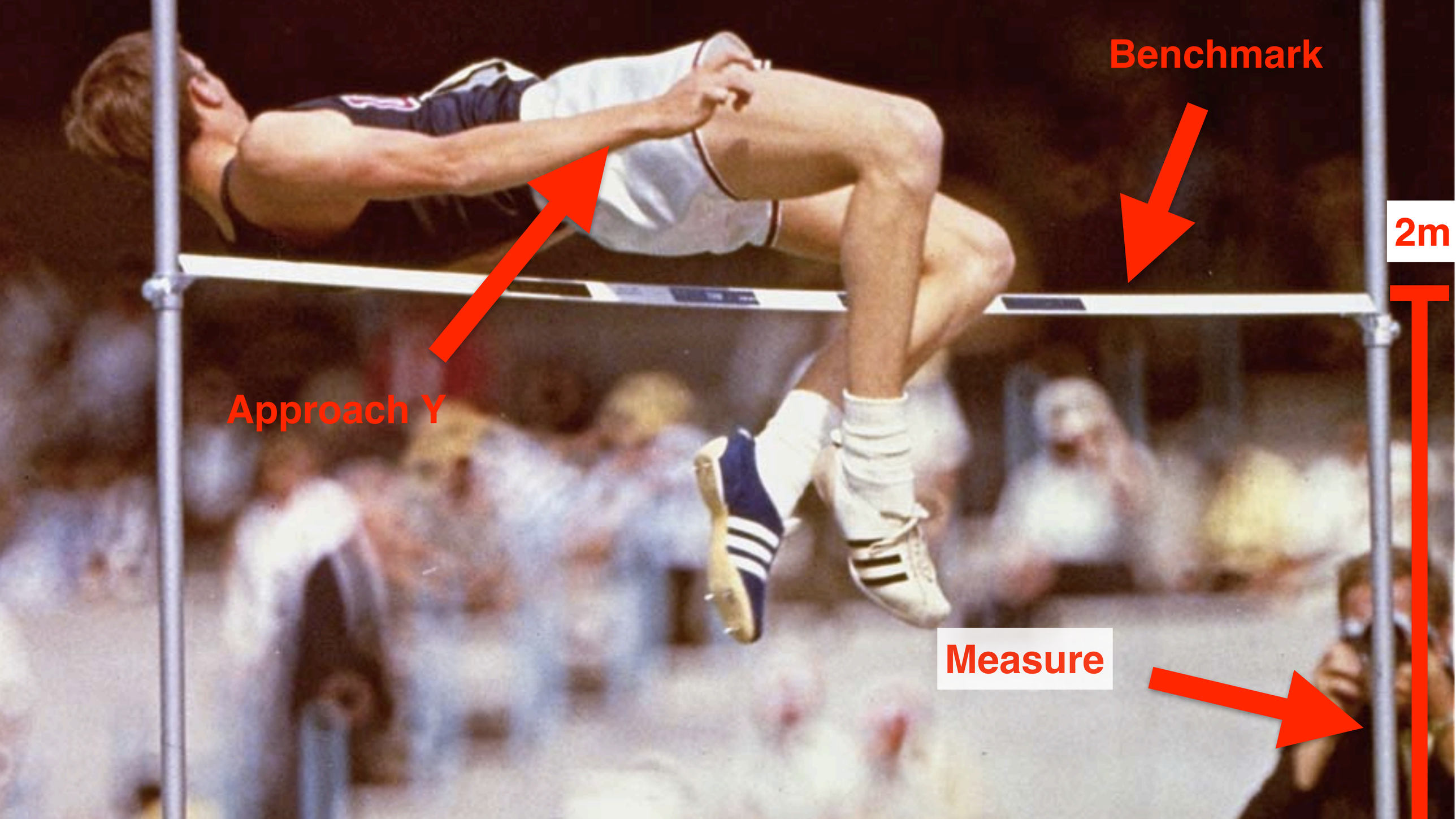
The goal of a domain specific benchmark
is to foster technological progress
by guaranteeing a fair assessment.

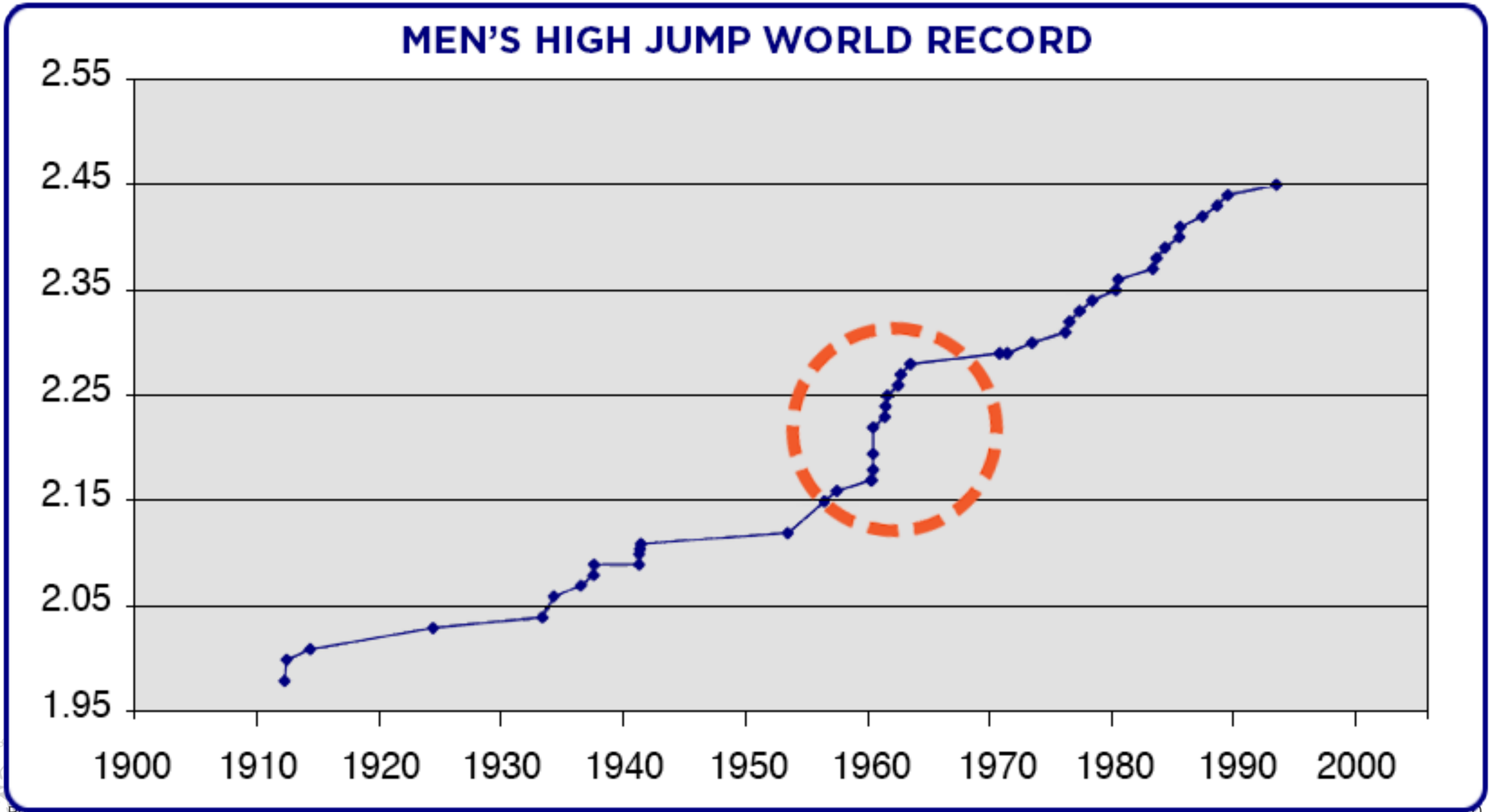
”

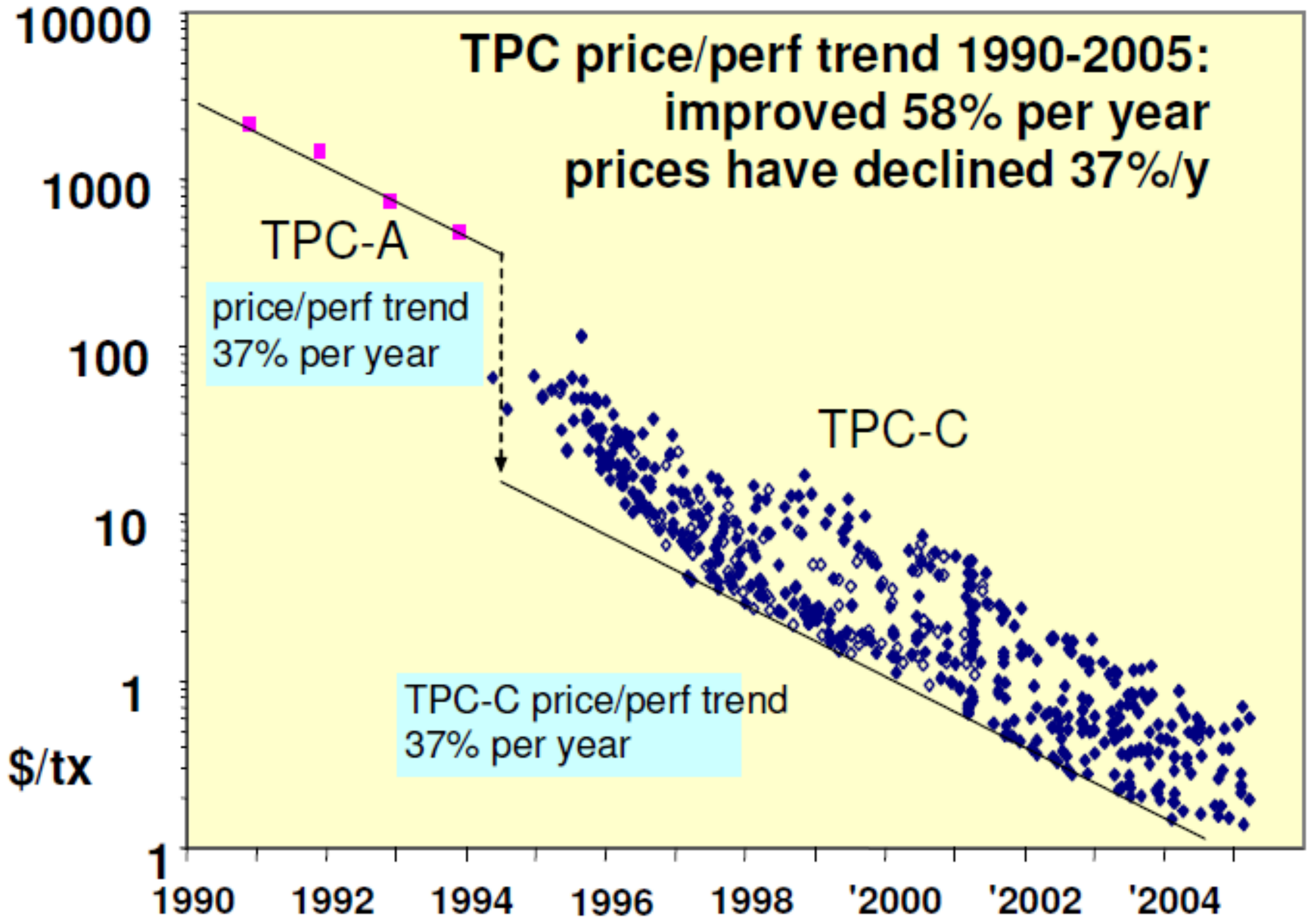
- Jim Gray, The Benchmark Handbook

for Database and Transaction Systems, 1993


Approach X
Benchmark
1.5m
Measure


Benchmark
2m
Approach Y
Measure


MEN'S HIGH JUMP WORLD RECORD
2.55
2.45
2.35
2.25
2.15
2.05
1.95
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000

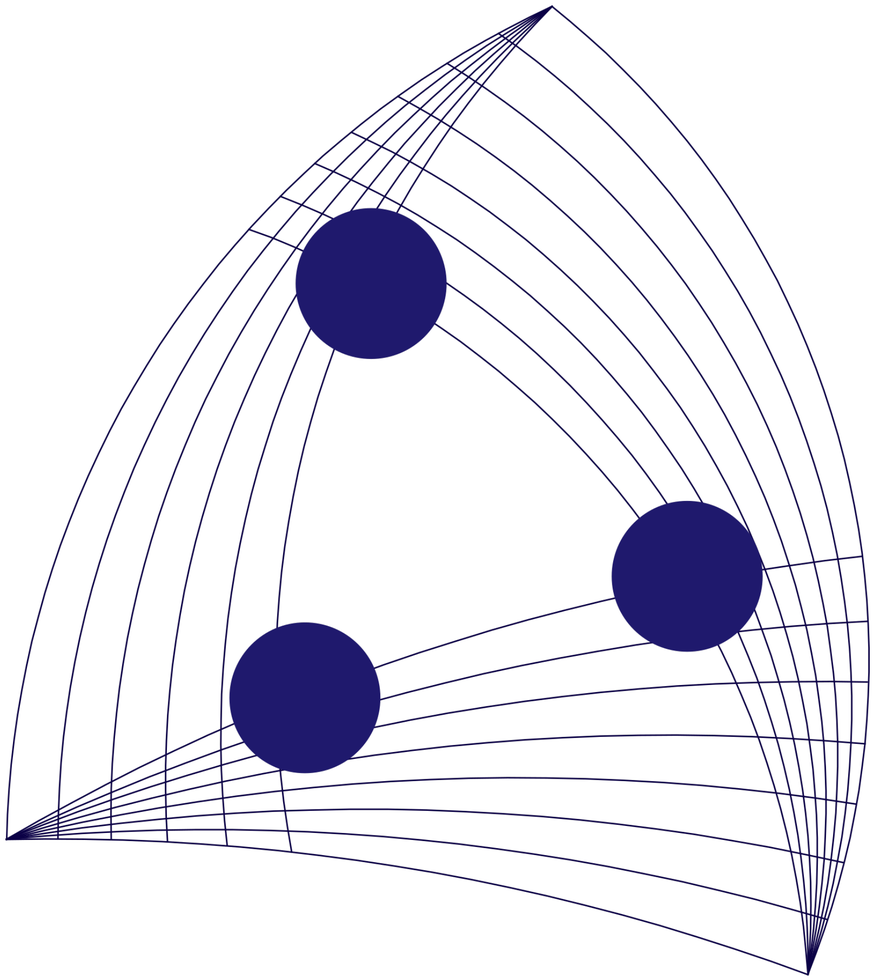


© Jim Gray, 2005

Conclusion

Edges through time

- Fast prototyping of Graph Stream Processing engines
- Potentially a test driver for benchmarks
- ESWC 2021 Best Resource Paper award!



RSPY