

# RAPIDSCAN: High-Throughput Parameterized HLS-based Streaming String-Matching Library for FPGAs

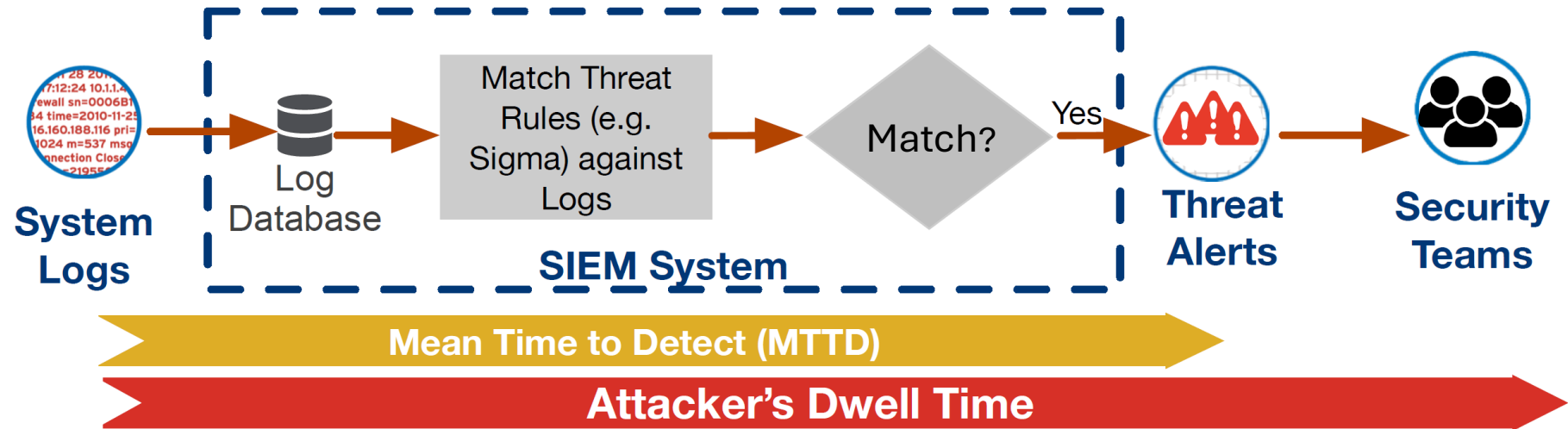
**Shashank Obla** (Carnegie Mellon University)

Tommy Tracy II (University of Virginia)

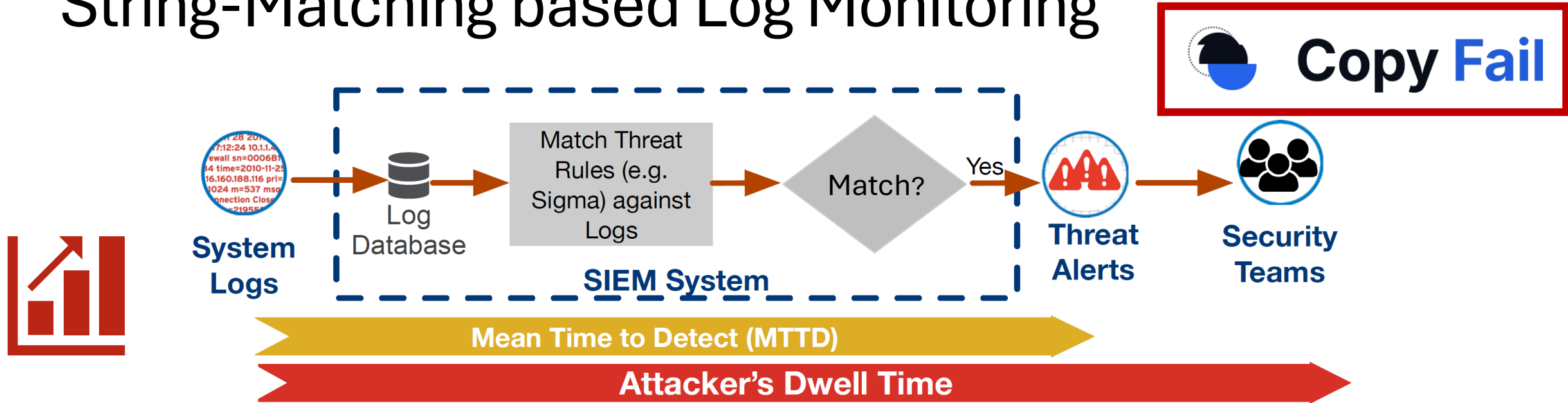
In collaboration with

James C. Hoe (CMU), Kevin Skadron (UVA) and Wajih Ul Hassan (UVA)

# Early-Warning Security Systems use String-Matching based Log Monitoring



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*Effective Threat Detection Systems must satisfy:*



Throughput

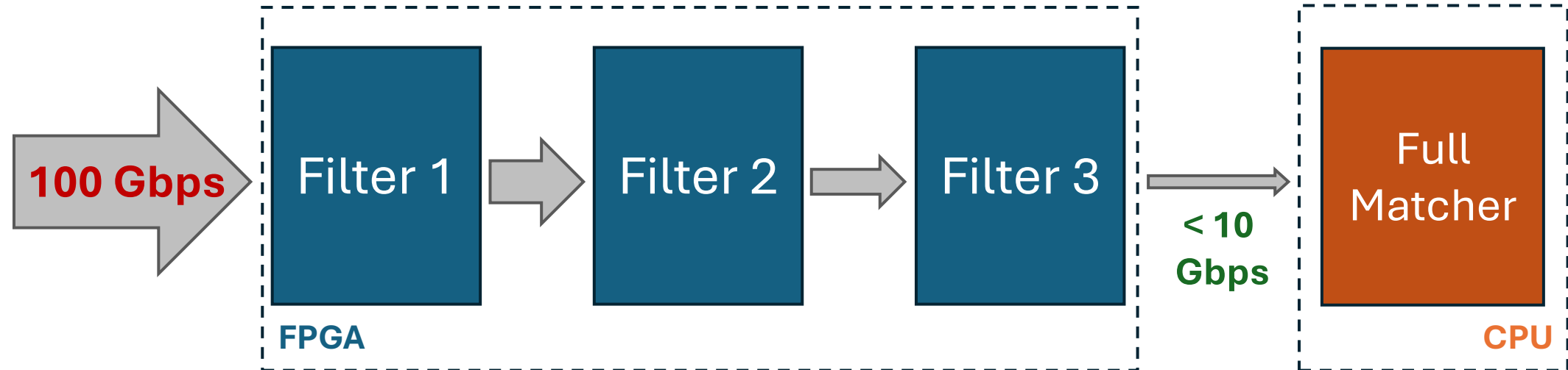


MTTD (Latency)

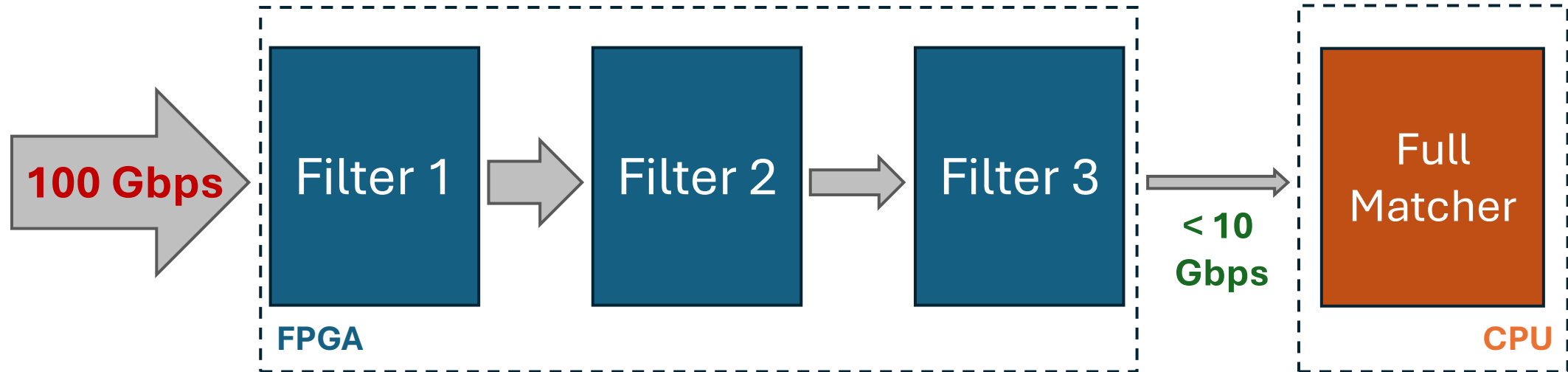


Adaptability

Existing works use FPGA as a bump-in-the-wire common-case optimized pre-filter for software



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*Input-dependence renders the RTL Design inefficient for new workloads*



Throughput



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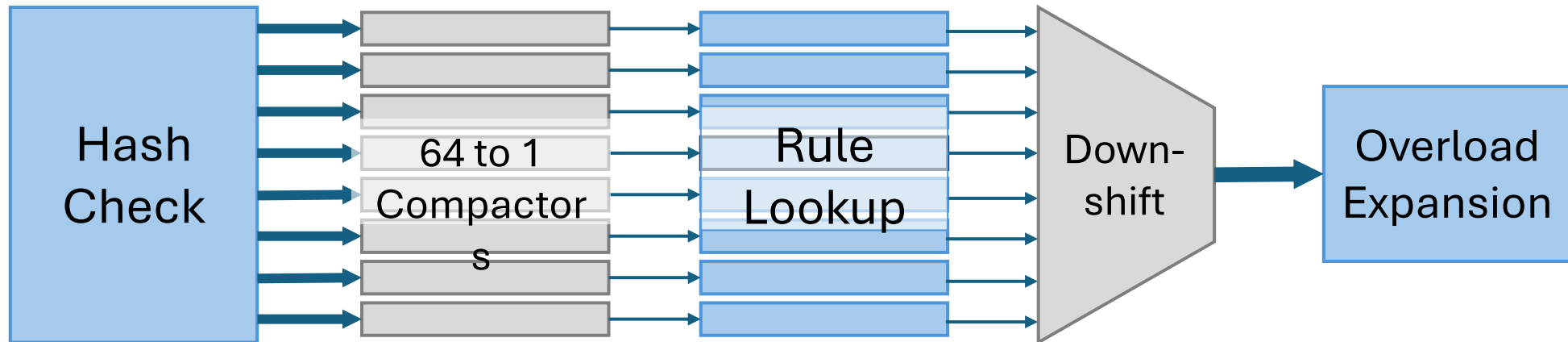
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# HLS does not like data-dependent kernels :(

Need to check >10,000 rules at 200 Gbps

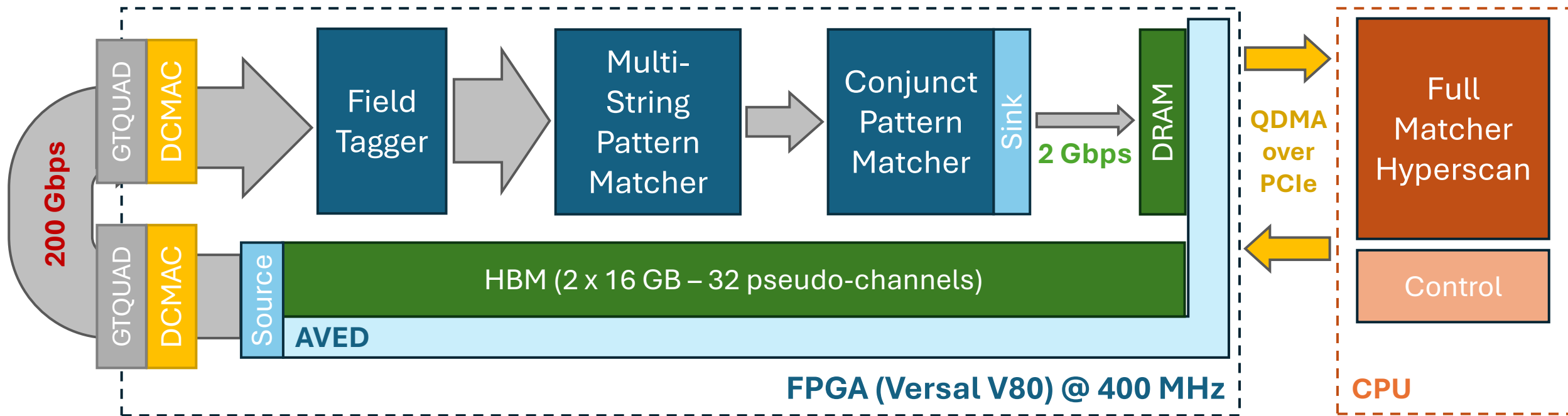
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*Play to HLS' strengths: Input-dependence is factored out into infrastructure kernels exposing parallelism in core filter computation*

# RAPIDDETECT composes RAPIDSCAN kernels for Log Monitoring achieving 200 Gbps on a single server!



Throughput



MTTD (Latency)



Adaptability

RAPIDDETECT on V80 is open-sourced!

Use it for your *string-matching* needs or  
as a *real-world benchmark* for stress  
testing HLS toolflows

Come find me at Demo Night!



<https://github.com/pigamus-hls/RapidDetect-RCC>