Virtually Aged Sampling DMR
Unifying Circuit Failure Prediction and Detection

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A gate fails, causes errors
Can we predict the failure?
A gate fails, causes errors
Virtually Aged Sampling DMR

Virtual Aging

Time (years)

Today

Virtual Age

Fault Exposure

A gate fails, causes errors

Applications
Virtually Aged Sampling DMR

Virtual Aging

Time (years)

Today

Virtual Age

Fault Exposure

A gate fails, causes errors

Applications

Detect Errors

Sampling - DMR is active

Checked Core (Virtually Aged)

Checker Core
Virtually Aged Sampling DMR

μ-Processor Failure Prediction Technique
Virtually Aged Sampling DMR

μ-Processor Failure Prediction Technique

Comprehensive Coverage
Virtually Aged Sampling DMR

- μ-Processor Failure Prediction Technique
- Comprehensive Coverage
- No Performance Overhead
- Less than 0.7 % Energy Overhead
Virtually Aged Sampling DMR

- μ-Processor Failure Prediction Technique
- Comprehensive Coverage
- No Performance Overhead
- Less than 0.7 % Energy Overhead
- Today @ 3:30PM Alpha Gamma Rho