Can Machine Learning for RDC perform as well as a user in generating a set of suggested constraints? Study looked at performance, noise and RDC results to determine effectiveness and accuracy of ML versus hand generated constraints

Reference design:
- 10 million state bits, 3 clock groups, 8 reset groups
- 90K RDC paths, utilizing various RDC mitigation strategies

Design chosen had already undergone RDC verification, so valid user-constraints already existed

RDC ML flow generates suggestions for RDC constraints:
- Various constraint types
- Example RDC paths
- Total affected RDC paths
- Constraint syntax

Baseline design created by removing all RDC constraints and running analysis in Questa RDC:
- 10000+ RDC Violations

ML constraint suggestions for baseline design:
- 9 reset ordering constraints
- 1 reset grouping constraint
- 14 clock isolation constraints

Applying ML reset ordering constraints to design:
- 440 RDC violations compared to 10000 from baseline

Applying clock isolation constraints:
- 4436 crossings affected compared to 4446 with hand-generated constraints

Applying a mix of user reset ordering constraints and ML clock isolation constraints:
- 221 RDC violations compared to 10000 from baseline

Combined User constraints + ML constraints yield very good results:
- RDC paths from 1000's to hundreds with minimal effort

RDC ML performance:
- No noticeable runtime or memory impact

REFERENCES

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