Hardness amplification for weakly verifiable cryptographic primitives

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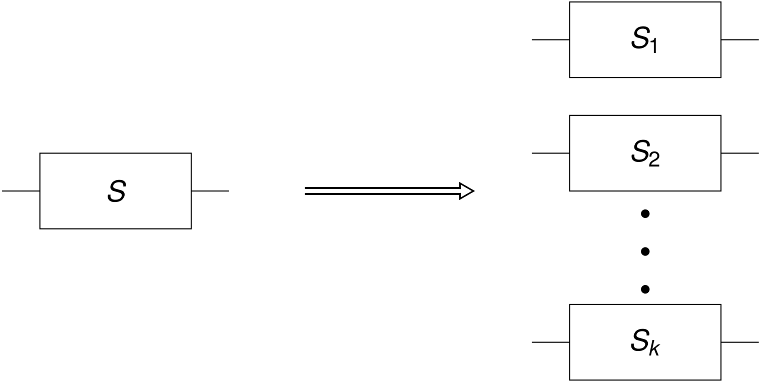
Agenda

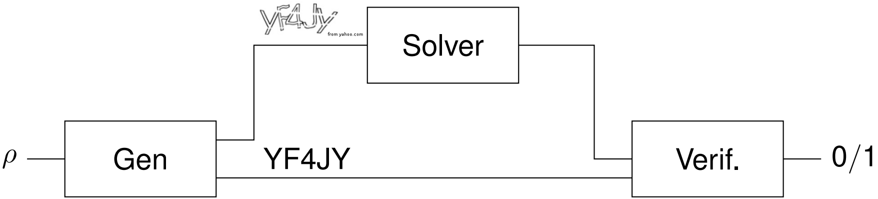
- Motivation and problem statement
- Background and related work
- My contribution
- Results
- Discussion

Hardness Amplification

Is solving parallel repetition of problems substantially harder than a single instance of a problem?



Weakly Verifiable Puzzles - CAPTCHA



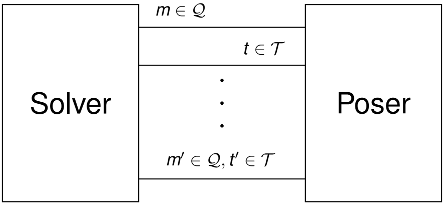
Assumptions

- Small solutions space.
- Solver cannot have a way to efficiently verify its solutions.

Weakly Verifiable Puzzles

- Introduces by Cannetti, Halevi, Steiner [CHS05]
- An algorithm G generates a puzzle p together with some secrecy information s.
- A solver given p has to find a correct solution.
- It is hard for the solver to verify the correctness of a solution given only p.
- A verification algorithm has access to s which makes the task of checking the correctness of a solution easy.

Dynamic Puzzles Definition (Informal)



Interactive Cryptographic Primitives

Previous work of Cannetti, Halevi, and Steiner

Previous work DIJK

Previous work HS

My contribution I

My contribution II

Discussion

Questions

Bibliography

Ran Canetti, Shai Halevi, and Michael Steiner.
Hardness amplification of weakly verifiable puzzles.
In *Theory of Cryptography*, pages 17–33. Springer, 2005.