Secure remote activation scheme for integrated circuits

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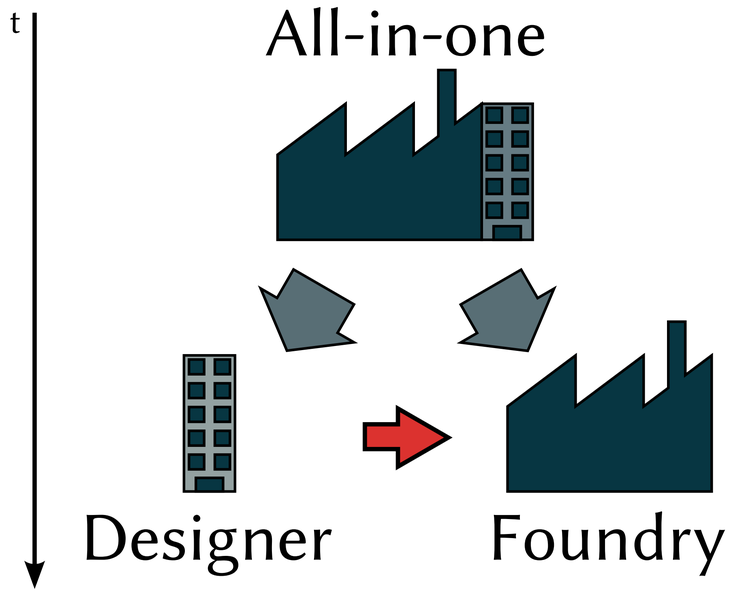


Problem

Once the design is provided to the foundry, the designer cannot control **how many** copies are produced.

~10% of the electronics market is counterfeit **(>$20 billion)**

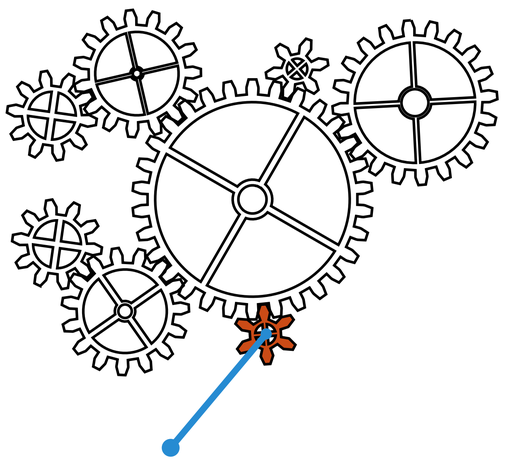
Proposed solution

• The design is modified to make the produced circuit **locked.**

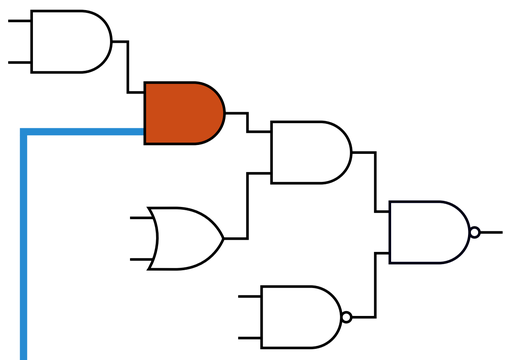
• After production, each circuit must be **individually unlocked** by the original designer who sends a **unique activation key**.

Make the design **lockable**

Gears



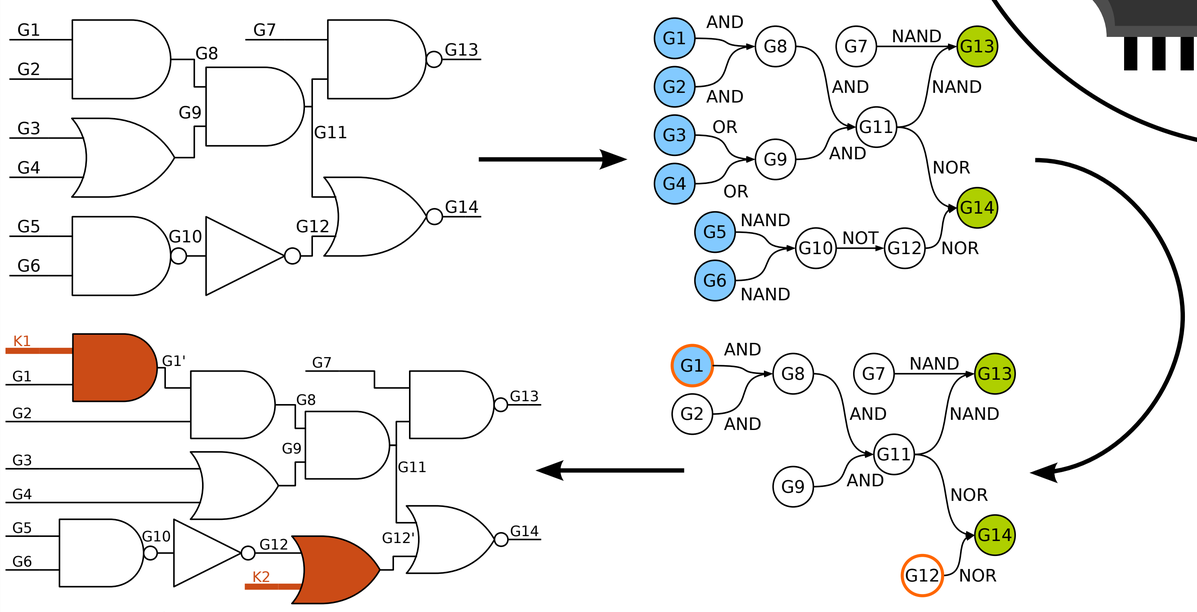
Logic gates



Existing parts
Added, controllable parts
Controller

Force the outputs to a fixed value

Insertion algorithm:

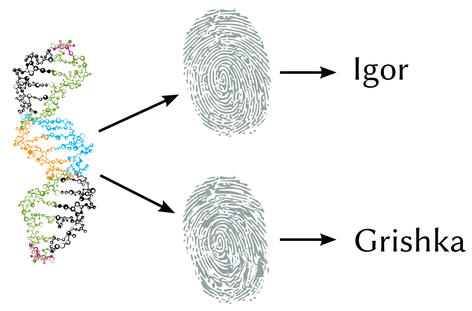


Results:

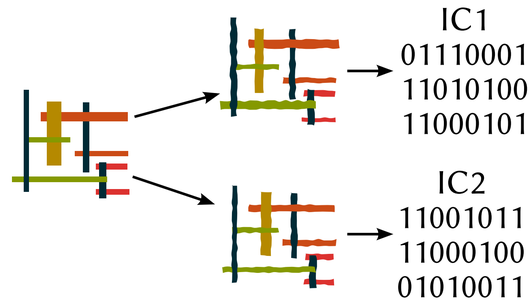
- Only 3% area overhead on average,
- 10000x faster than existing insertion algorithms.

Make the design **uniquely identifiable**

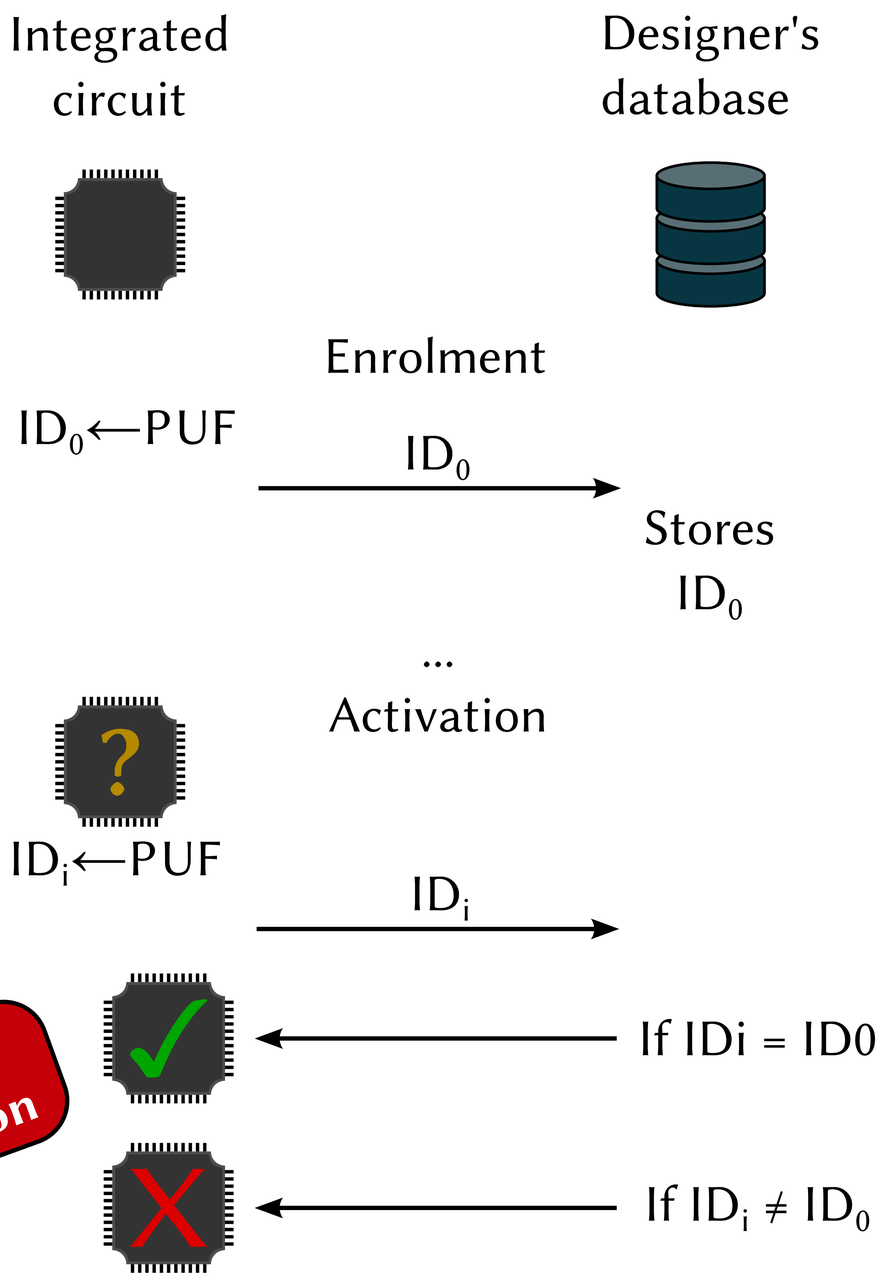
Fingerprint for twins



PUFs for ICs



Extract a unique ID from random physical variations



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