Resistance of Threshold Implementations against Statistical Ineffective Fault Attacks

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Journée de la Recherche

joint work with Vincent Grosso and Pierre-Louis Cayrel

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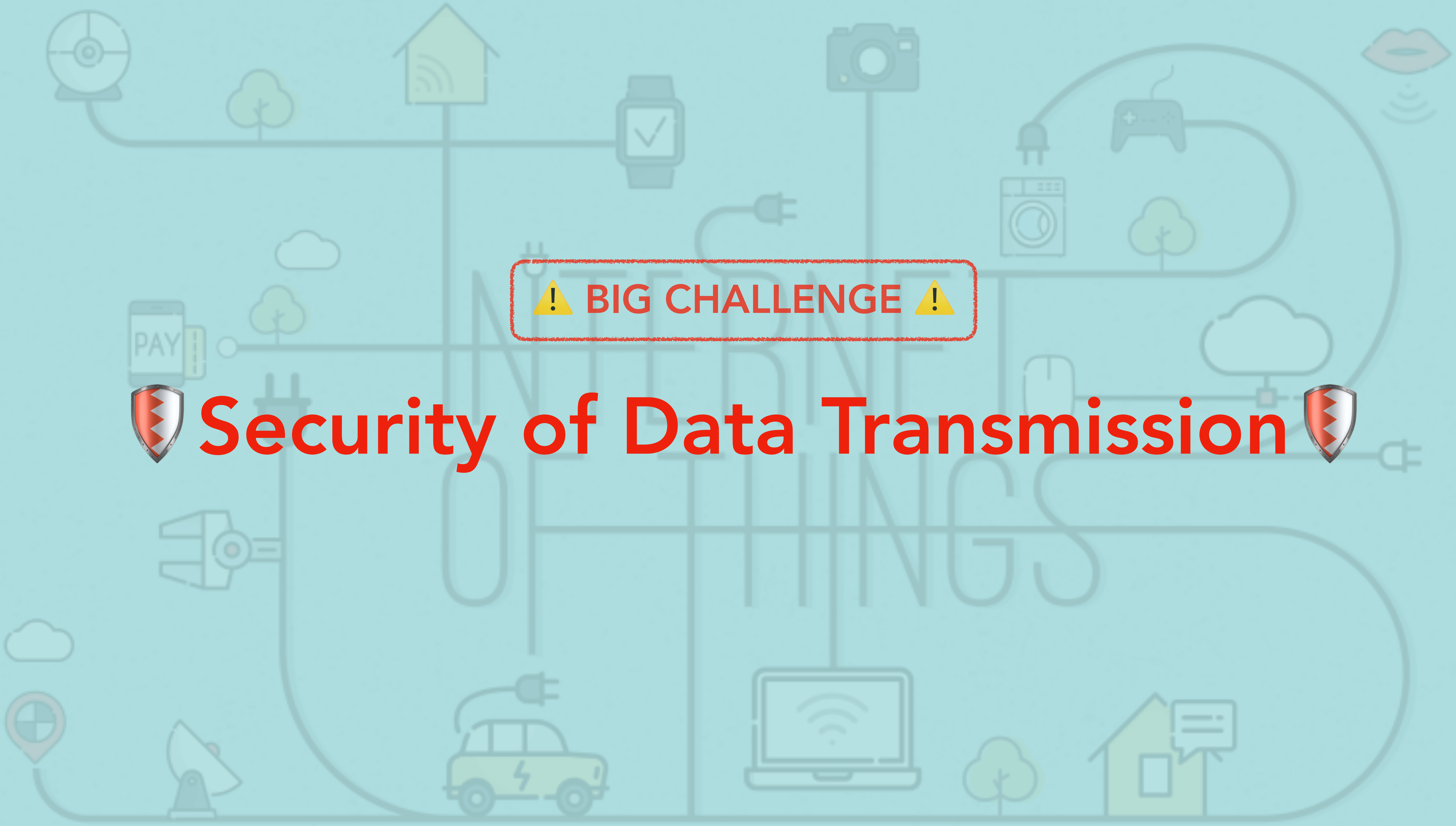

⚠️ BIG CHALLENGE ⚠️

🛡️ Security of Data Transmission 🛡️

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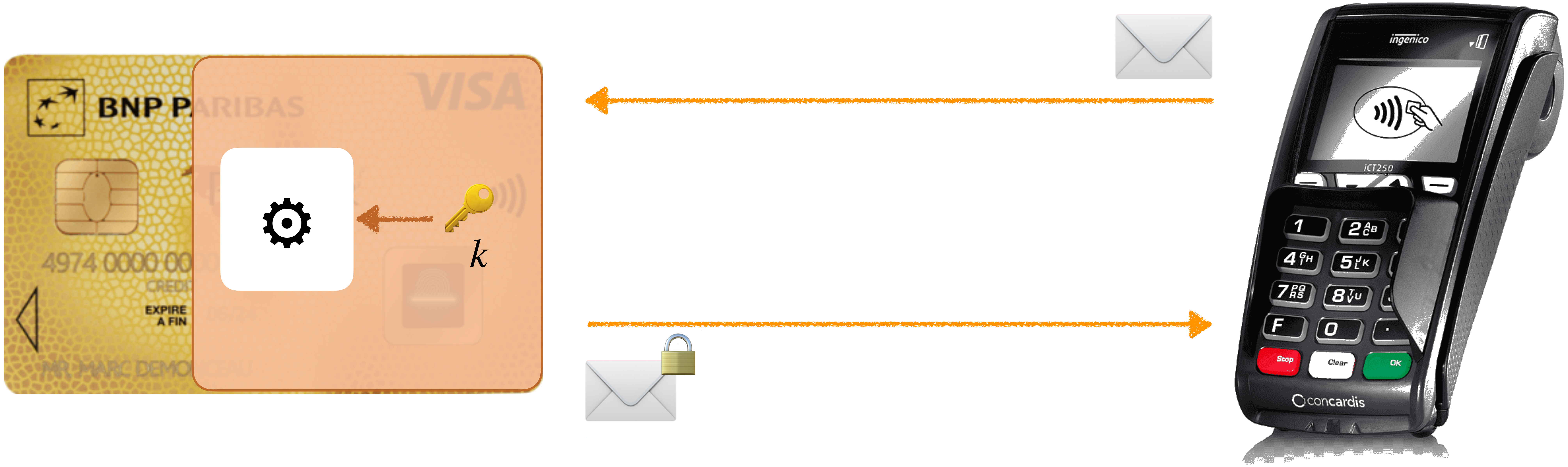
Payment Example



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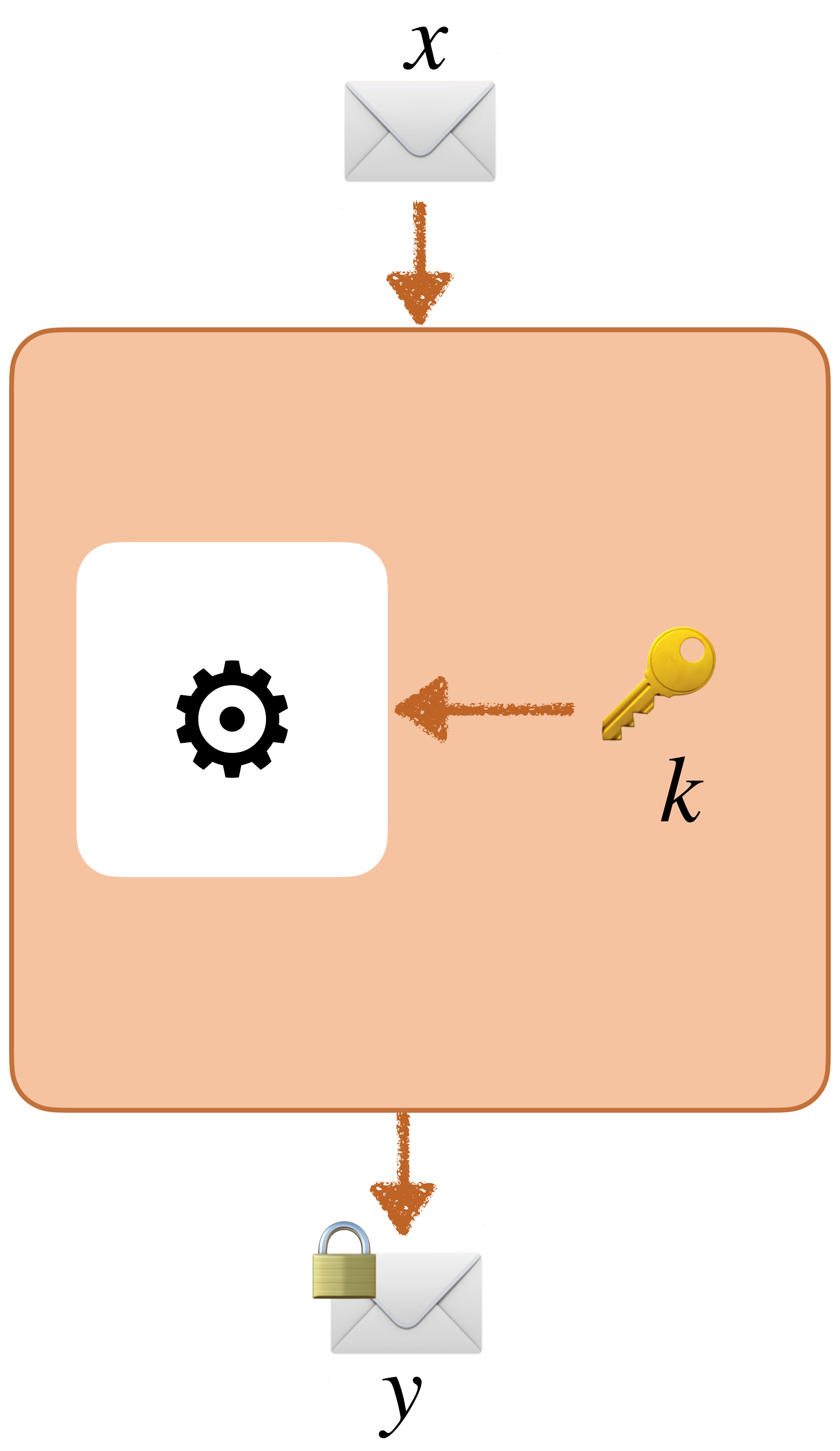
Cryptography



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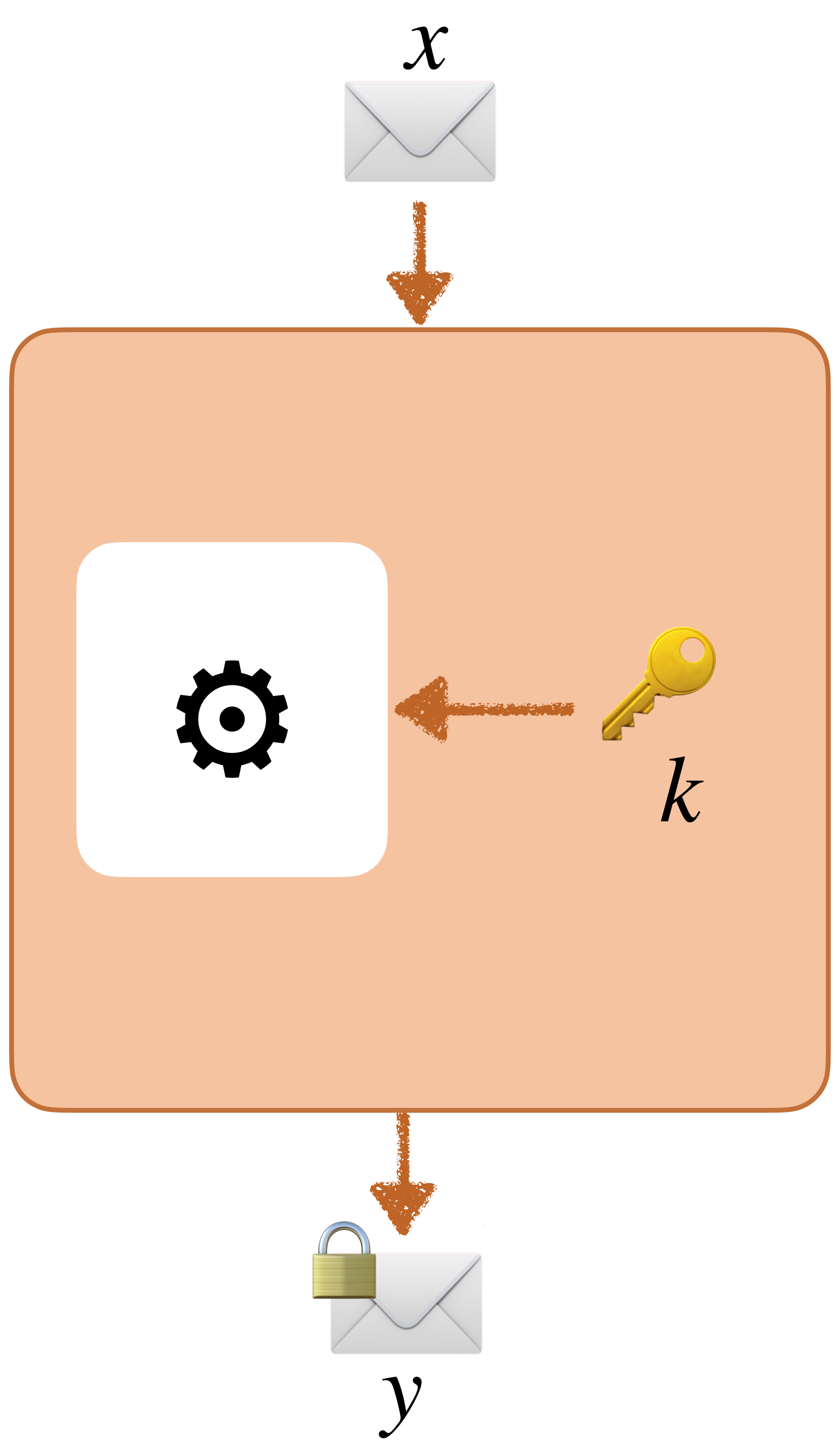
Battle… here it comes!



Attacker

Designer

“I steal the key 🔑”

“I protect the key 🔑”

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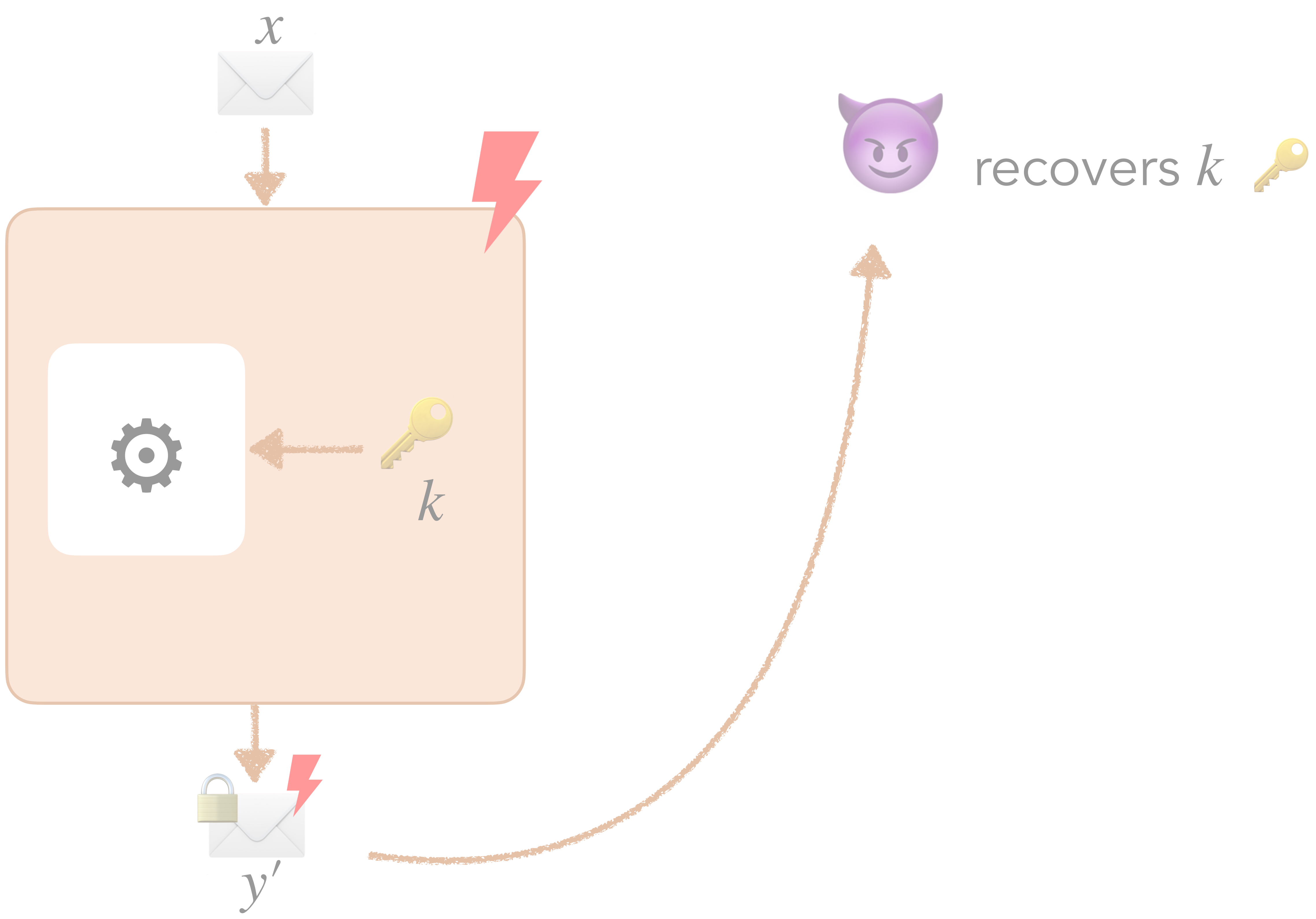
"I have fault attacks"



x

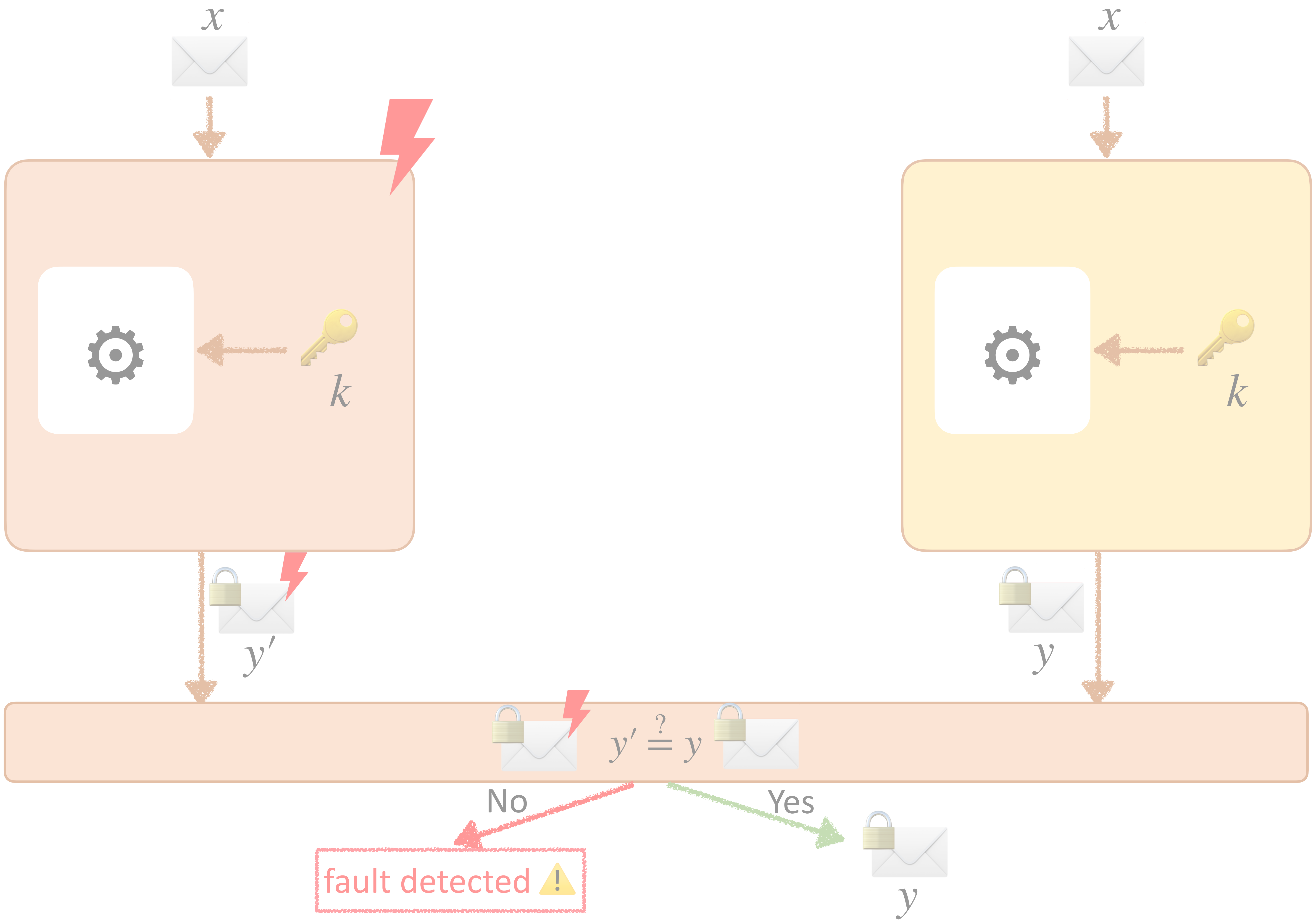
k

y'

recovers k

…

“I have countermeasure”



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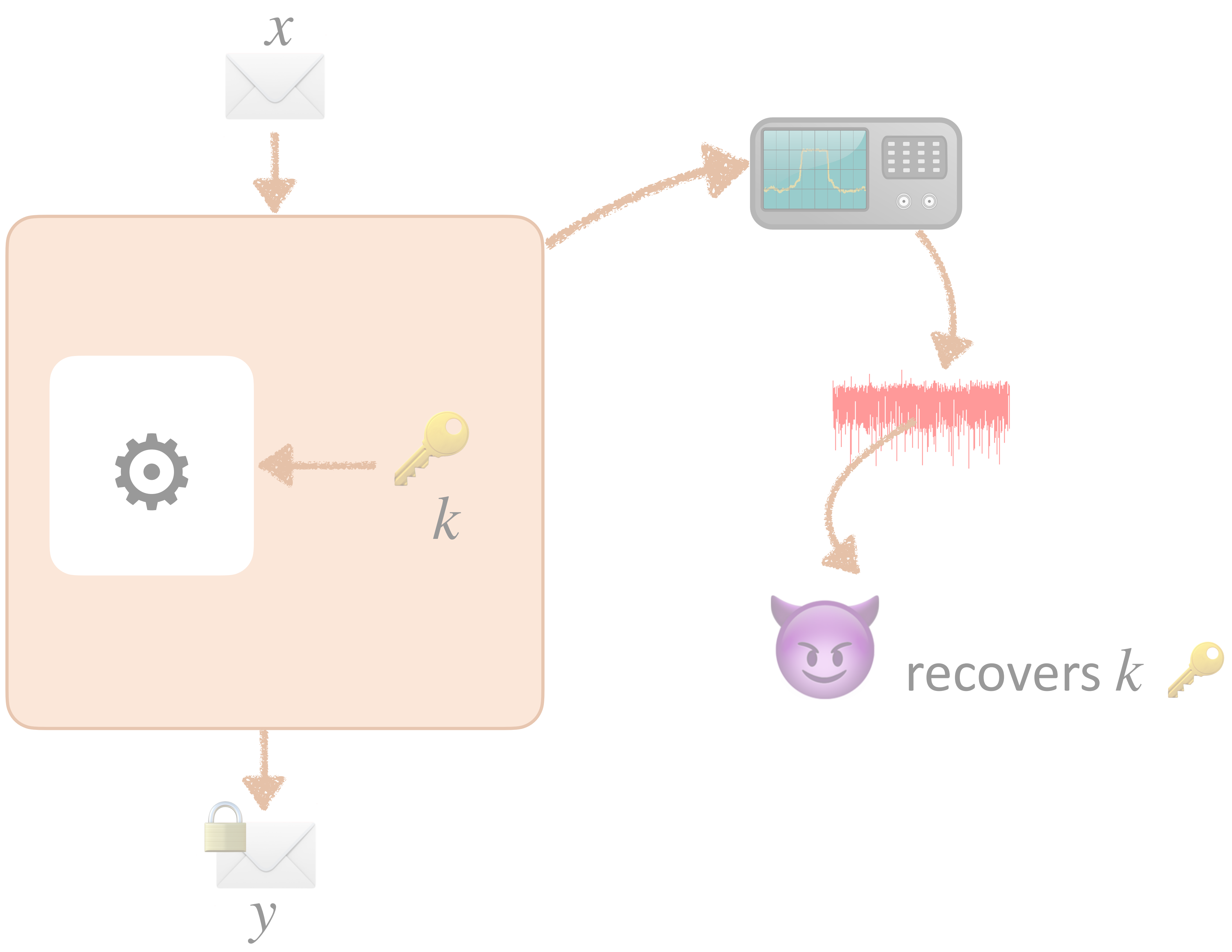
"I have side-channel attacks"



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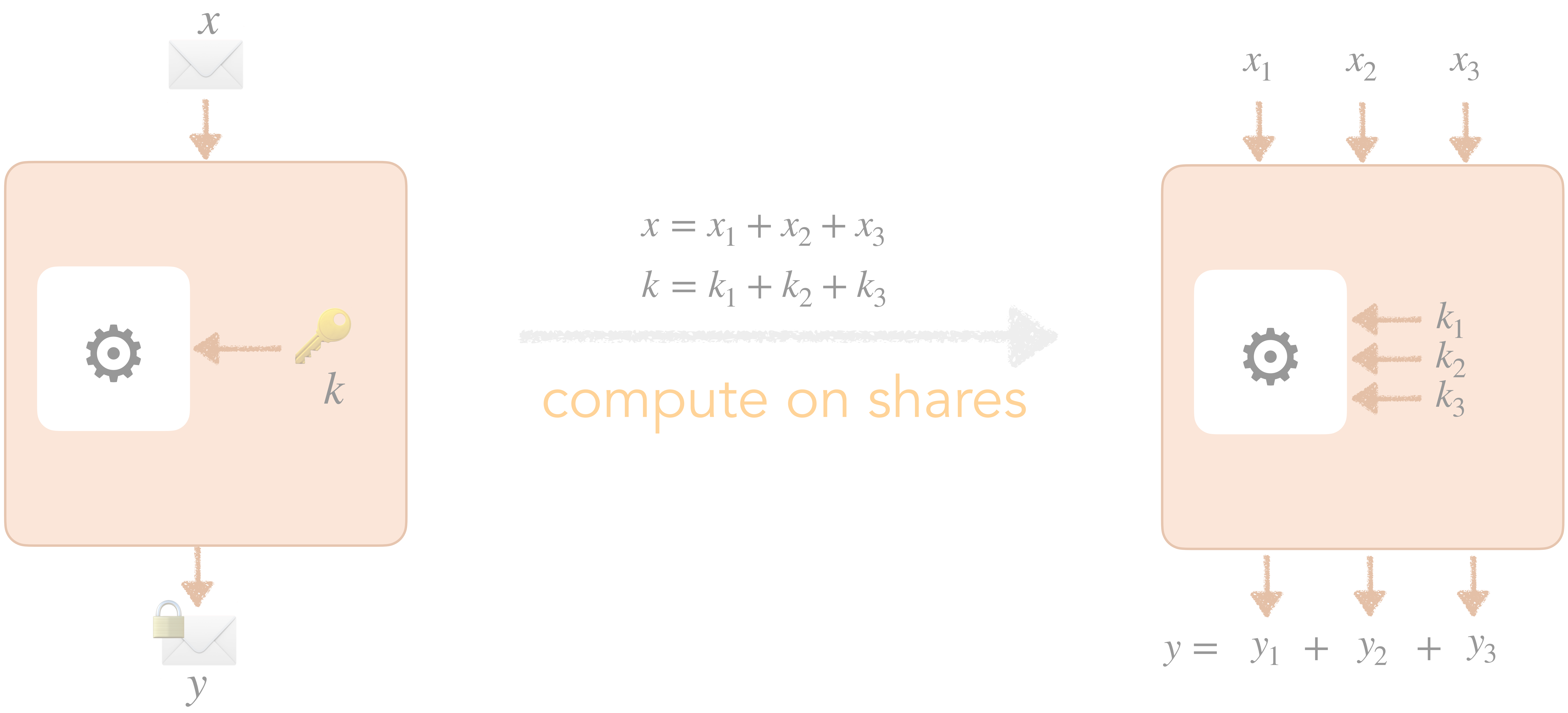
...

“I have countermeasure”



$$x = x_1 + x_2 + x_3$$

$$k = k_1 + k_2 + k_3$$

compute on shares

$$y = y_1 + y_2 + y_3$$

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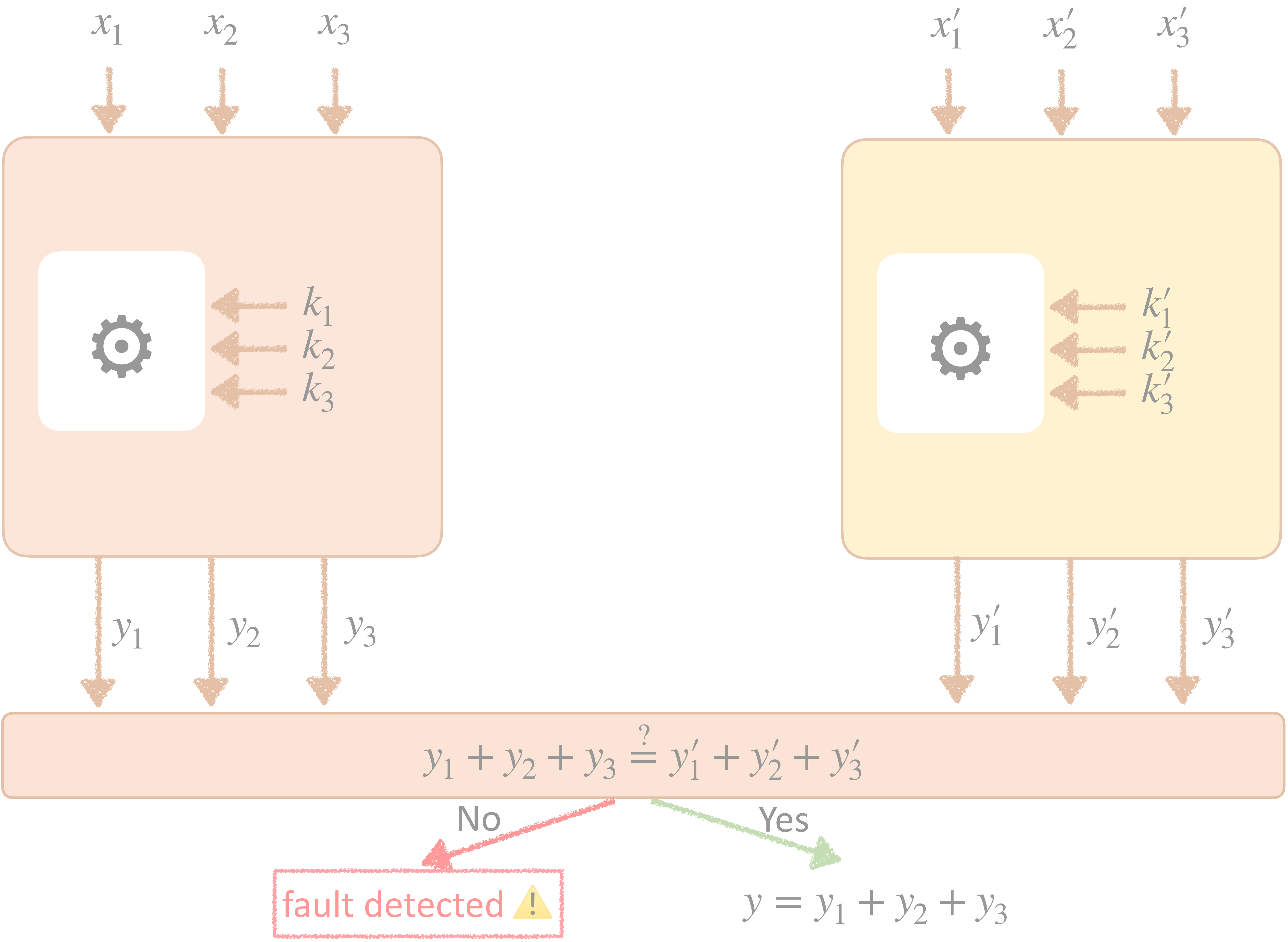
“This is combined countermeasure” 😇



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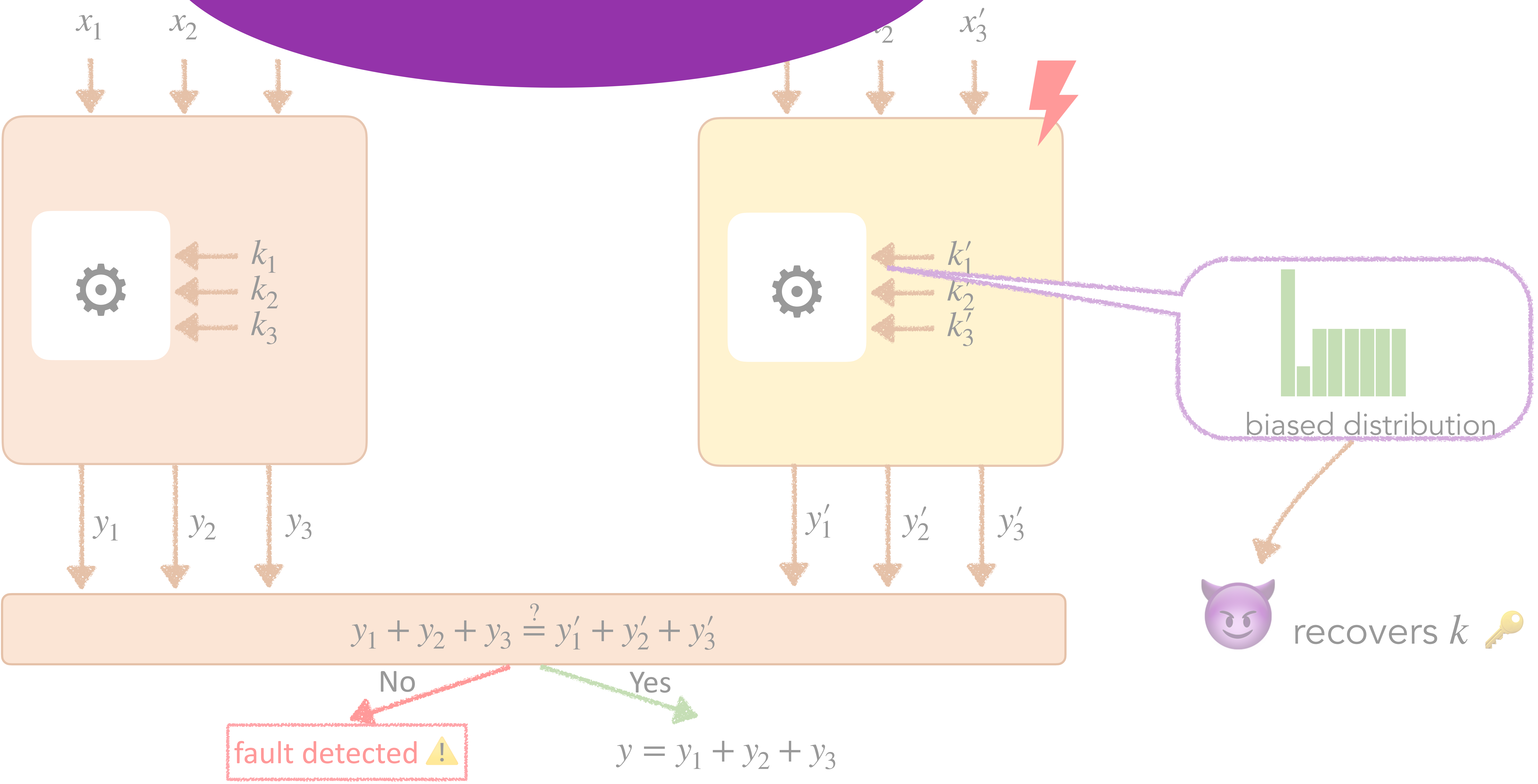
“I have stronger attack”

d countermeasure”

“This is state-of-the-art. Haha”



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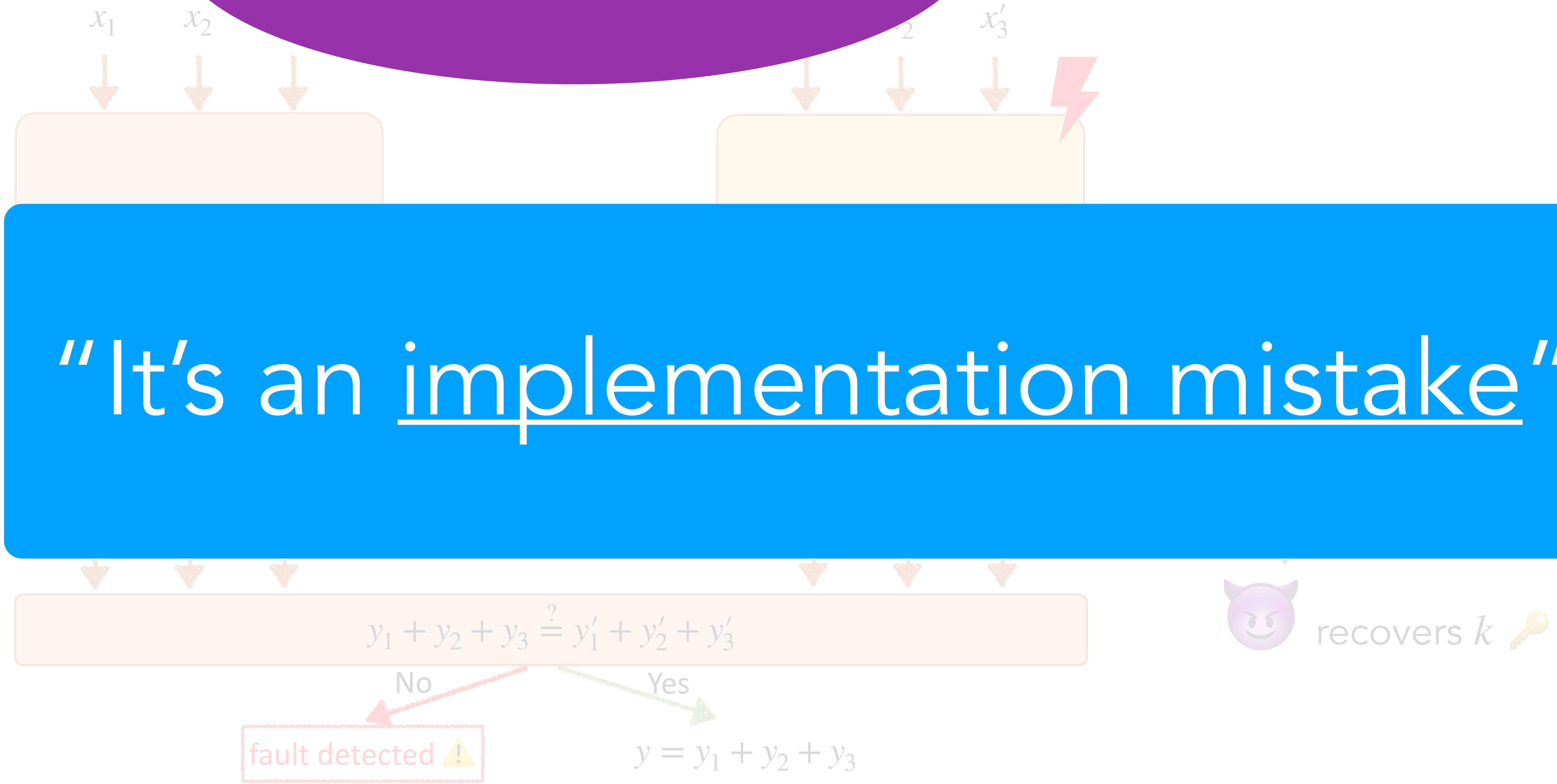
“I have str

“I know the reason”

“This is state-of-the-art. Haha”



“It’s an <u>implementation mistake</u>”

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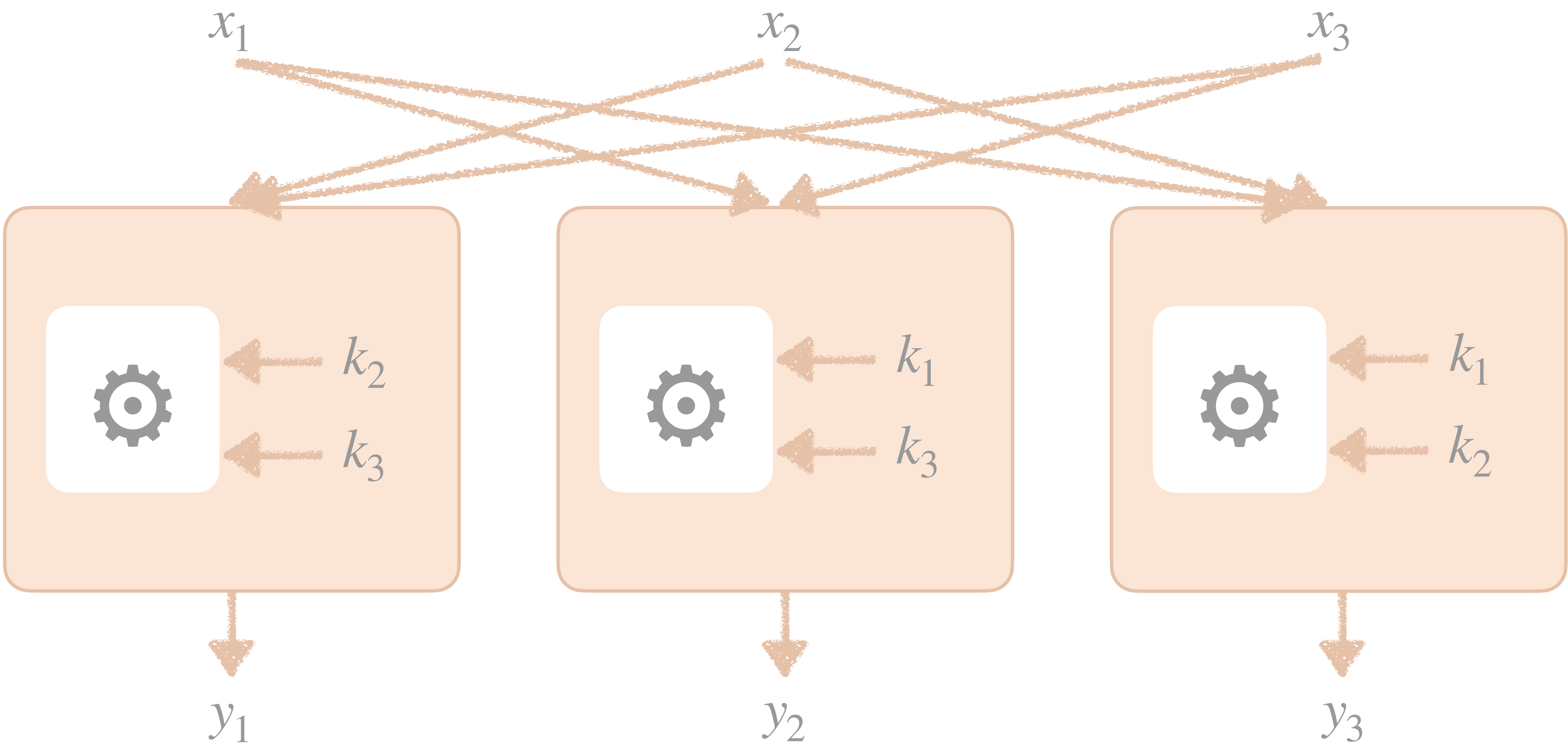
“I have str

“I know the reason”

“This is state-o

“I have countermeasure.
Let’s implement it properly!”



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😈

“I have str

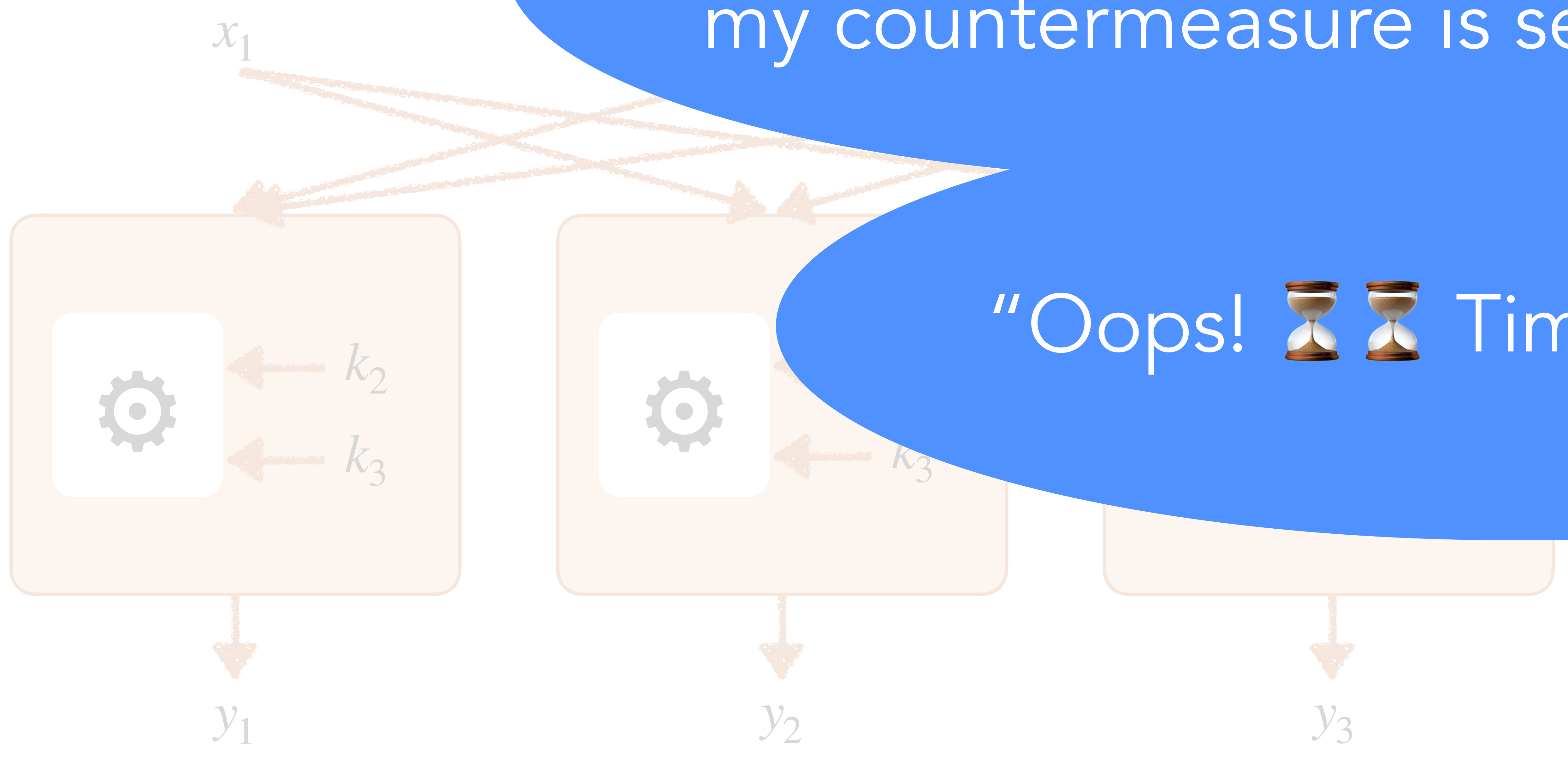
“This is state-o

“I know the reason”

“I have countermeasure.
Let’s implement it properly!”

“I can prove that
my countermeasure is secure”

“Oops! ⏳⏳ Time’s up! ⏰⏰”



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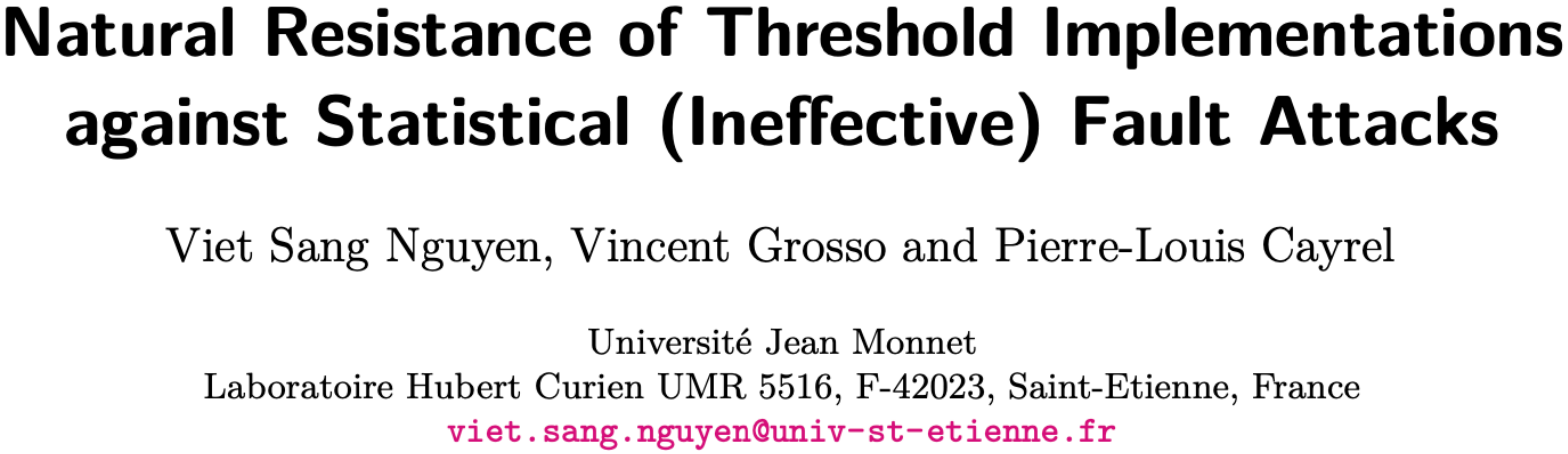
“You want to know more?
contact me 😉”

THANK YOU!



Natural Resistance of Threshold Implementations against Statistical (Ineffective) Fault Attacks

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