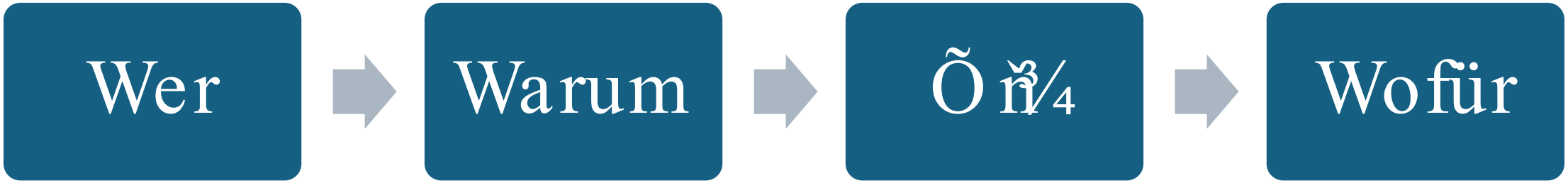
Radio Key Generation

Wie man symmetrische Schlüssel aus Funkkanaleigenschaften generiert

Jakob Heigl-Auer

Inhalt



Wer (hat daran gearbeitet)

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Warum


Forbes
Are We Ready For Post-Quantum Cryptography?


built in
Cryptographers Are Racing Against Quantum Computers
Today's security schemes will soon be obsolete.


DIGITAL JOURNAL
Quantum dilemma: Cybersecurity risks are accelerating

Warum

[1] *Dr. Dilip Kumar Yadav Sandeep Kumar Rao Dindayal Mahto, „The AES-256 Cryptosystem Resists Quantum Attacks“, International Journal of Advanced Research in Computer Science, Jg. 8, Nr. 3, S. 404–408, Apr. 2017. DOI: 10 . 26483 / ijarcs . v8i3 . 3025.*

Warum

$256\text{Bit} \rightarrow 128\text{Bit}$ [1]

[1] *Dr. Dilip Kumar Yadav Sandeep Kumar Rao Dindayal Mahto, „The AES-256 Cryptosystem Resists Quantum Attacks“, International Journal of Advanced Research in Computer Science, Jg. 8, Nr. 3, S. 404–408, Apr. 2017. DOI: 10 . 26483 / ijarcs . v8i3 . 3025.*

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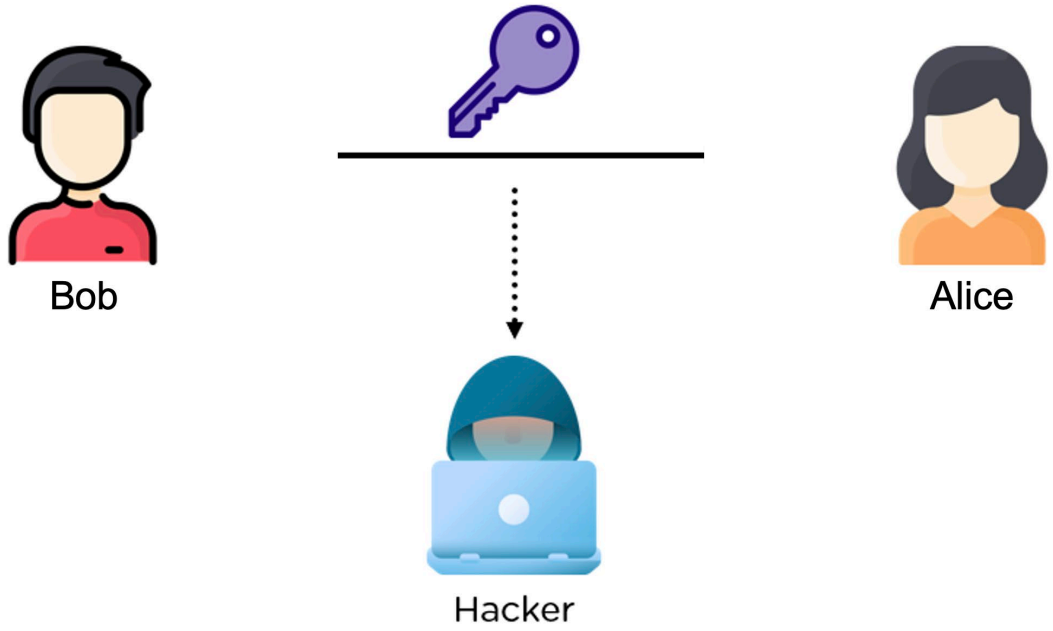

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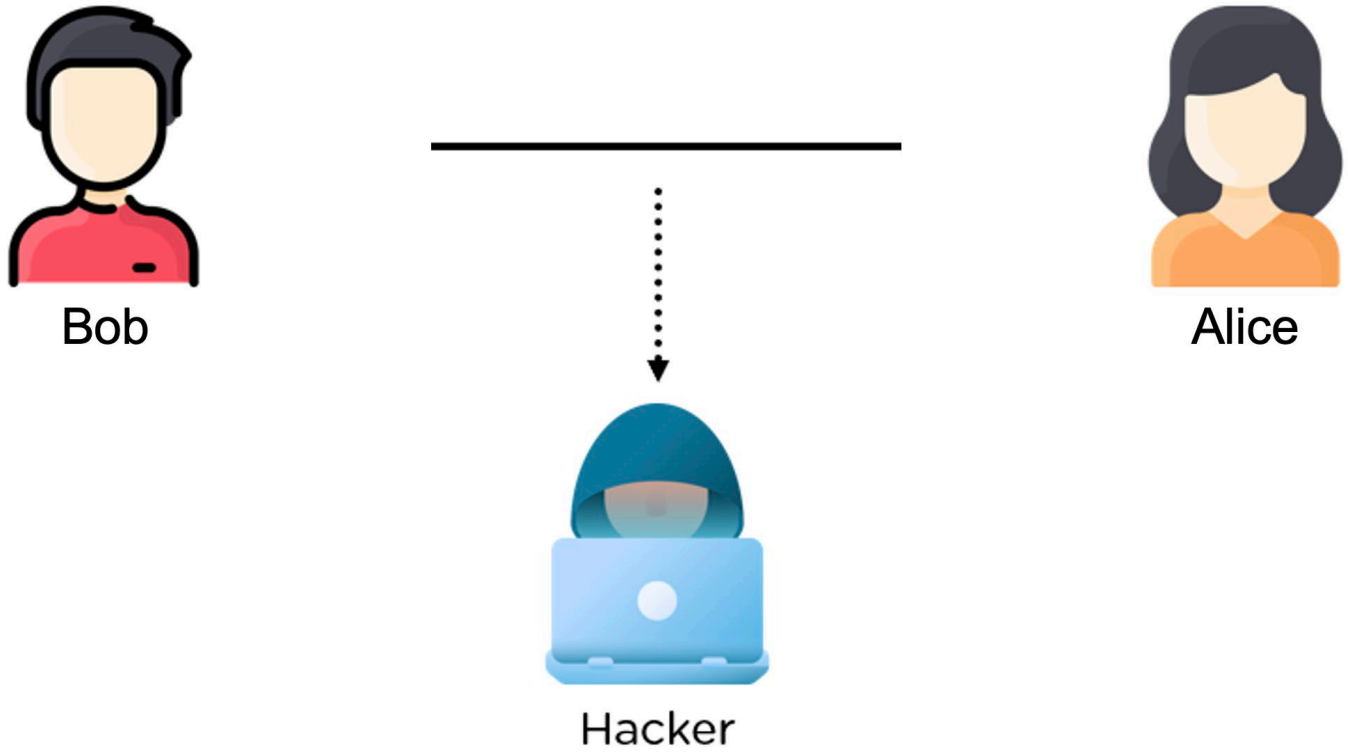

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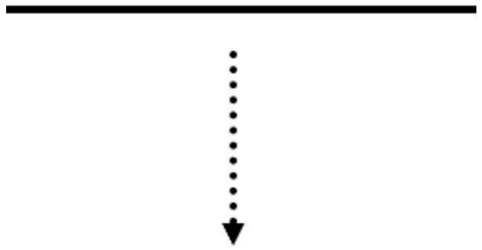


Wie

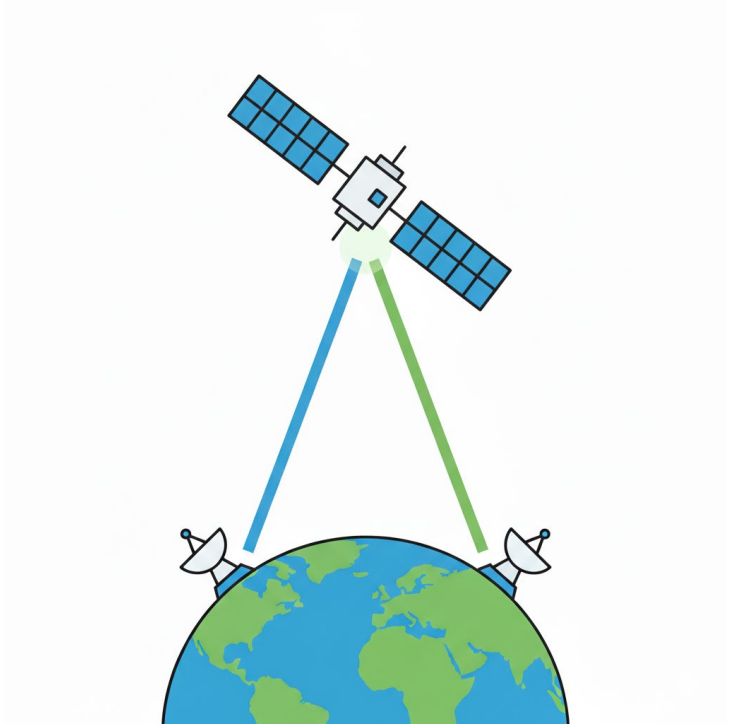
Reziproke Kanaleigenschaften:

- Signalstärke
- Phasenwinkel
- Reflektionen / Multipath Propagation
- Laufzeit
- Uvm.

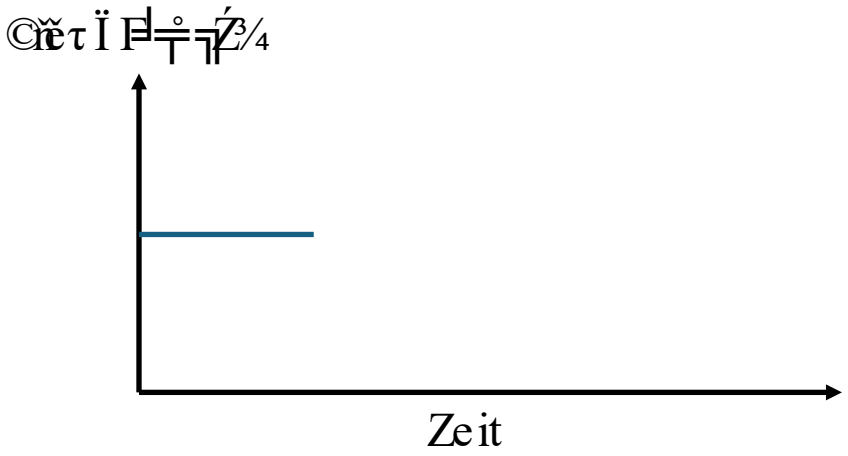
Dynamik:

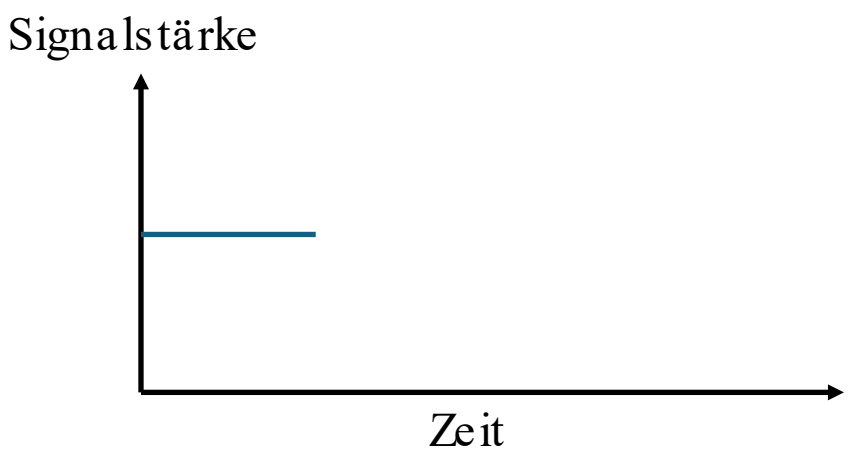
- Satellitenumlauf
- Antennenbewegung
- Reflektoränderung
- Fortbewegung (gehen, fahren, fliegen)

- Fortbewegung (in einem Publikum herumreichen)



Wie Signalstärke





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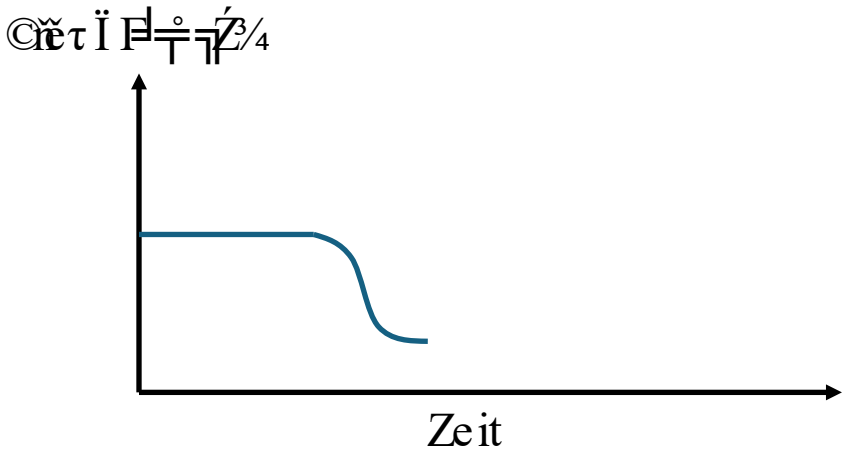
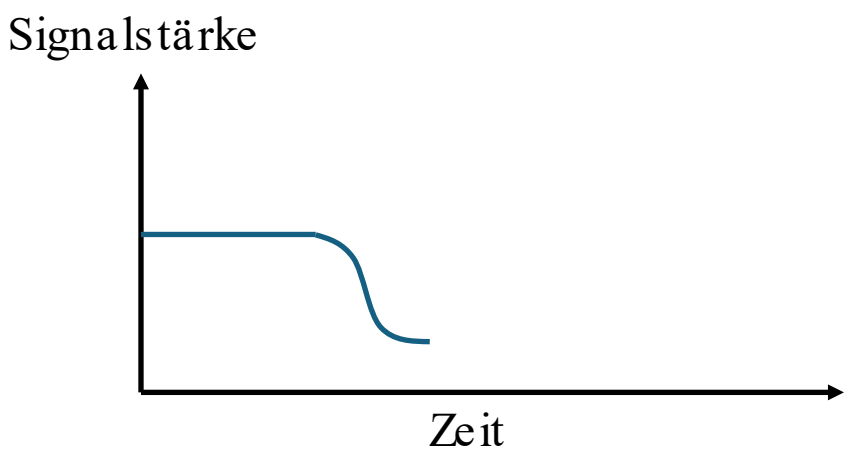
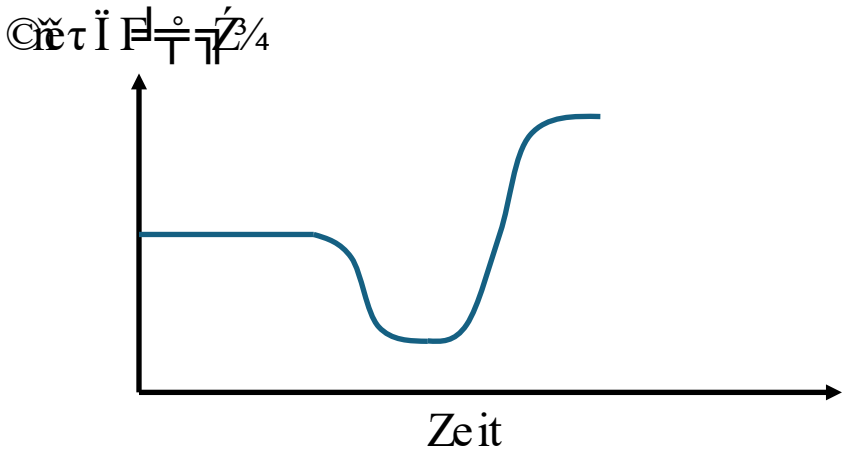


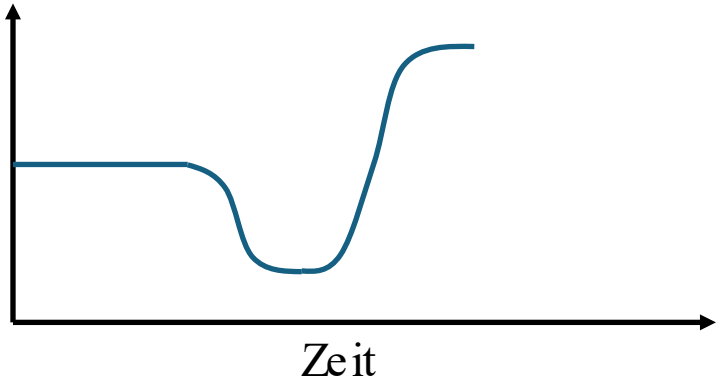


Wie

Signalstärke



Signalstärke



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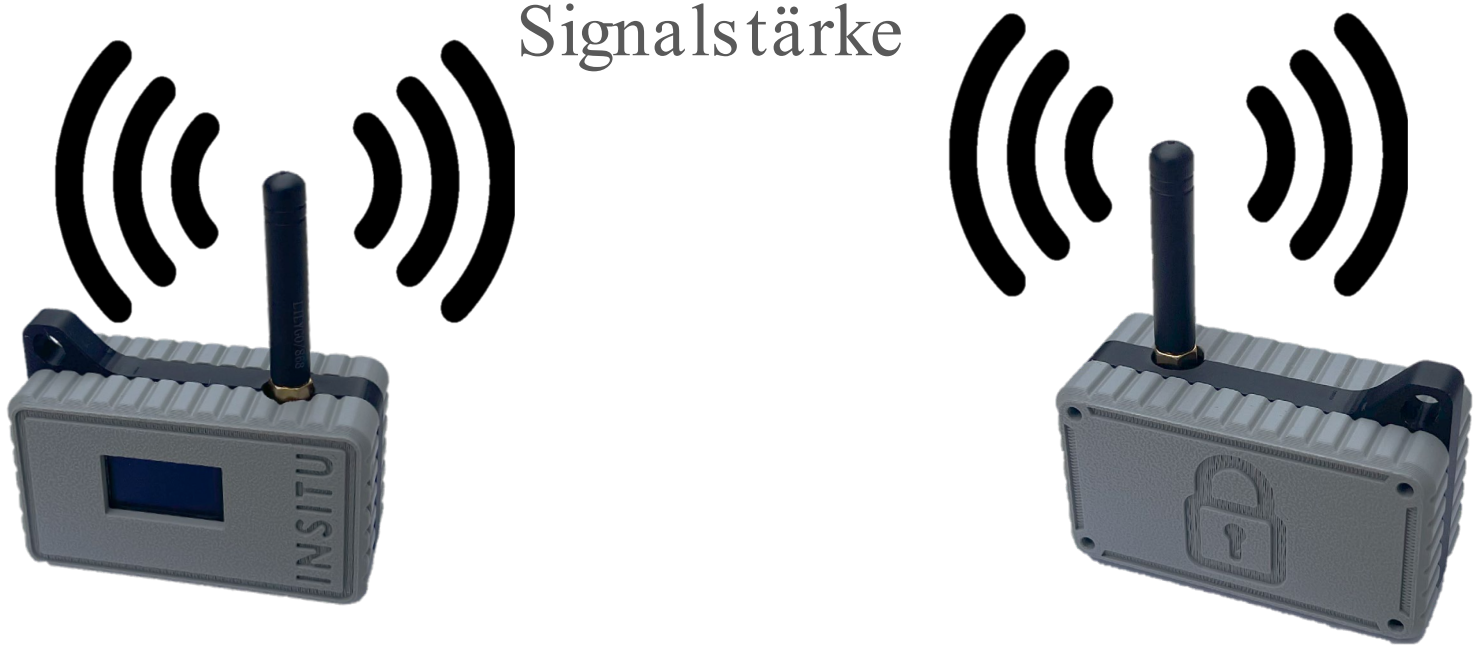
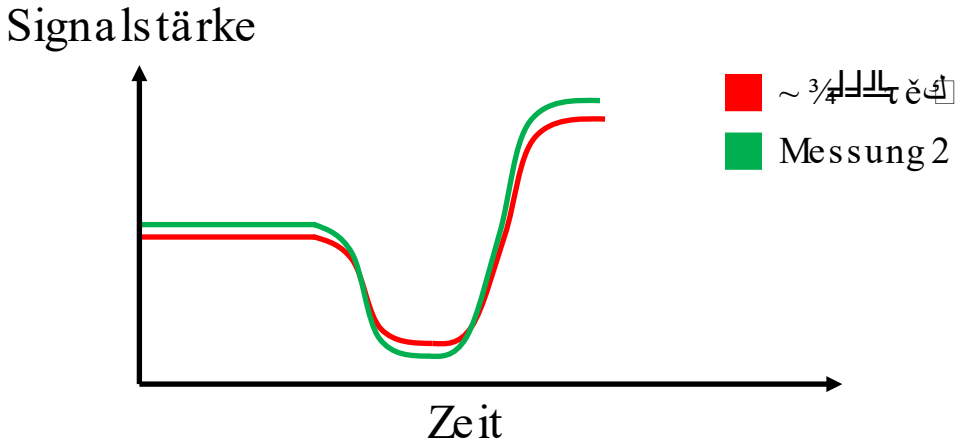
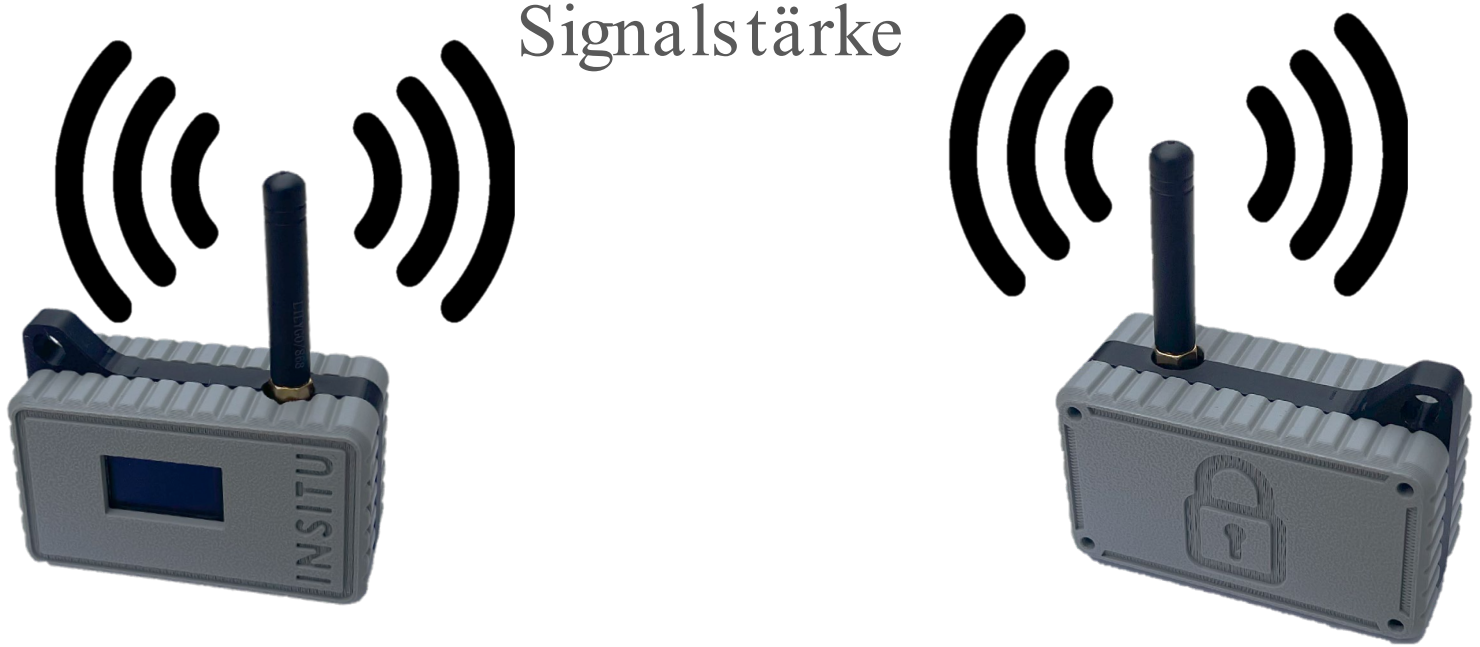
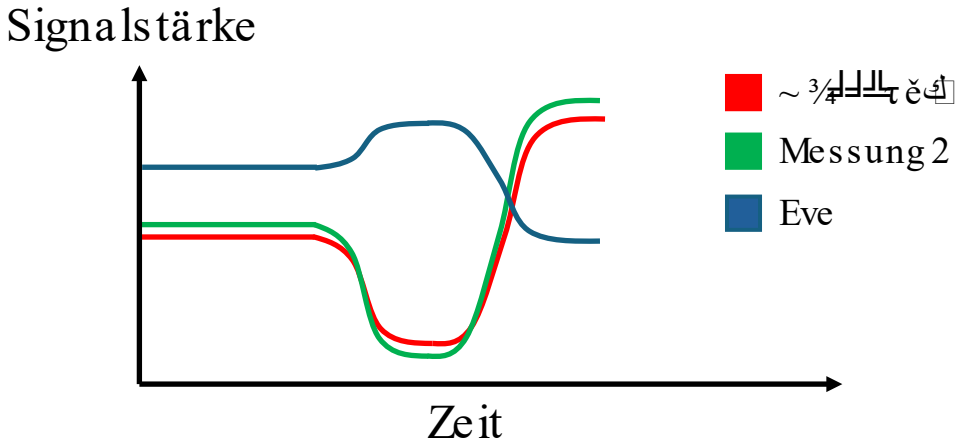




Wie Signalstärke





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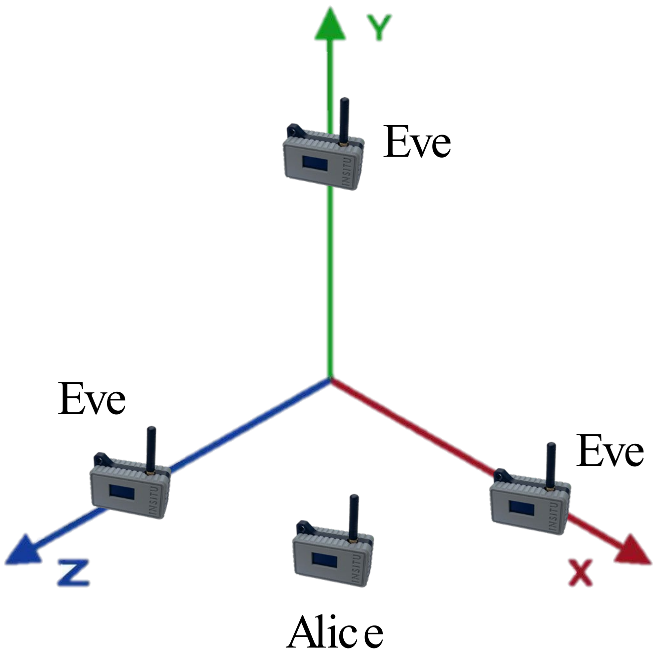
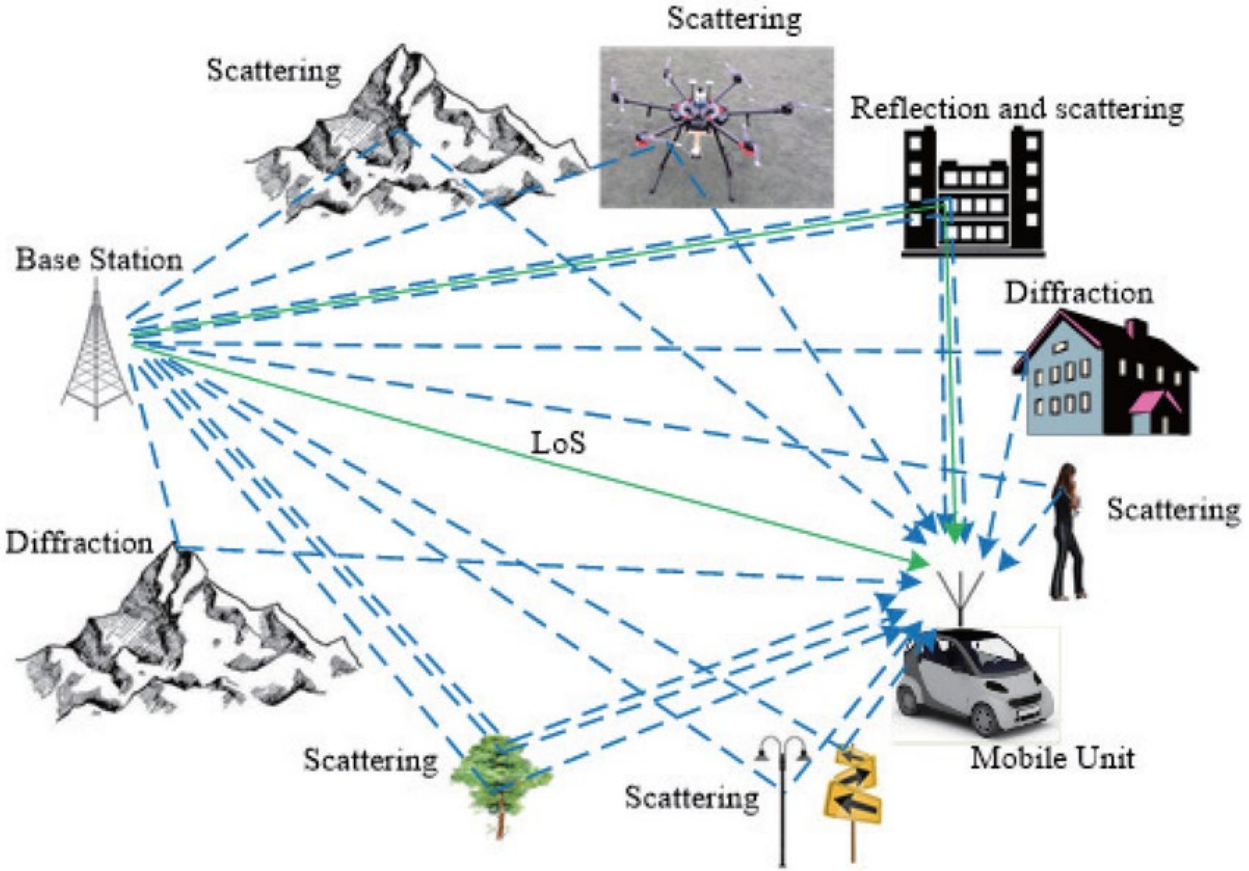
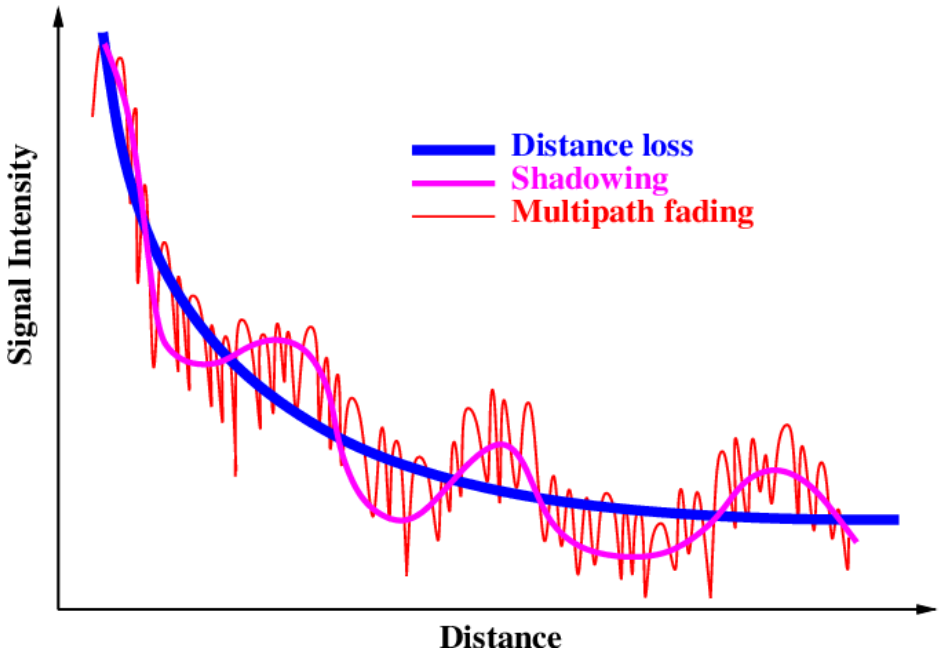


Wie

Good Luck





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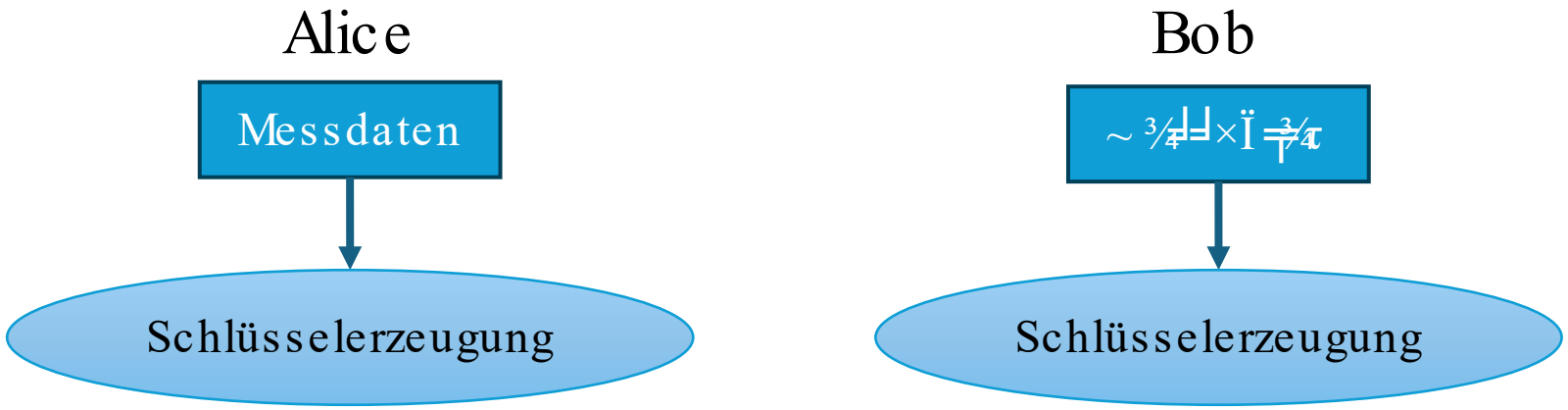
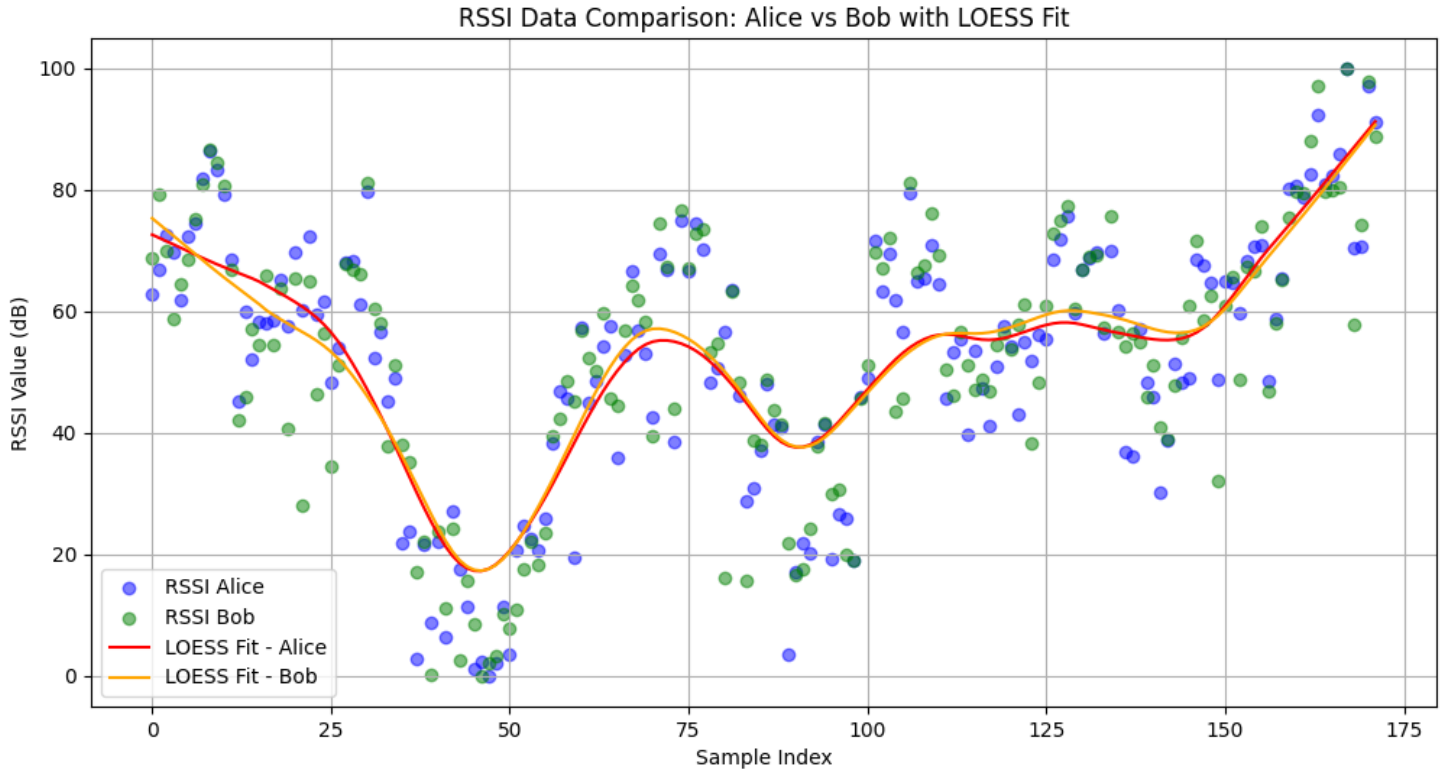

Alice
Messdaten
Schlüsselerzeugung
Bob
Schlüsselerzeugung

Wie

Schlüsselerzeugung



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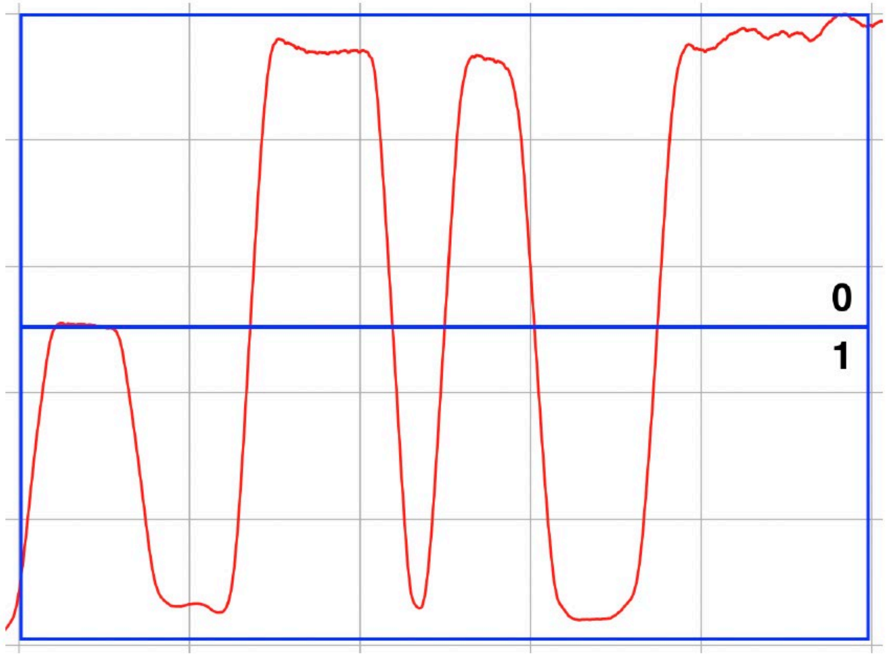
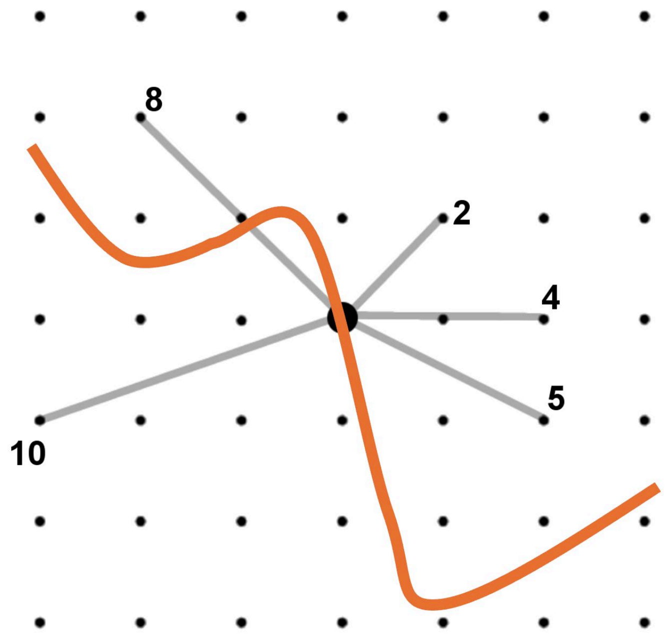
1	0	0	1	0



(a) 1-Bit Auflösung



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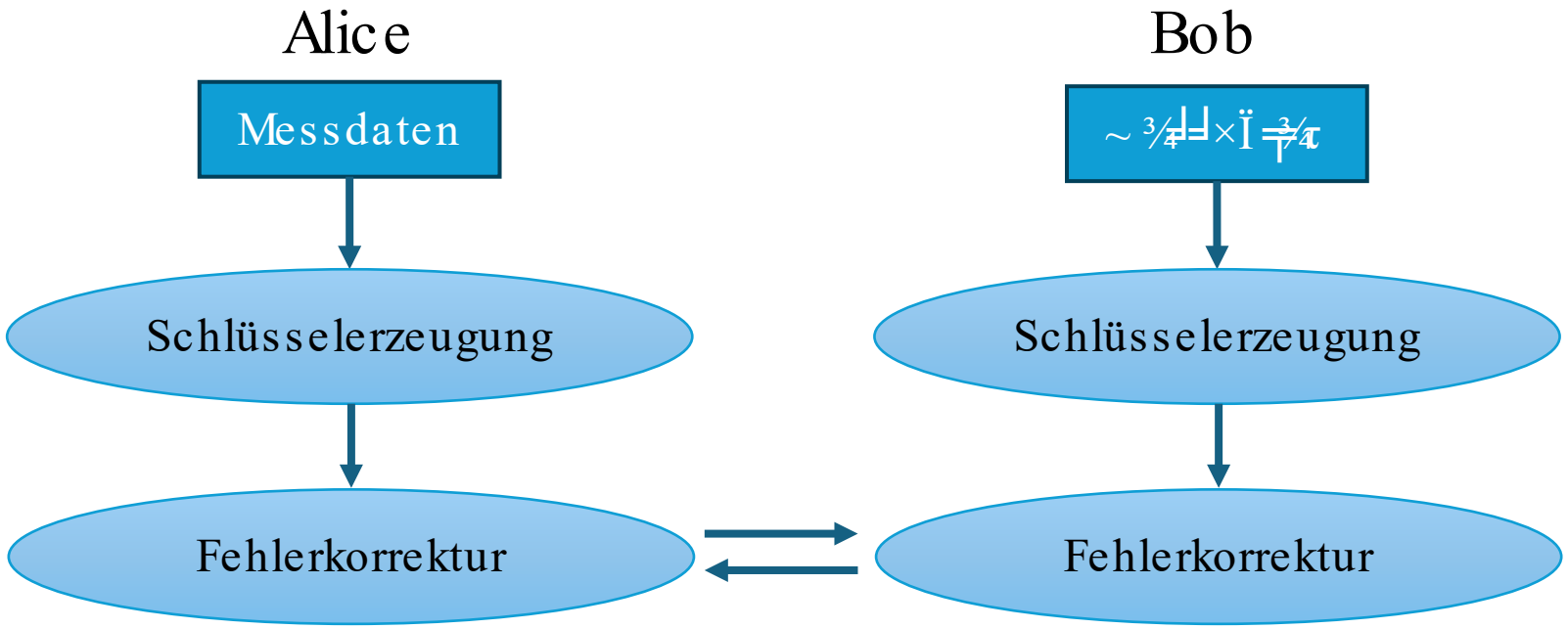
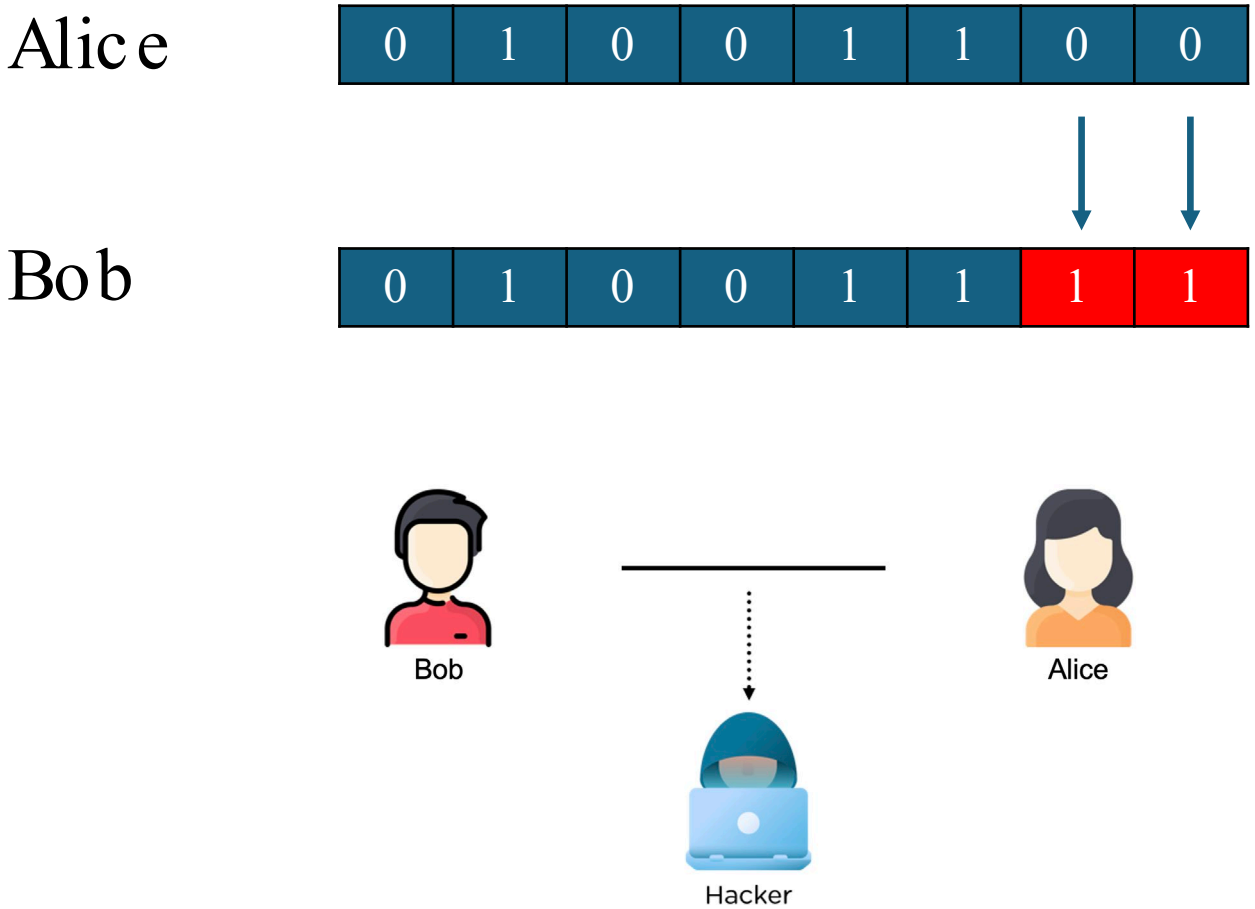

Alice
Bob
Messdaten
~ ¾╩═×Ï═¾τ
Schlüsselerzeugung
Schlüsselerzeugung
Fehlerkorrektur
Fehlerkorrektur

Wie

Fehlerkorrektur

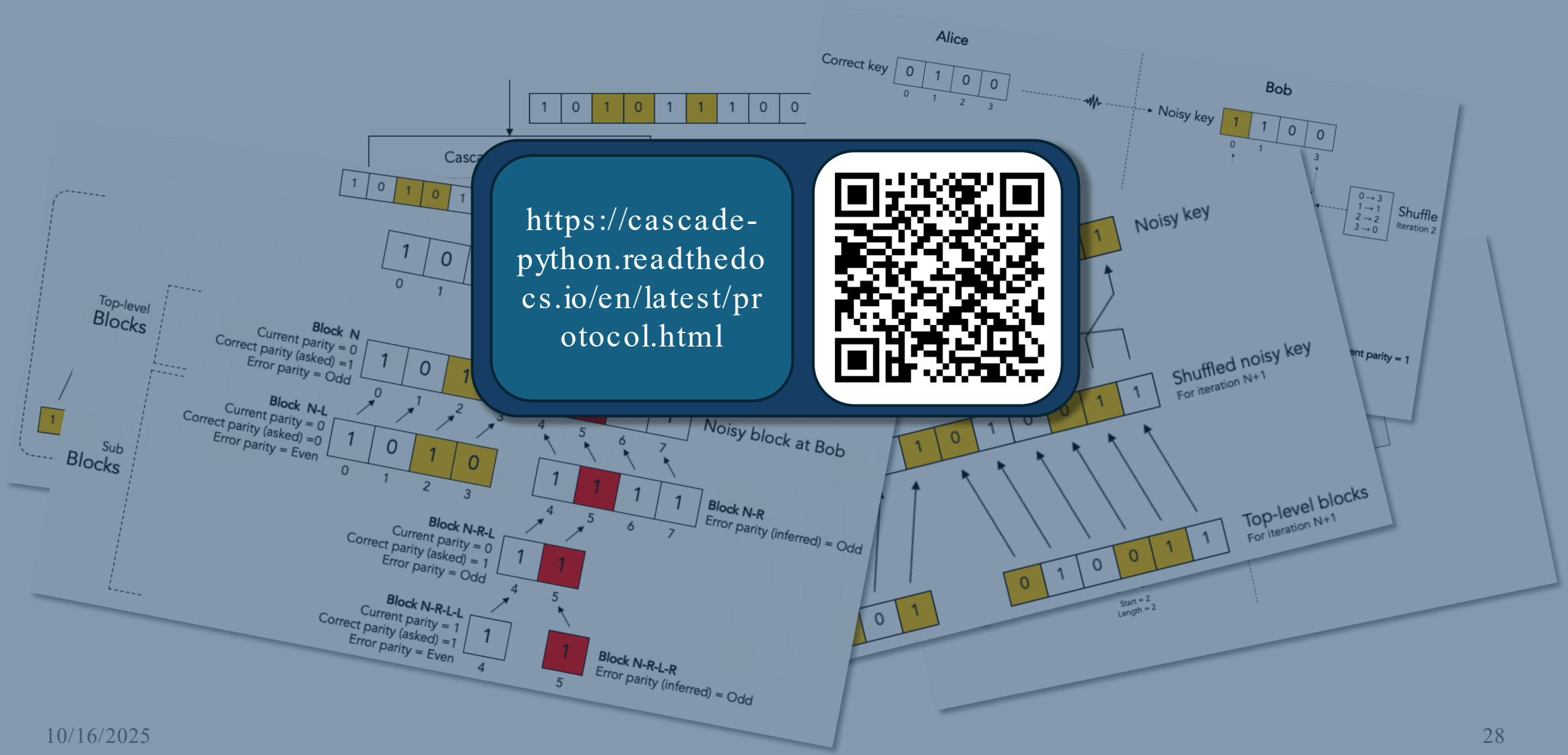


Wie

Cascade Error Correction

Wie

Cascade Error Correction



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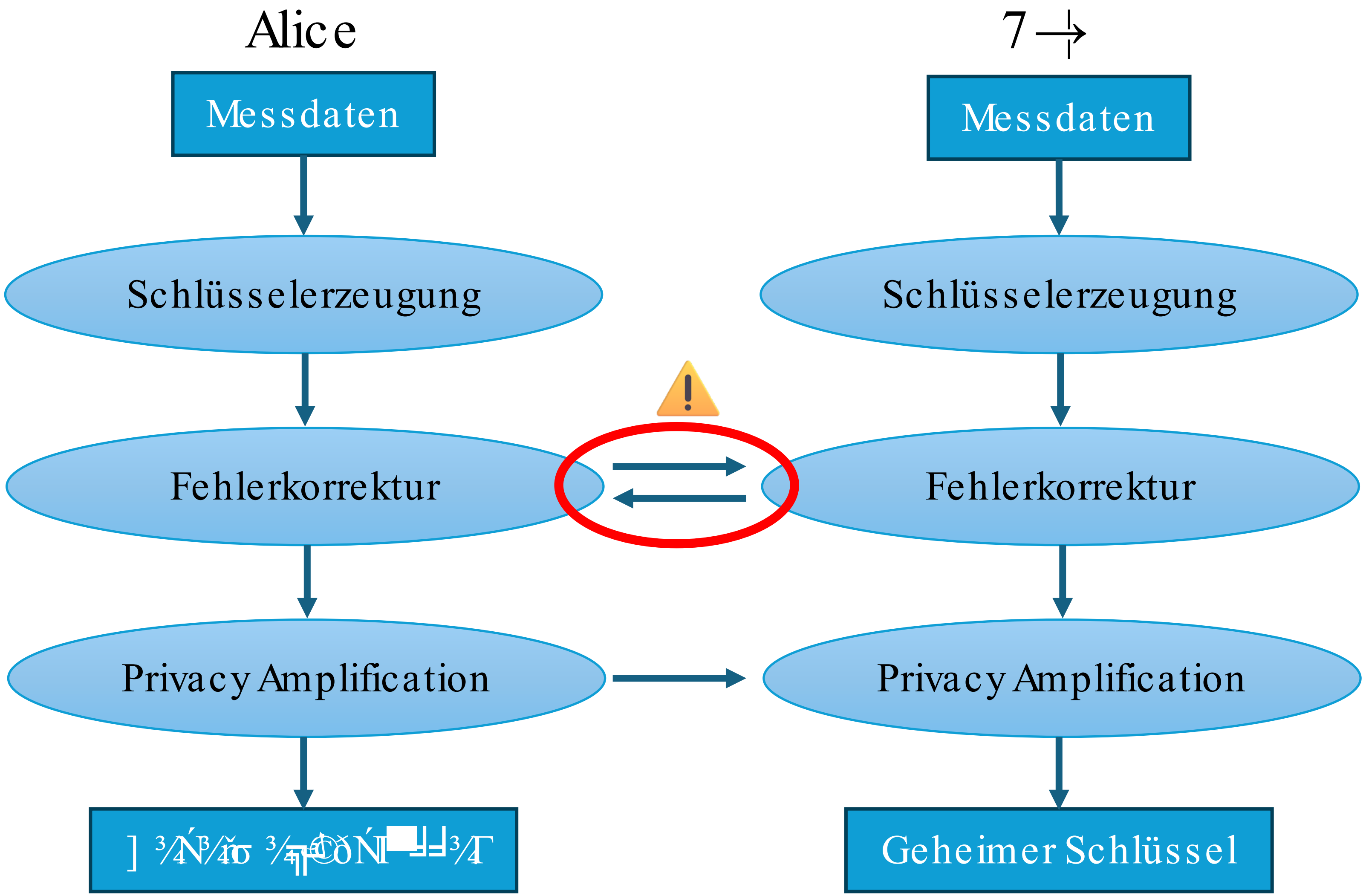
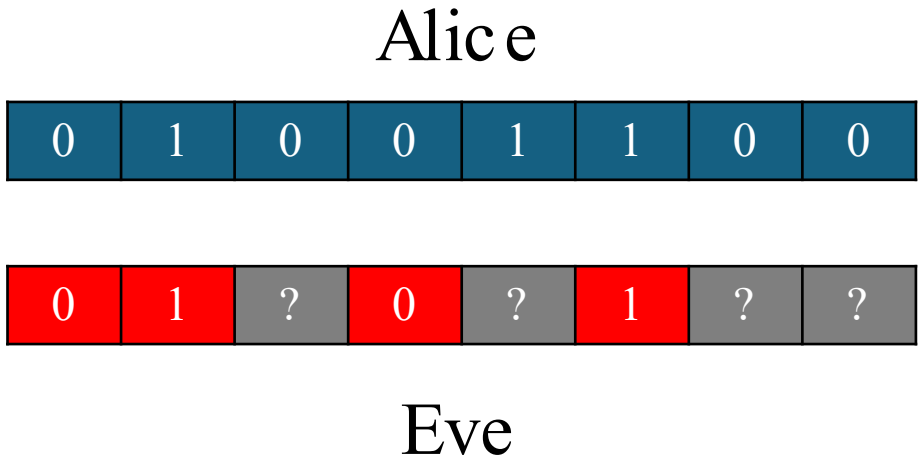

Alice
Messdaten
Messdaten
Schlüsselerzeugung
Schlüsselerzeugung
Fehlerkorrektur
Fehlerkorrektur
Privacy Amplification
Privacy Amplification
Geheimer Schlüssel

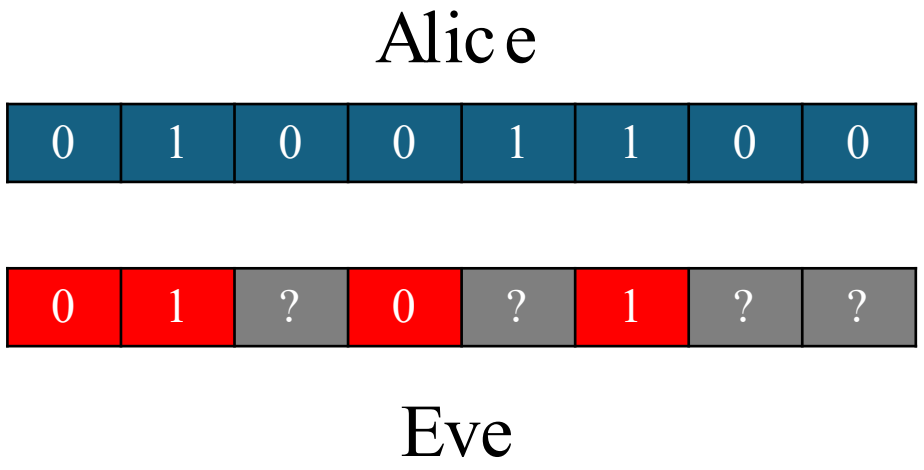
Wie

Privacy Amplification



Wie

Privacy Amplification



Leftover Hash Lemma:

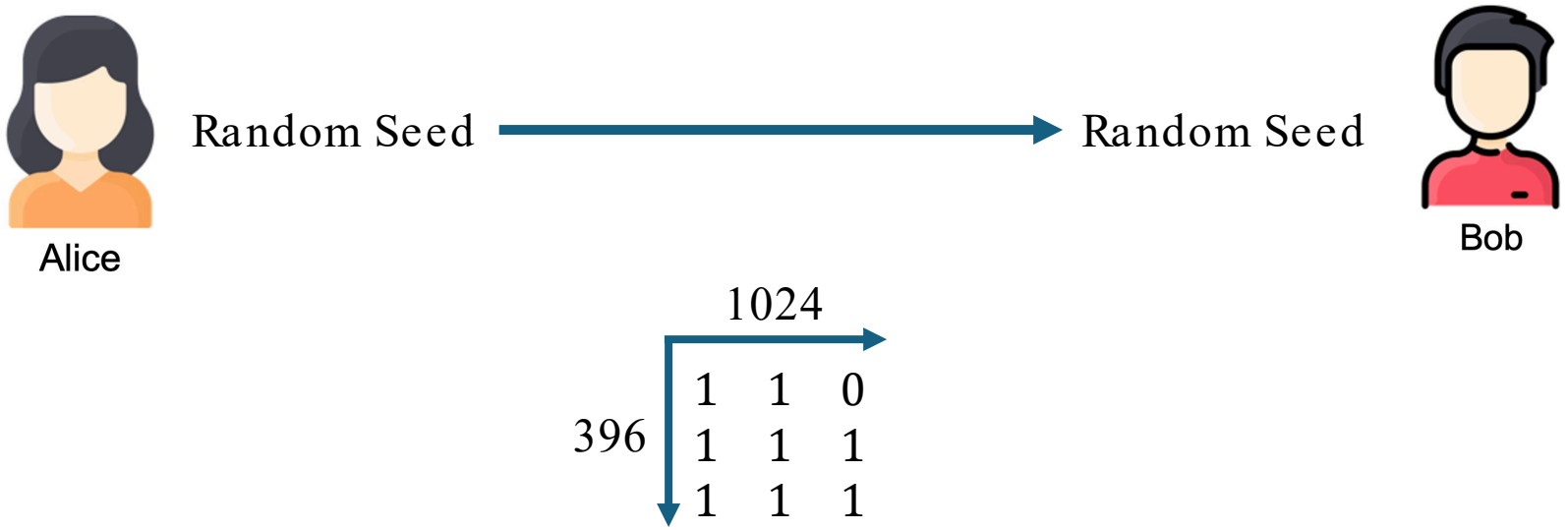
$Roher\ Schlüssel = X$
$Schlüssel\ Bits = n = 1024\ Bits$
$Leaked\ Bits = t = 500\ Bits$
$Sicherheitsmarge = □ = 128\ Bits$

$Sicherer\ Schlüssel = n - t - □ = 396\ Bits$

Wie

Privacy Amplification

$Schlüssel\ Bits = n = 1024\ Bits$
$Sicherer\ Schlüssel = s = 396\ Bits$



Wie

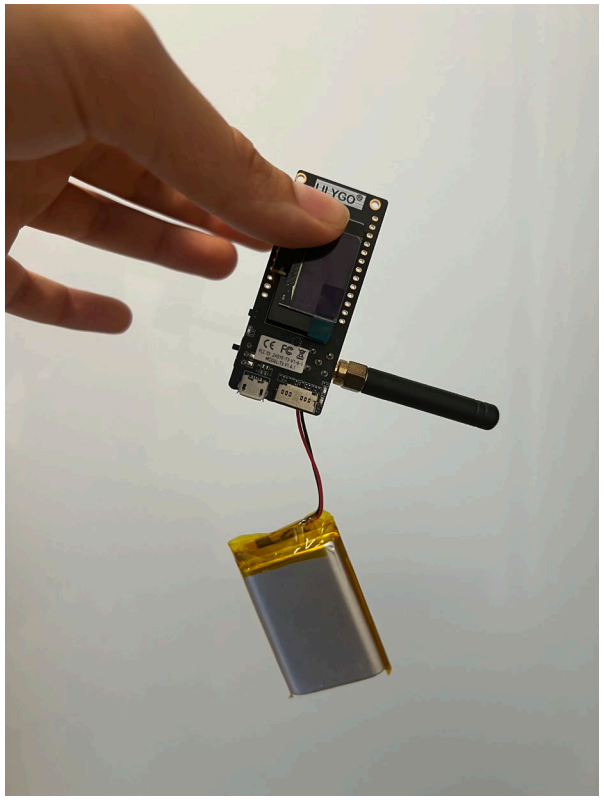
Privacy Amplification

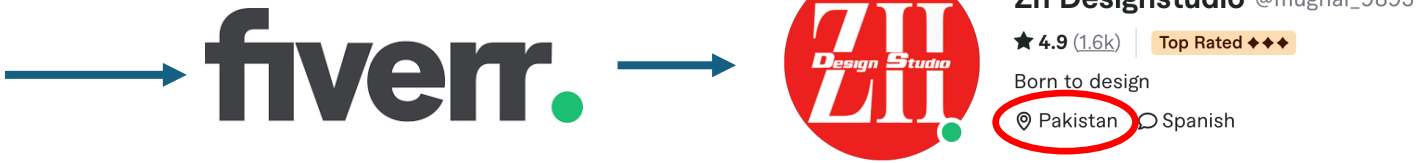
$Schlüssel\ Bits = n = 1024\ Bits$
$Sicherer\ Schlüssel = s = 396\ Bits$

$$1\ \ 0\ \ 1\ \ldots \times \begin{matrix} 1 & 1 & 0 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{matrix} = 0\ \ 1\ \ldots$$

Wie

Gehäuse




fiverr.
Zh Designstudio @mughal_9895
4.9 (1.6k)
Top Rated
Born to design
Pakistan
Spanish

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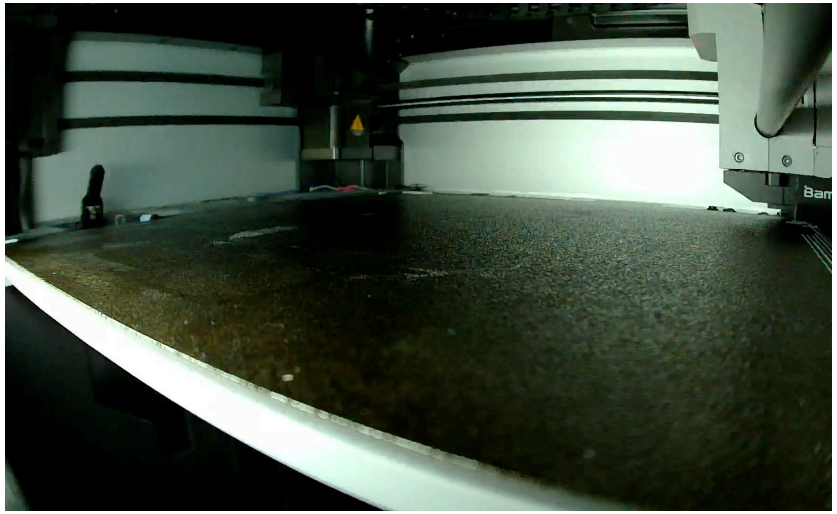
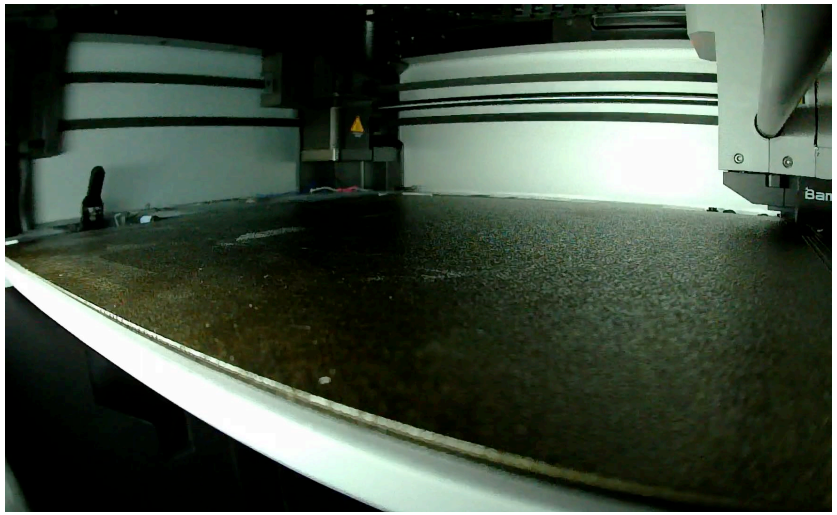
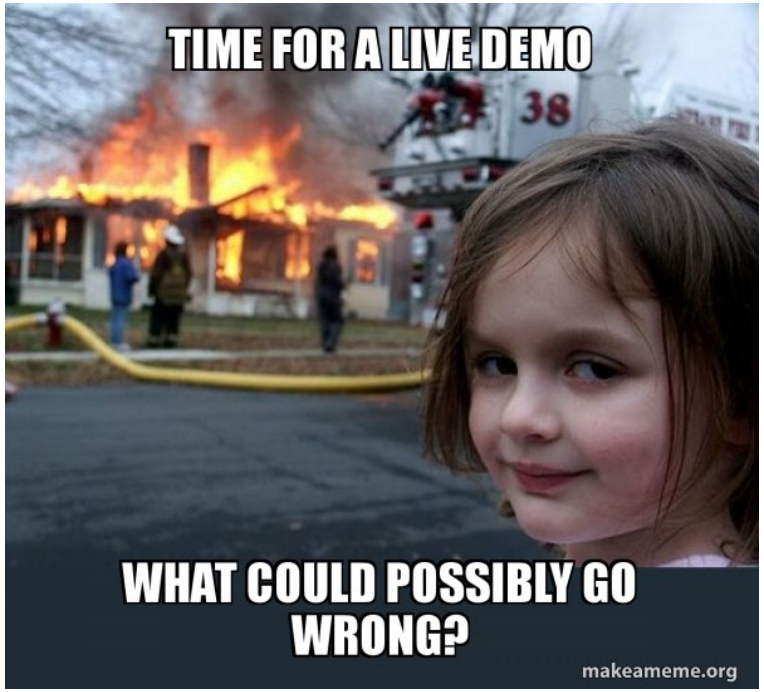
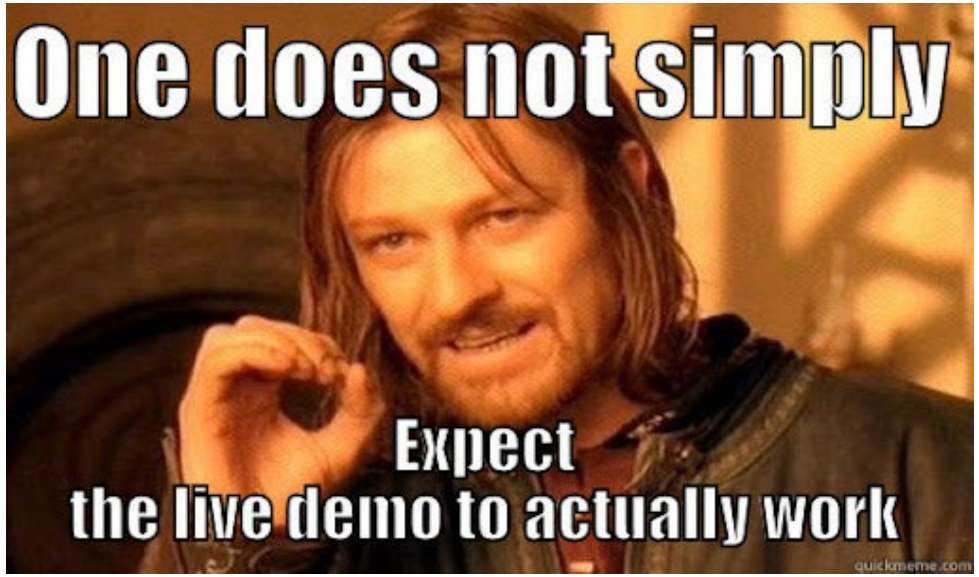
Gehäuse

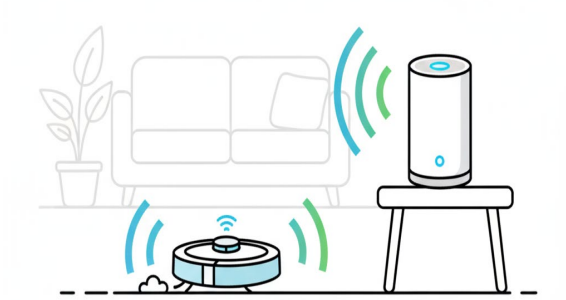


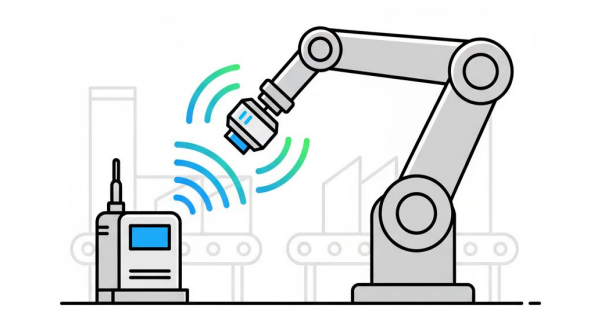


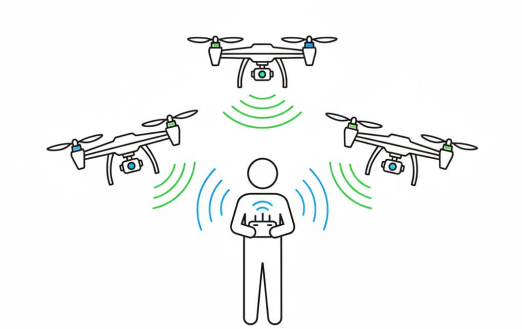
Live Demo


TIME FOR A LIVE DEMO
WHAT COULD POSSIBLY GO WRONG?
makeameme.org


One does not simply
Expect
the live demo to actually work
quickmeme.com







Wofür

Umfeld mit unvermeidbarer Dynamik