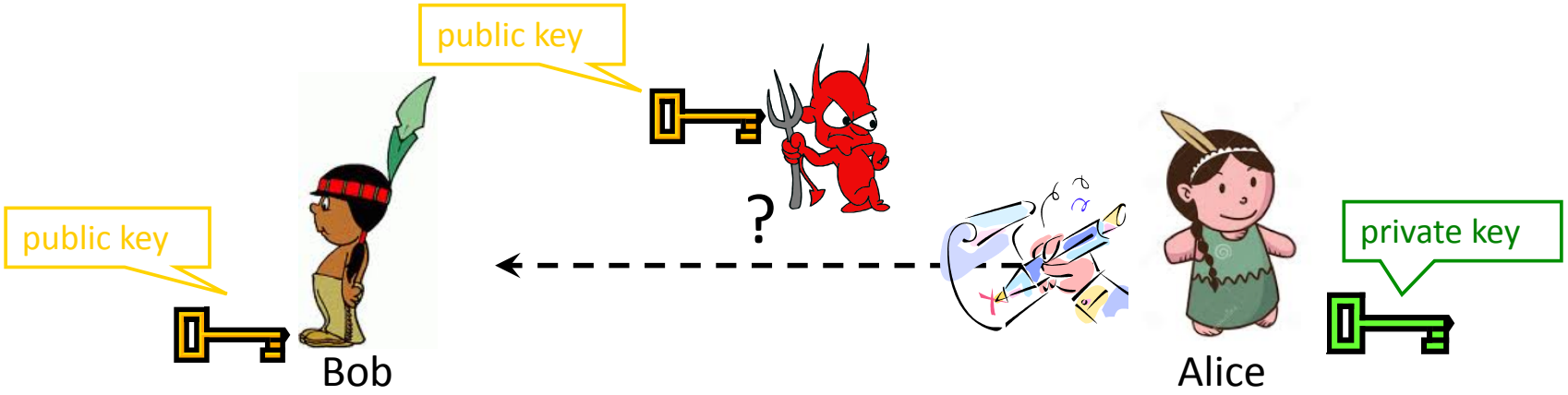
Digital Signatures



Everybody knows Alice's public key
Only Alice knows the corresponding private key

Goal: Alice sends a "digitally signed" message

1. To compute a signature, must know the private key
2. To verify a signature, only the public key is needed

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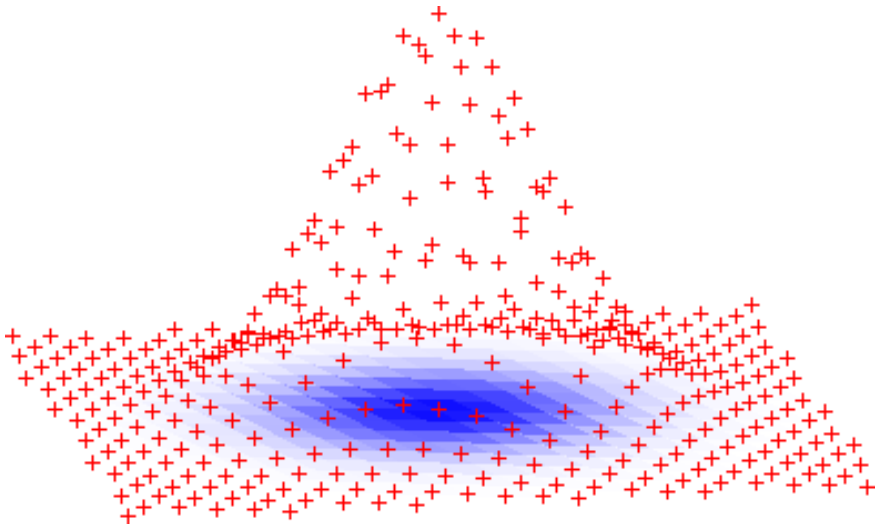
  Draw $\mathbf{z}$ from a distribution that reveals nothing about secret key:



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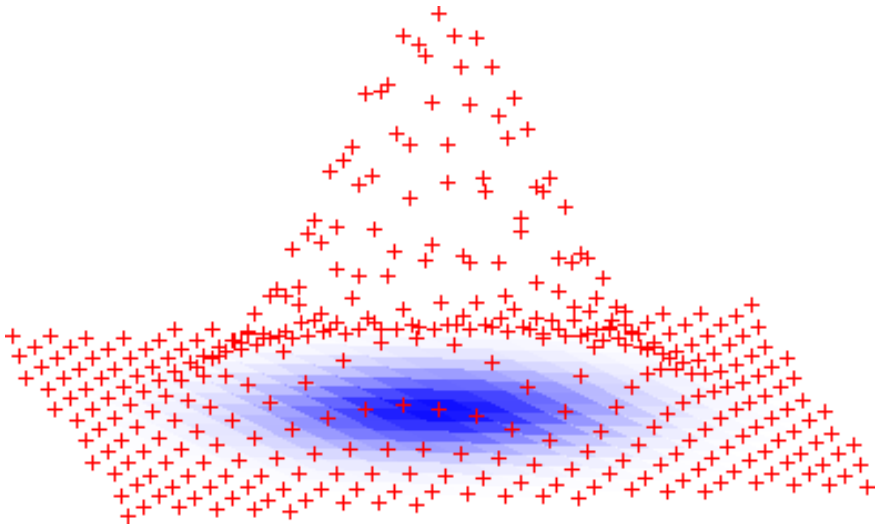

- Verify$(\mathbf{A}, \mu, \mathbf{z})$: check that $\mathbf{A}\mathbf{z} = H(\mu)$ and $\mathbf{z}$ is sufficiently short.
- Security: forging a signature for a new message μ^* requires finding short $\mathbf{z}^*$ s.t. $\mathbf{A}\mathbf{z}^* = H(\mu^*)$. This is SIS: hard!