

## The Basic Model of Public Key Systems

### Communication model:

1. Alice generates a pair of keys: **e** (public key) and **d** (private key).
2. She keeps **d** secret, but makes **e** public.
3. If Bob wants to send a message to Alice, he uses Alice's public key **e**.
4. Based on the equation  $c = E(e, m)$ , only Alice can decrypt  $c$  using her private key, with  $m = D(d, c)$ , where  $m$  is the message.
5. If anyone else wants to send a message to Alice, they can also use her public key **e**.

The system is secure from a decryption perspective because only Alice can decrypt the message, but Alice can never be sure if Bob sent the message, as the public key **e** can be used by anyone.

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