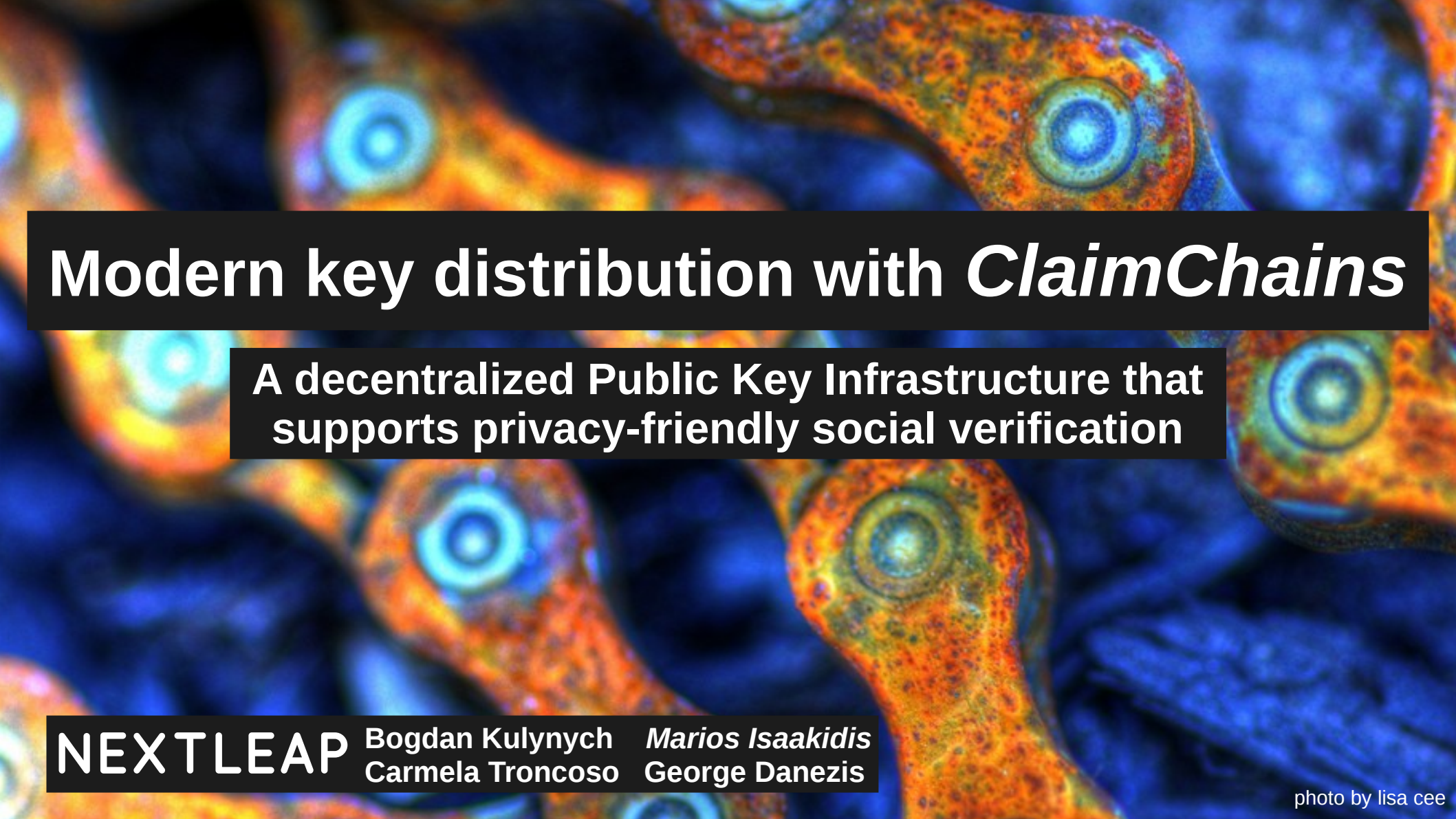

Modern key distribution with *ClaimChains*

A decentralized Public Key Infrastructure that supports privacy-friendly social verification

NEXTLEAP
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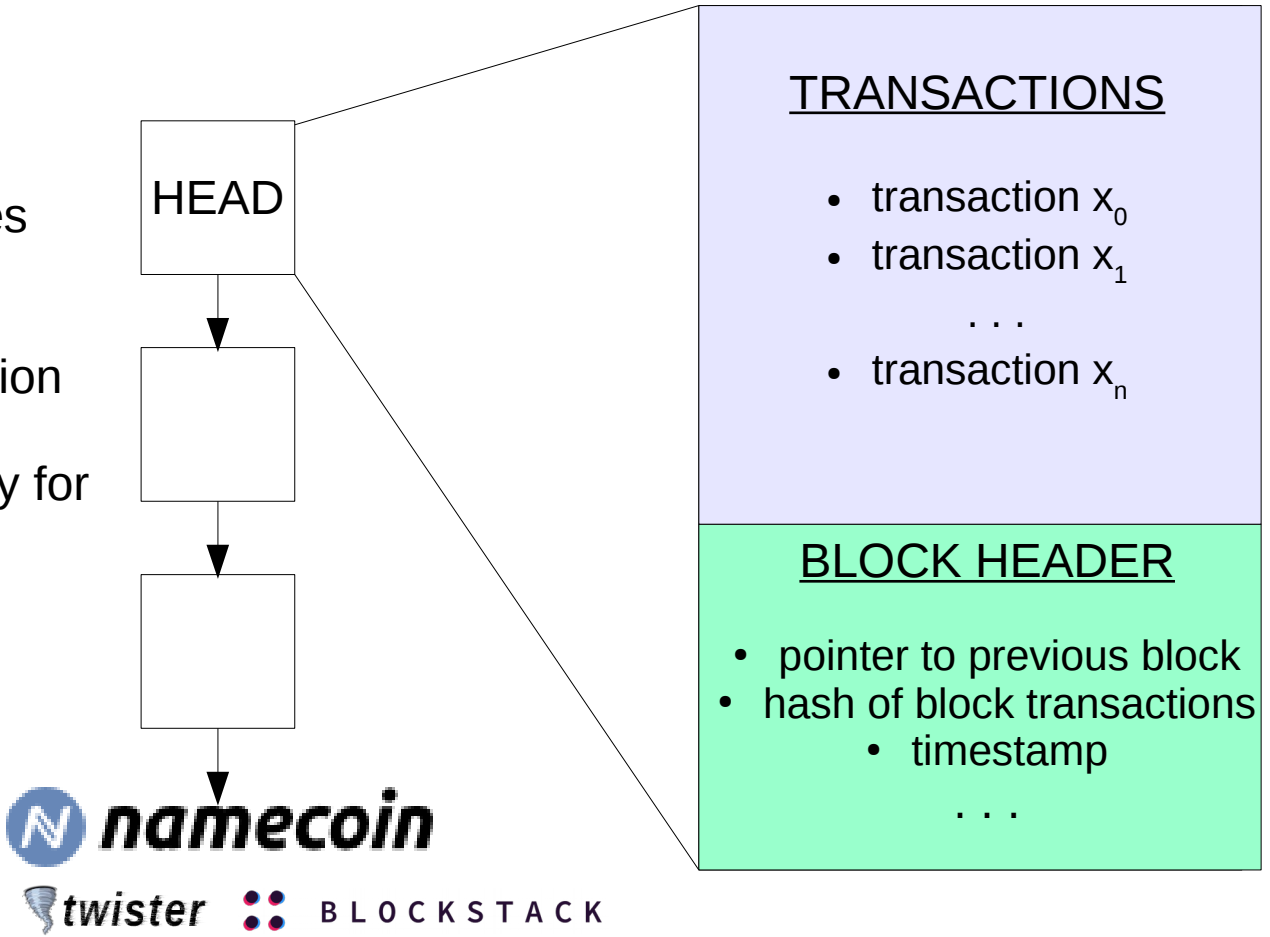
photo by lisa cee


BLOCKCHAINS
HIGH-INTEGRITY
Tamper proof
Authenticity
DECENTRALIZATION
Availability
Censorship-resistant
Global consensus
BLOCKCHAINS EVERYWHERE

Cryptocurrency chains

- ✓ Powerful abstraction for identities
- ✓ Global namespace

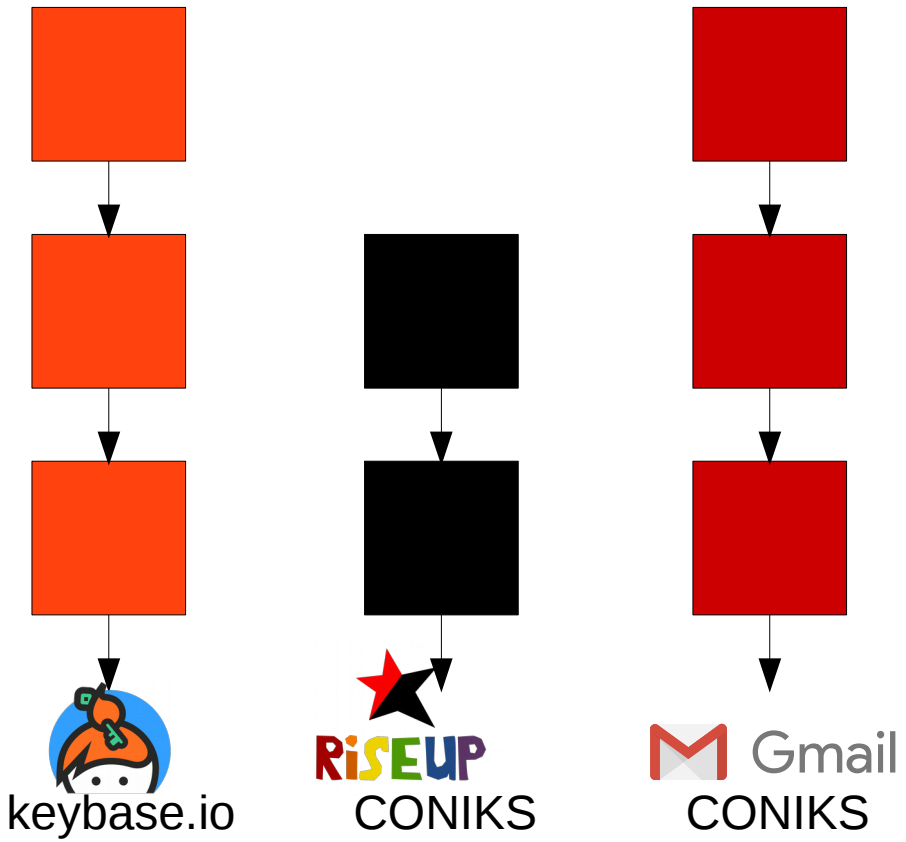
- ✗ No mechanism for social validation
- ✗ All transactions are public
- ✗ Users need to buy coins and pay for transaction fees
- ✗ Resource expensive



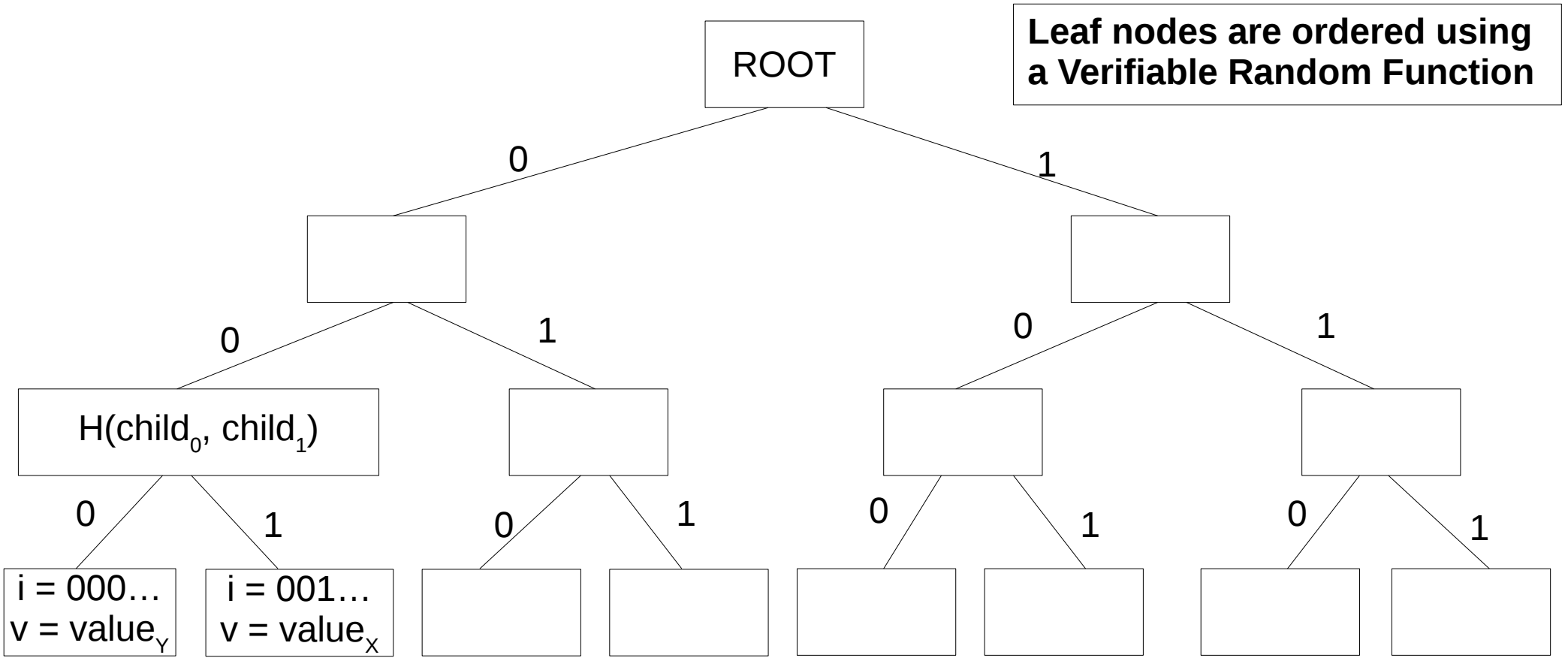
Federated “Merkle prefix tree” chains

- Accountability
- Easy discovery
- Efficient

- Do not prevent equivocation
- Centralization
  - Single point of failure
  - Surveillance



Merkle binary prefix trees

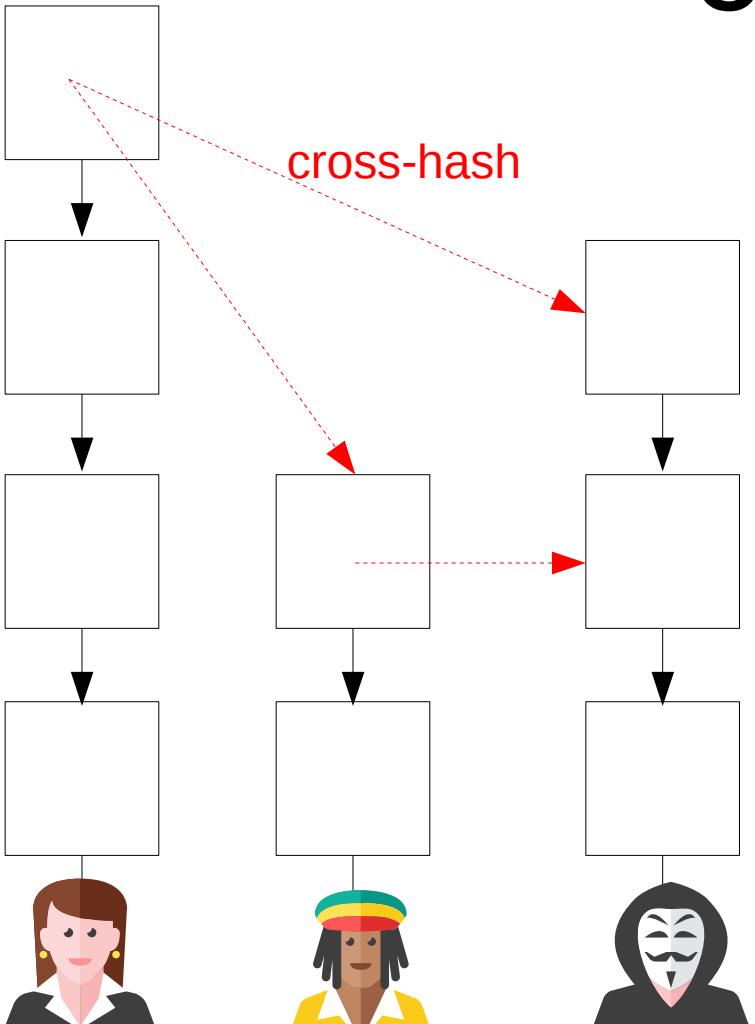


ClaimChains

claimchain.github.io

photo by Wendi Halet

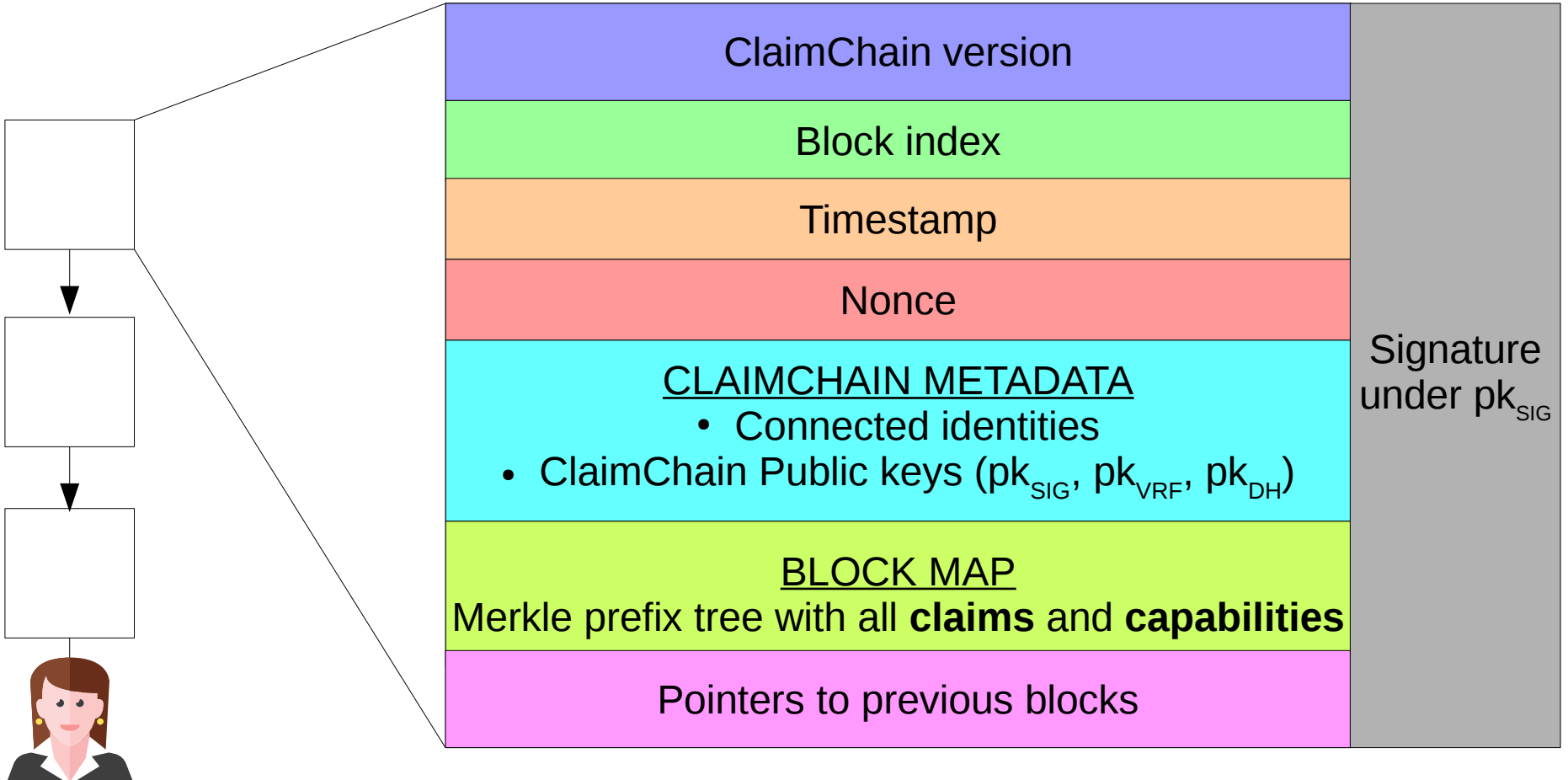
ClaimChains



- A ClaimChain for each user/device/identity
- Blocks appended as needed
- Compromises appear as ClaimChain forks
- Private Claims
- Chain owner selects who can read a specific claim - all readers get the same content

- Propagation of key updates in “cliques” of users
- Vouch for the latest state of a friend’s ClaimChain
- Privacy-friendly social validation - Web of Trust

ClaimChains block structure



Resilience

- Field research to understand user needs
- Collaboration with related communities
- Formal methods from security research:
  - Cryptographic games to define security and privacy properties
  - Formally verified implementation
- Simulations using real world data
- Interoperability and plans for gradual deployment

- User-centric design
- Multidisciplinarity
- Open Innovation (open access and extendability)


Thank you
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claimchain.github.io
photo by alcidecota