Cryptographic Engineering

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Organization of the course

Week 38 (Sept. 18): Crypto Refresh (C. Pernet & P. Karpman)

- Computational algebra
- Field extensions: implementation and applications
- Discrete probabilities

Symmetric Crypto (Pierre Karpman)

- Block ciphers and symmetric encryption
- Hash functions
- MACs and authenticated-encryption
- Design and implementation of Block Cipher

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Lab sessions

Organization of the course

Asymmetric Crypto (C. Pernet & E. Peyre & J-L Roch)

- Computational security: complexity classes and reductions
- RSA and attacks
- DLP over finite fields; index calculus
- Coding theory applied to post-quantum cryptography
- Elliptic curves (E. Peyre)
- 0-knowledge, homomorphic cryptography, and applications (JLR)

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Security Models (Cristian Ene)

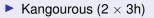
- Properties and proof of correction of crypto primitives
- Protocol verification in the symbolic model

Lab Sessions

Symmetric Crypto (Pierre Karpman)

- ► AES(2 × 3h)
- 2nd pre-image on long messages (2 × 3h)

Asymmetric Crypto: Pierre Karpman



Security Models: (Cristian Ene)

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▶ (2 × 3h)
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References



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