MTAT.07.017
Applied Cryptography

Introduction

University of Tartu

Spring 2021

Who am I?

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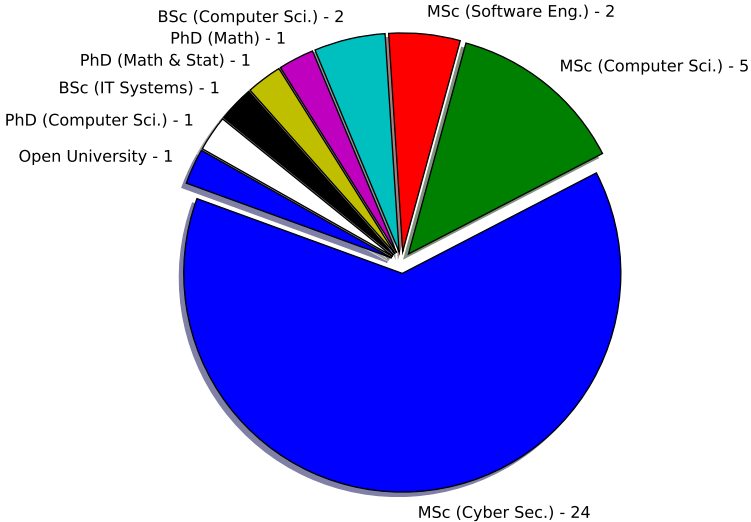
MSc in Cyber Security
Tallinn University of Technology

Computer Science PhD student at University of Tartu

Applied Cyber Security Group: `https://acs.cs.ut.ee/`

Who are you?


BSc (Computer Sci.) - 2
PhD (Math) - 1
PhD (Math & Stat) - 1
BSc (IT Systems) - 1
PhD (Computer Sci.) - 1
Open University - 1
MSc (Software Eng.) - 2
MSc (Computer Sci.) - 5
MSc (Cyber Sec.) - 24

This course

- Learning by implementing, no proofs – just intuition

Course timeline:

- [2021-02-06] 1: Randomness, PRNG, One-Time Pad, Stream Cipher
- [2021-02-13] 2: Abstract Syntax Notation One (ASN.1)
- [2021-02-20] 3: Hash functions and HMAC
- [2021-02-27] 4: Block ciphers (AES)
- [2021-03-06] 5: Public Key Cryptography (RSA)
- [2021-03-13] 6: Elliptic Curve Cryptography (ECC)
- [2021-03-20] 7: Public key certificates (X.509)
- [2021-03-27] 8: Revocation checking (CRL/OCSP)
- [2021-04-03] 9: Digital signatures (XAdES)
- [2021-04-10] 10: Smart cards (EstEID)
- [2021-04-17] 11: Smart cards (JavaCard)
- [2021-04-24] 12: Transport Layer Security (TLS)
- [2021-05-01] 13: Transport Layer Security (TLS)
- [2021-05-08] 14: The Onion Router (Tor)
- [2021-05-15] 15: Bitcoin
- [2021-05-20] Online exam

*6 ECTS – 26*6=156 hours (10 hours weekly)*

Grading

- Homework every week
- Homework assignments give maximum 70% of the final grade
- Deadlines are strict!
  - Homework deadline – Saturday 23:59:59
  - Late submissions get 50% penalty
  - Homework submitted later than 1 week after the deadline is not accepted!
- Exam gives another 30% of the final grade
  - Should be easy if you follow the lectures

Homework submissions

- Homework tasks must be implemented in Python 3
  - Test environment: Ubuntu 20.04, Python 3.8.x
  - Python packages from Ubuntu package repository (not `pip`)
- Create a private Bitbucket repository and grant me 'read' privileges:
  `https://bitbucket.org/appcrypto/2021/src/master/setup/`
- Add your repository to the course grading page at
  `https://cybersec.ee/appcrypto2021/`
- Homework templates will be published at course repository:
  `https://bitbucket.org/appcrypto/2021/`
- Feedback will be given using code comment feature
- Teaching assistance over e-mail not available
- Do not look at the homework solutions of others!

Academic fraud

- It is academic fraud to collaborate with other people on work that is required to be completed and submitted individually.
- The homework tasks in this course are required to be completed and submitted individually!
- You can help your peers to learn by explaining concepts, but don't provide them with answers or your own work!
  - If you don't see the borders – work alone.
- Copying code samples from internet resources (e.g., stackoverflow.com) may be considered plagiarism:
  - the most basic building blocks may be OK
  - combination (composition) of building blocks is NOT OK
  - If you don't see the borders – limit yourself to Python API documentation.