Welcome to Blockchain Engineering

- how to **engineer** blockchain technology
- No written exam
- Project-based: 5 students

You will learn that blockchain is 95% engineering on top of sophisticated APIs and only 5% validation, crypto and creating trust.

Project-based course

- Enroll by email on a project
  (Brightspace instructions)
- Deadline enrollment: 21Feb 11:59am (Noon)
- Brightspace → GITHUB list of projects
- Weekly meetings with advisors
- Work towards an operational prototype

  WARNING: no running code, no passing grade

Blockchain-lab.org

Blockchain-Lab - Chromium

Blockchain-Lab

www.blockchain-lab.org

Apps XPS13 Declare prn: TUD600215 + Add to Delicio MapleTA SVN central Reservation Syst ExCieTC

Blockchain Lab

BLOCKCHAIN THE TEAM PUBLICATIONS ABOUT FACULTY CONTACT

FACULTY TEAM

Dr. Ir. Johan Pouwelse
Associate professor, PI

Dr. Zeki Erkin
Assistant Professor, Cryptography expert

Prof. Dr. Dick Epema
Section head, Distributed systems

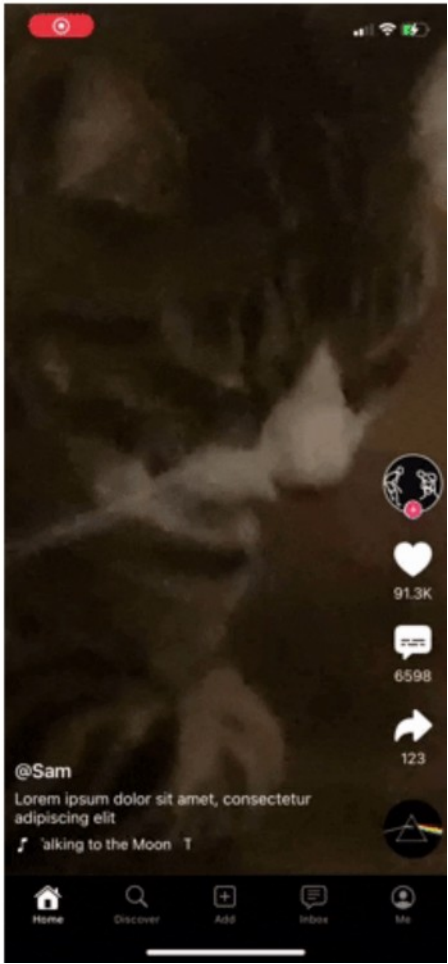
Prof. Dr. Jeroen van den Hoven
Dean of TPM at TU Delft, Ethics expert

Prof. Dr. Dirk Helbing
Professor of Computational Social Science

Prof. Dr. Ir. Rini van Solingen
Professor of Global Software Engineering

Schedule for today 8:45 – 10:30-ish

- This introduction
- 10 teams for Tiktok Token (Decentralised TikTok)
- 9:30 - 10:30 questions + group formation



Blockchain Engineering - class of 2023 #7100

Edit New issue

Open **synctext** opened this issue on Oct 21, 2022 · 0 comments

synctext commented on Oct 21, 2022 • edited Member

<ongoing editing, will be finalised before class kickoff 15Feb 2023>

read below for **class project examples (MANDATORY)** Official place for "class projects" of the Feb 2023 edition of CS4160 by Delft University of Technology.

2023 Tiktok Token from scratch

The class of 2023 will together create a blockchain-based Tiktok alternative from scratch. Teams of 5 students will cover everything: from token-driven video streaming to marking videos ❤️ token. The Kotlin-based superapp will be used as a mandatory programming framework. A skeleton Android TikTok engine will be provided as a starting point. This will help to get you started.

on-campus education - class schedule (slides will be updated) :

On-campus lectures location: Pulse (building 33) Room: A0.400

Week	Description
3.1	course outline slides and presentation of available projects and formation of teams (each 4-5 students)
(15Feb)	8:45 - 9:45 : present all available projects
	9:45 - 10:30 : self-organise and form teams of 4-5 students. Professors available for questions
3.2	Introduction to blockchains, Bitcoin, ledger technology, and DAO (slides) by (Can: TU Delft & IOTA Foundation)

Assignees
synctext
InvictusRMC
OrestisKan

Labels
type: MSc course work

Projects
None yet

Milestone
No milestone

Development
Create a branch for this issue or link a pull request.

Notifications Customize
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Open **Blockchain Engineering - class of 2023** #7100

synctext opened this issue on Oct 21, 2022 · 0 comments

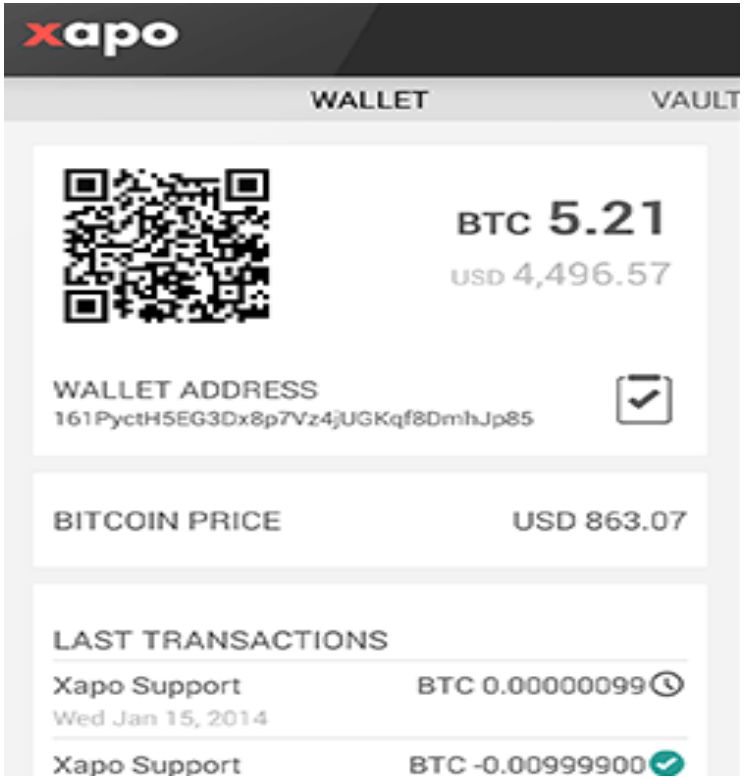
Required token background reading:

- RepuCoin: Your Reputation is Your Power {by Jeremie Decouchant, Professor at Delft Blockchain Lab}
- Utility Tokens and Social Tokens
- MeritRank: Sybil Tolerant Reputation for Merit-based Tokenomics {by responsible professor of this course}

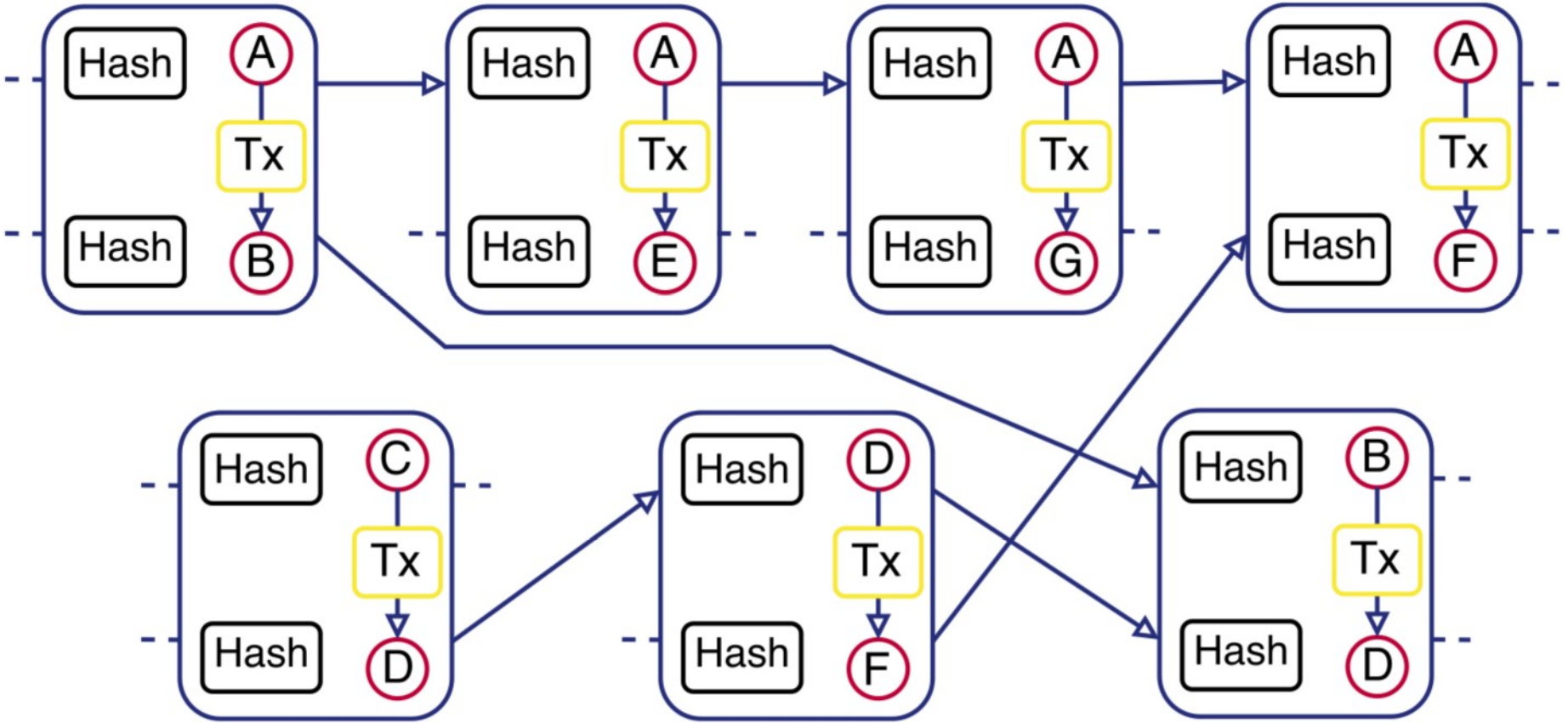
1. **Token Core Design**. You will be responsible for the core token design and realisation. This team is recommended to be senior. For instance, with Honor level grades, significant coding experience, and willingness to learn. Token Wallet, video payment, video playback, and swipe. The bandwidth token is essential to streaming. Other phones will give you video content in exchange for tokens. Video is transfered using Bittorrent between Android phones, meaning no server or seedbox is needed. The token wallet will record the tokens owned by the user and transactions. To avoid spending time on video playback, simply use the axoplayer already integrated within the superapp. Swiping between already downloaded video files should be fast, smooth, (and addictive?). Required background reading: ConTrib: Universal and Decentralized Accounting in Shared-Resource Systems.
2. **Live video streaming**, background downloading, swiping, and token payments. You cardinal task is to make sure the video *never* stops playing. Download any creative commons licensed Bittorrent swarm in the background. When the user swipes, show the next video which is ready for viewing. By downloading content from others you consume the Tiktok tokens. Your balance might even go deeply negative! You are free to re-use the code from the token core design team and the transaction engine team. Required background reading: ConTrib: Universal and Decentralized Accounting in Shared-Resource Systems.
3. **Token transaction engine**. Create a lightweight and fast token transaction engine for mobile devices. Your engine should be able to process 1000 transactions per second with standard 4G connectivity. Record these transactions within a simple SQLite backend. Realise simple primitives such as send/receive token primitives. Required background reading: ConTrib: Universal and Decentralized Accounting in Shared-Resource Systems.
4. **Upvoting token**. Each user can give away an infinite amount of ❤️ tokens. Content creators are rewarded with ❤️ tokens, boosting their visibility. Content gathering lots of ❤️ will get more attention and go viral. Content creators can see in real-time who is giving them a ❤️ token. The ❤️ token economy design and implementation is your responsibility. Part of your demonstration will be a wipe-based UX implementation which favours viral content. Fraud and manipulation of your token economy such as the Sybil attack can be ignored. Bonus background reading: The like economy: Social buttons and the data-intensive web.
5. **Upload for Profit**. By using idle bandwidth on your smartphone you can earn money. Your system will explore how to

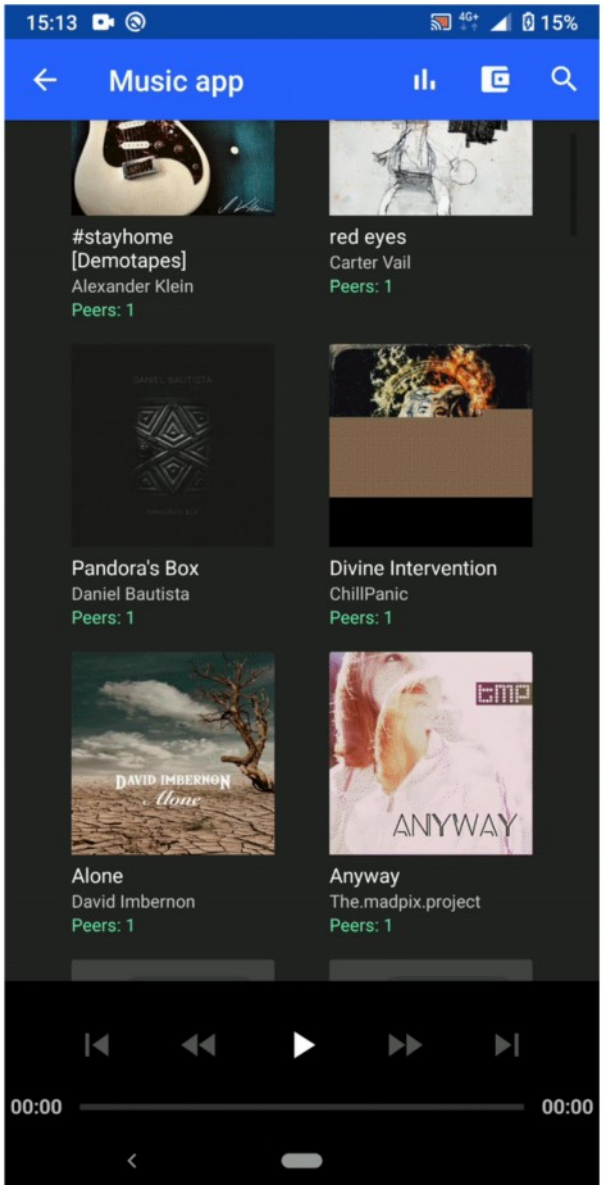
In this course: Bitcoin

- Proposed in 2007 by Satoshi Nakamoto (pseudonym)
- Your public key is your wallet address
- With the private key, you can sign transactions



In this course: Trustchain – by TUDelft

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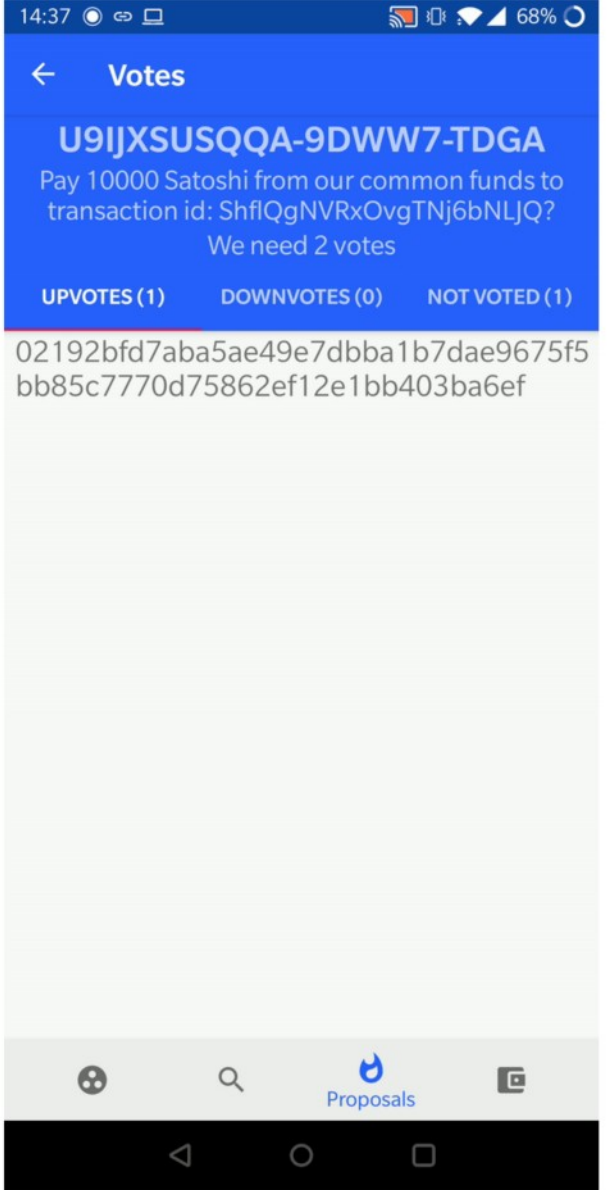
Goals after 10 weeks:

- You had fun
- You have running code
- You ready for msc thesis?

Lab goal: Fix The Internet



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4.Offline token money. Your task is to create easy payments using tokens, without Internet. Giving and receiving tokens should be easy and effortless. Special requirement is that it should also work in an emergency: when the Internet is down. Probably you need to use QR-codes scanning to move Tiktok Tokens between devices. The hard scientific task is to address the double spending risk. Required background reading from Delft:Â Double spending prevention of digital Euros using a web-of-trust.

5.Upvoting token. Each user can give away an infinite amount ofÂ Â tokens. Content creators are rewarded withÂ Â tokens, boosting their visibility. Content gathering lots ofÂ Â will get more attention and go viral. Content creators can see in real-time who is giving them aÂ Â token. TheÂ Â token economy design and implementation is your responsibility. Part of your demonstration will be a wipe-based UX implementation which favours viral content. Fraud and manipulation ofÂ your token economy such as the Sybil attackÂ can be ignored. Bonus background reading:Â The like economy: Social buttons and the data-intensive web.

6.Upload for Profit. By using idle bandwidth on your smartphone you can earn money. Your system will explore how to earn as much tokens as possible, known as token mining. You make a profitable investment when you download content once and upload it numerous times. Due to storage limitations the key decision to make is: which Tiktok-like content to invest in. By doing yield prediction you maximize your income. Required background reading:Â Decentralized credit mining in P2P systems.

7.Token overlay 4G/5G/Wifi You will make the first reliable token communication network for smartpones. Smartphones are by design critically dependant on the Google or Apple cloud. Pure peer-to-peer operations between smartphone is not really support. You will solve this problem. This task is to create a reliable communication network from unreliable smartphones with restrictive networking by telecom operators.Â Carrier-grade NAT devicesÂ restrict the Internet capability of any smartphone: you can't receive incoming connections. Required background reading:Â A Multi-perspective Analysis of Carrier-Grade NAT Deployment. We can hack the restrictions put in place by Big Tech and Big Telco companies. With the help of theÂ birthday paradox. You will open, say, 256 sockets on each side andÂ try to create a direct connection, read the exact details of this idea here. This task ensures first class support for Android-2-Android token transfers, credit mining, and upvoting. Zero trust overlay network is part of the wider scientific challenge of creatingÂ zero-trust architectures.Â recommended for embedded systems experts, not afraid of bits, messages, and UDP sockets.

8.**Novel consensus** Consensus algorithms based on proof-of-work and variants have exploded in popularity since Bitcoin launched in 2009. Older work based on the 1992 idea of aÂ web of trustÂ has not yet been used in the crypto context. Your task is to create the first proof-of-goodness for token validation function,Â based on MeritRankÂ idea. You proof-of-goodness function is capable of detecting fraud. Specifically, when given numerous Tiktok token transactions, a token graph is constructed, and fraudulent areas are identified. You challenge is to create anÂ epic Sybil attackÂ with 70% fraudsters in the network and detect them.

9. Coin minting New tokens and fresh tiktok-like videos are the starting point. Rewarding creators for their work and giving them exposure is what makes the ecosystem thrive. This task covers creator token rewards, video recording, and video uploading. The wallet of artists gets filled with new tokens for each newÂ Â upvote and playback. If your videos go viral, you gather lots of tokens. Using a simple Android camera API its possible to capture videos. These unedited videos can be shared using Bittorrent. The Bittorrent skeleton app will get you started there.

10. Decentralised token exchange Your task is to create a marketplace for tokens. This enables the exchange of Tiktok tokens for Bitcoin or Euros. Markets are a key part of our economy. Decentralisation of markets in general with a permissionless approach is highly disruptive. This is also a difficult task, required reading:
XChange: A Blockchain-based Mechanism for Generic Asset Trading In Resource-constrained Environments
Â Operational Python exampleÂ TradePayloadMessageÂ for your Kotlin efforts.

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HOMEWORK: compile the skeleton