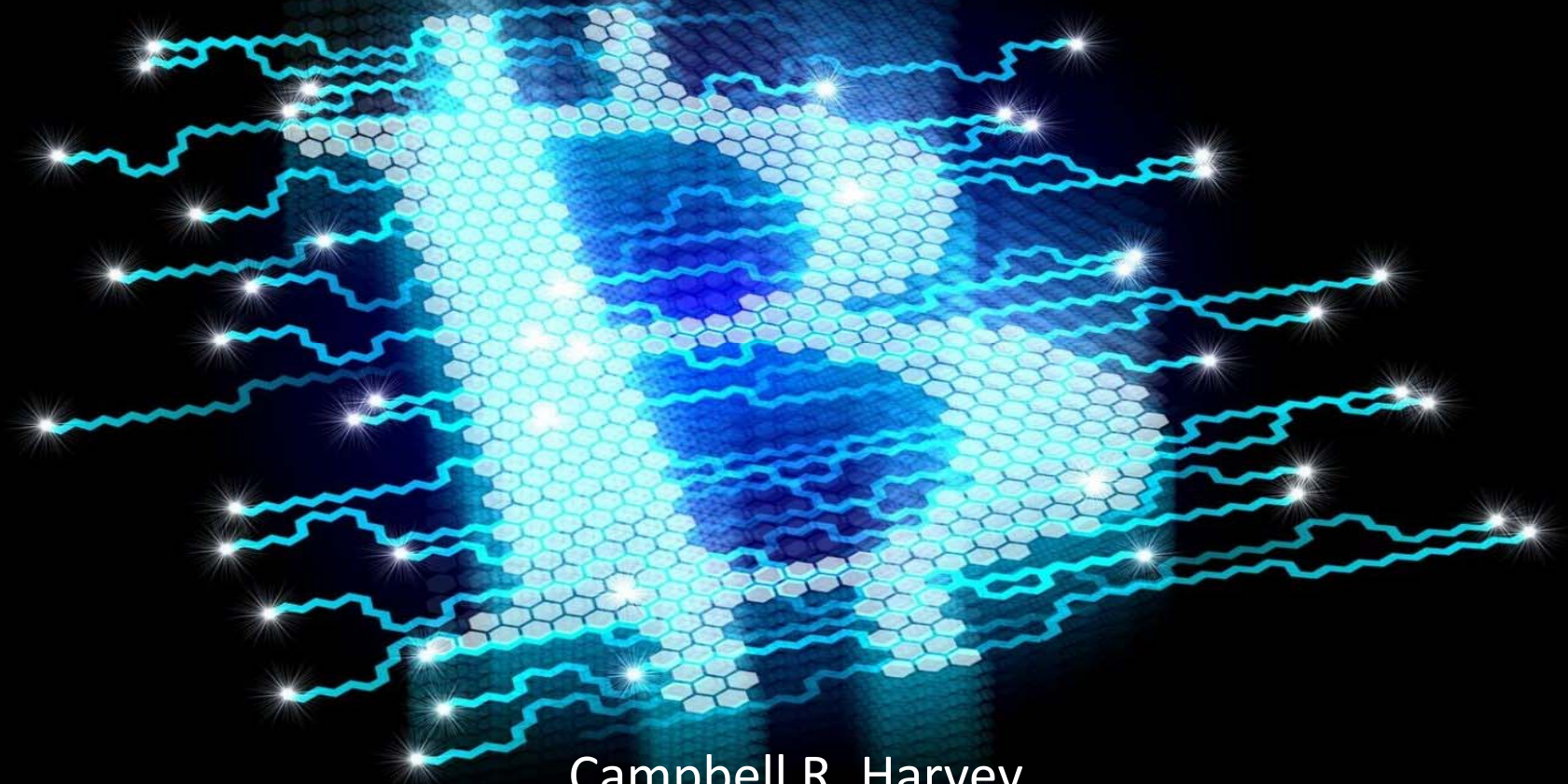


9 Startup Ideas from Duke University's Cryptoventures Course



Campbell R. Harvey
Duke University and NBER

New Course for Spring 2015

INNOVATION & CRYPTOVENTURES

I&E 550

Bitcoin. Risks of new technology. **Disruption forecasting.** **Implications of blockchain.** Venture capital. **Bitcoin 2.0.** Legal and regulatory environment. **Cryptoventures.**

Syllabus

1. The History of Money. High level intro to cryptocurrency.
2. Cryptography 101 (Diffie-Hellman, RSA, Elliptic Curve) and intro to hashing (SHA-2). Private keys and public keys.
3. Blockchain. Byzantine Generals. Privacy and Anonymity. Mining.
4. Blockchain simulation. Permissioned vs. public ledgers.
5. Blockchain applications (Nasdaq, IBM, etc.). Sidechains. Merge mining.
6. Valuing cryptocurrencies.
7. Colored coins and conditional contracts.
8. Applications 21/Lightning/Proofofexistence/Databases/Factom.
9. Applications R3CEV, DAH-Hyperledger
10. Legal. KYC, ALM, BitLicense.
11. Course wrap-up followed by student presentations.

Guest Speakers

- Adam White, January 29, Coinbase
- Stan Larimer, February 5, BitShares
- Austin Hill, February 12, Blockstream
- Jameson Lopp, February 19, Bitgo
- Brad Wheeler, February 19, Bitcoin Foundation
- Barry Silbert, March 19
- Fred Ehrsam, March 26, Coinbase

Main Deliverable

Grade largely determined by the quality of a maximum 15 slide pitch for a new business that has a link to blockchain technology.

Student presentations on last two days of the course.

Teams

Nine groups.

- Diversified membership including:
 - 2nd year MBA,
 - Law student,
 - Engineer, and
 - Computer Science major.
- Course runs January – April.

Great Wall Street Journal Bitcoin Debate

WSJ decides to conduct a debate.

- I am chosen as “Pro” bitcoin.
- My essay is due February 14.
- I ask students to provide comments on my essay. Reverse of the usual teaching situation.

THE WALL STREET JOURNAL.

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<http://www.wsj.com/articles/do-cryptocurrencies-such-as-bitcoin-have-a-future-1425269375>

JOURNAL REPORTS

Do Cryptocurrencies Such as Bitcoin Have a Future?

Innovative alternative currencies come with great possibilities—but also great risks



March 1, 2015 11:09 p.m. ET

YES: Don't Judge Bitcoin by Its Early, Inevitable Problems

By Campbell R. Harvey

Successful innovations solve important problems. Here are some of the problems that bitcoins solve.

- Bitcoins allow online transactions without worrying that personal data (such as credit-card or bank-account details) will be compromised.
- Anyone with a cellphone or Internet connection can execute seamless transactions, even in amounts less than a penny. This is important for many who lack bank access, especially in the developing world.
- International remittances carry trivial fees compared with the 10% charged by current firms in this space.

Great Wall Street Journal Bitcoin Debate

#1 Story on



Financial Times

February 16, 2015

Campbell R. Harvey 2015

ft.com > management >

Business Education

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Business Education Entrepreneurship Business Books Recruitment The Connected Business

FEATURE OF THE WEEK February 15, 2015 10:31 pm

Professors stake out territory for bitcoin

Stephen Foley

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'B' keeper

The last thing Campbell Harvey wants is to find himself playing the role of Lawrence Summers in *The Social Network*, who had to adjudicate arguments between Mark Zuckerberg and the Winklevoss twins when he was president at Harvard University.

NPR


January 26, 2015

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Bitcoin gets its first major U.S. exchange

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(Yoshikazu Tsuno/AFP/Getty Images)

A bitcoin medal is displayed at a bitcoin trading club meeting in Tokyo.

by Mitchell Hartman

Monday, January 26, 2015 - 15:04

Campbell R. Harvey 2015

STORY

Bloomberg

March 2, 2015

Ventureland

Uber revealed last week that its database was hacked about 10 months ago and private information about 50,000 drivers could have been compromised, [Bloomberg](#) reports. Competition just got harder in India, where Uber competitor Ola has acquired another rival named TaxiForSure for \$200 million, [TechCrunch](#) reports.

Bitcoin the currency may be down, but don't count the technology out, argues Duke University professor [Campbell Harvey](#). Small bitcoin mining operations aren't doing so well amid the currency's boom and bust cycles, reports [the New Republic](#). [The New York Times](#) says that data security is one of bitcoin's biggest draws. But keep in mind that hackers used Tor to infiltrate services such as Blockchain.info and LocalBitcoins to steal bitcoins, [Forbes](#) reports.

Scientific American

April 1, 2015

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Cryptocurrency Exchanges Emerge as Regulators Try to Keep Up

Trust issues plague bitcoin and other digital currencies. Licensed exchanges could change that

By Larry Greenemeier | April 8, 2015 | Véalo en español

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Bitcoin-Based Blockchain Breaks Out

Virtual currencies such as bitcoin rely on this digital public ledger system to guard against fraud, an approach that could likewise secure the coming Internet of things

By Larry Greenemeier | April 1, 2015

April 8, 2015

Campbell R. Harvey 2015

13

Money Magazine

February 24, 2015



and it's verified through this common ledger. The car is able to identify that it is your car, and so the car starts. You're done.

Now suppose you borrow money from the bank for the car and you're three months behind in your payments. You present your key, the car doesn't start. The bank has the key that starts the car. So this is a very cool idea, right?

There's still a problem with the roller-coaster ride in Bitcoin prices, right?

There is, and Bitcoin currently is not a reliable store of value because of it. But the price

pretty sure it's a worst New

currency. What don't people get?

Almost everything. For instance, part of the misunderstanding is the focus on the price of the Bitcoin. You see that it was at \$1,000, then it's down to \$200. People say, "Well, the bubble has burst," and stuff like that.

Bitcoin is safer?

Bitcoin is much safer. When you go to buy something, the retailer actually is able to check a common ledger of all transactions to make sure you actually have the money to spend. The public ledger, which is almost impossible to hack, solves the

swings could be solved with more liquidity—more money in the market. The recently launched Bitcoin exchange, which is fully regulated, insured, and backed by the New York Stock Exchange, should help with this. Bitcoin price fluctuations are a factor of it being so young.

Bloomberg Magazine

October, 2015



Campbell R. Harvey 2015

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September 15, 2015 12:42 pm

Blockchain initiative backed by nine large investment banks

Philip Stafford

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Nine of the largest investment banks, including [Goldman Sachs](#), [JPMorgan](#) and [Credit Suisse](#), are planning to develop common standards for blockchain technology in an effort to broaden its use across financial services.

The group are looking to channel data, ideas and financial backing to a start-up called R3CEV, a New York-based group of trading and technology executives.

<http://blogs.wsj.com/digits/2015/09/03/ubs-building-virtual-coin-for-mainstream-banking/>

The follower

August 24, 2015

NEWS • TECHNOLOGY

Stanford Joins NYU and Duke in Offering Bitcoin Course

Grace Caffyn (@GCaffyn) | Published on August 24, 2015 at 12:17 BST

NEWS IN BRIEF



Stanford is joining NYU and Duke University in offering a course on bitcoin – kicking off with a free security webinar tomorrow.

Student Ventures

Co.insure
Health Insurance on the Blockchain

Daniel Chander, Michael Ide, Rajan Patel, Prashanth Rajendran

BitMart
The pre-owned marketplace for E-Books
Seeking \$70M

Kevin Kalkwarf
Dennis Park
Diana Stan
Eric Yin

ComplyChain

Anthony Alvermaz
Ian Hathaway
Pushkar Prateek
Devin Solanki

PresCrypt & RXchain

April 23, 2015
Hunter Cardwell (Fuqua)
Harrison Richard (Trinity)
Mitesh Tank (Fuqua)

Crypto-Secure
For digitized, secure and accurate credit information
I&E 550
Prianka Rauniyar, Shreya Vora, Arun Karottu, Tanaka Jimha
Duke University

BitTrax
Melissa Zhang
Scott Roulston
Avi Moondra
Trevor Kiviat

Duke INNOVATION & ENTREPRENEURSHIP

EQUICHAIN
Chris Boone, Ryan Lanman, Emanuele Macchi,
Marie Hasse

4/23/15

BLOCKTITLE
Chip Blue, Sharon Fang, Lalita Maraj, Will Ranish
April 24th 2015

PORTOL
Control your media.

Student Ventures-Confidential

No photos of slides please

Conclusions

First course ever offered focused on blockchain technology

- We are seeing only the tip of the iceberg in terms of innovative ideas
- Most people have heard of bitcoin; few understand blockchain
- Big opportunity for new ventures