Cryptocitizen:

Smart Contracts, Pluralistic Morality, and Blockchain Society

Phoenix AZ, May 27, 2015

Slides: http://slideshare.net/LaBlogga

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Institute for Blockchain Studies

SINGULARITY UNIVERSITY

Thesis

Blockchain technology is not just about cryptocurrencies, registering wills and IP on blockchains, and bank transfers taking less than 3 days to settle, philosophically blockchains invite a new level of thinking about the sensibility of the Cryptocitizen and possibilities for societal design

http://www.amazon.com/Bitcoin-Blueprint-New-World-Currency/dp/1491920491

Agenda

- Introduction
- Part I
  - Smart Property and Smart Contracts
  - Cryptolaw and the Cryptocitizen
- Part II
  - Smartnetworks and Consensus Trust
  - Pluralistic Morality and Enacting Friendly AI
  - Design Space of Digital Society
- Conclusion

Melanie Swan, Blockchain Scholar

- Founder, Institute for Blockchain Studies
- Singularity University Instructor, EDGE Contributor
  IEET Affiliate Scholar

- Swan, M. ***Blockchain: Blueprint for a New Economy***. Sebastopol CA: O'Reilly Media, 2015.
- Swan, M. ***We Should Consider The Future World As One Of Multi-Species Intelligence***. Response to The Edge Question 2015: What do you think about machines that think? John Brockman, Ed., 2015.
- Swan, M. ***Cognitive Applications of the Brain as a DAC***. Cognitive Science 2015: The Annual Meeting of the Cognitive Science Society: Mind, Technology, and Society, Pasadena CA, July 2015. submitted.
- Swan, M. ***Philosophy of Big Data: Expanding the Human-Data Relation with Big Data Science Services***. *IEEE BigDataService 2015*, Redwood City CA, Mar 31-Apr 2, 2015.
- Swan, M. ***Blockchain Thinking: The Brain as a DAC (Decentralized Autonomous Corporation)***. Texas Bitcoin Conference, Austin TX, March 27-29, 2015.
- Swan, M. ***Machine ethics interfaces: An ethics of perception of nanorobot-aided cognition***. Journal of Responsible Innovation. submitted.

Traditional Markets, Science, Arts Background

Wharton University of Pennsylvania

J.P.Morgan Fidelity Investments

DIYgenomics

genomera

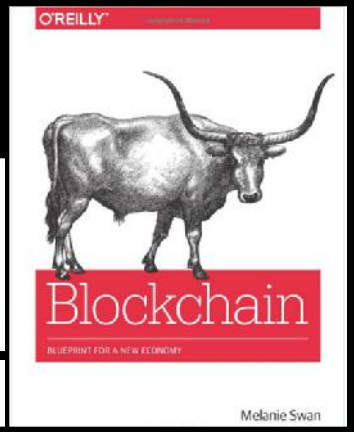
Digital Art and Philosophy

University of the Commons

New Vision

Institute for Blockchain Studies

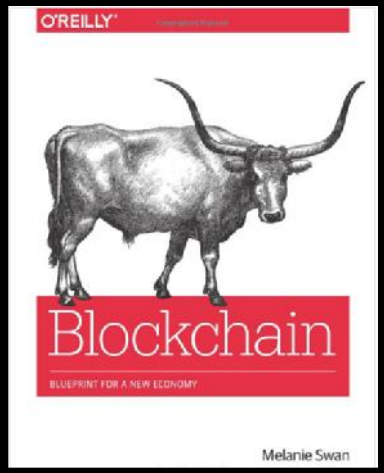
Singularity University



http://melanieswan.com/publications.htm, http://www.amazon.com/Bitcoin-Blueprint-New-World-Currency/dp/1491920491

Blockchain (non-technical overview of blockchain possibilities)

- What people are saying…
  - #mindblowing – SD
  - Instrumental – SG
  - Intriguing - JH
  - Great to read your book! Willing to transform your ideas to real life – AW
  - I find it amazing … a good mix of explanation about state-of-the-art products as well as visionary ideas. I was waiting for awhile for this kind of book – JM
  - A compelling and unique overview of the possibilities – DC
  - Thank you for helping bring about a new era in finance – JW



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Bitcoin-FinTech-Blockchain Growth

The Economist

Blockchain

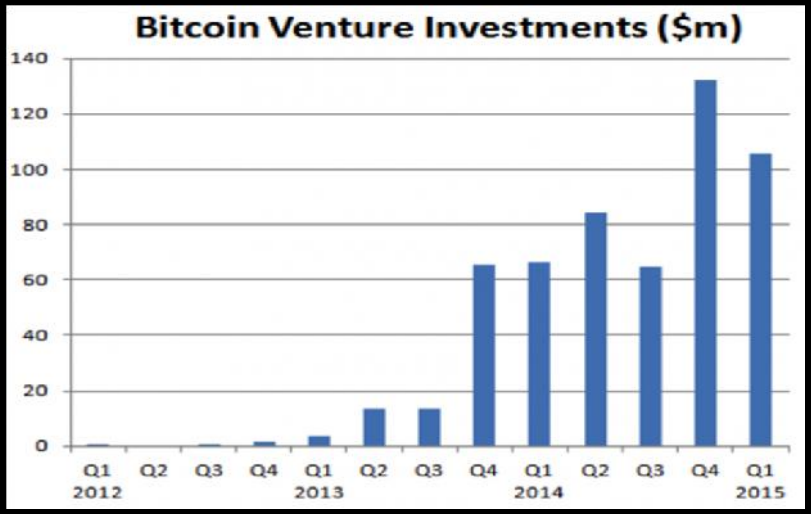
May 9th 2015

The next big thing

MIT Technology Review

Why Bitcoin Could Be Much More Than a Currency

May 8, 2015



Nasdaq

Nasdaq Launches Enterprise-Wide Blockchain Technology Initiative

May 11, 2015

Goldman and IDG Put $50 Million to Work in a Bitcoin Company

CIRCLE

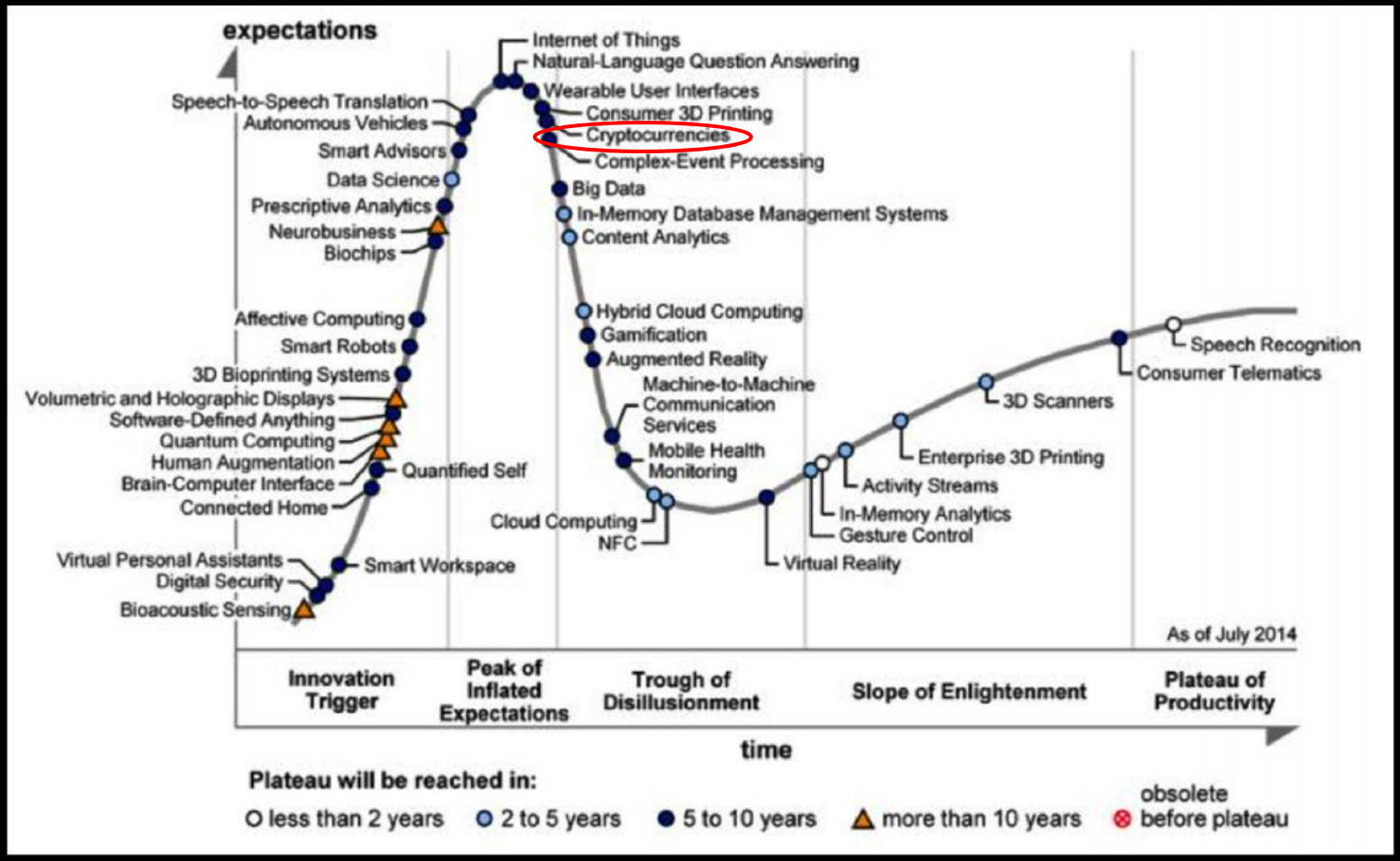
APRIL 30, 2015

Silicon Valley Bank: Global investment in FinTech is set to double from $10 billion in 2014 to $19.7 billion in 2015, and reach $46.1 billion by 2020

https://angel.co/bitcoin, http://thefinanser.co.uk/fsclub/2015/02/the-fintech-scene-is-so-hot-its-boiling.html
http://thenextweb.com/insider/2015/04/16/bitcoin-is-the-worlds-most-dangerous-idea/

Gartner Emerging Technology Hype Cycle

Cryptocurrencies added July 2014



http://thenextweb.com/insider/2015/04/16/bitcoin-is-the-worlds-most-dangerous-idea/

What is a Blockchain?

- A decentralized database/transaction ledger
  - A giant ‘interactive Google doc spreadsheet’ that anyone can view on-demand and administrators (miners) continually verify and update to confirm that each transaction is valid
  - A shared truth state in a distributed system
  - Etymology: blocks (batches) of transactions posted sequentially to a ledger, referencing the prior block (chain)
- Implication: secure network where any transaction can be independently confirmed as unique and valid without a centralized intermediary (implies greater scale possible)

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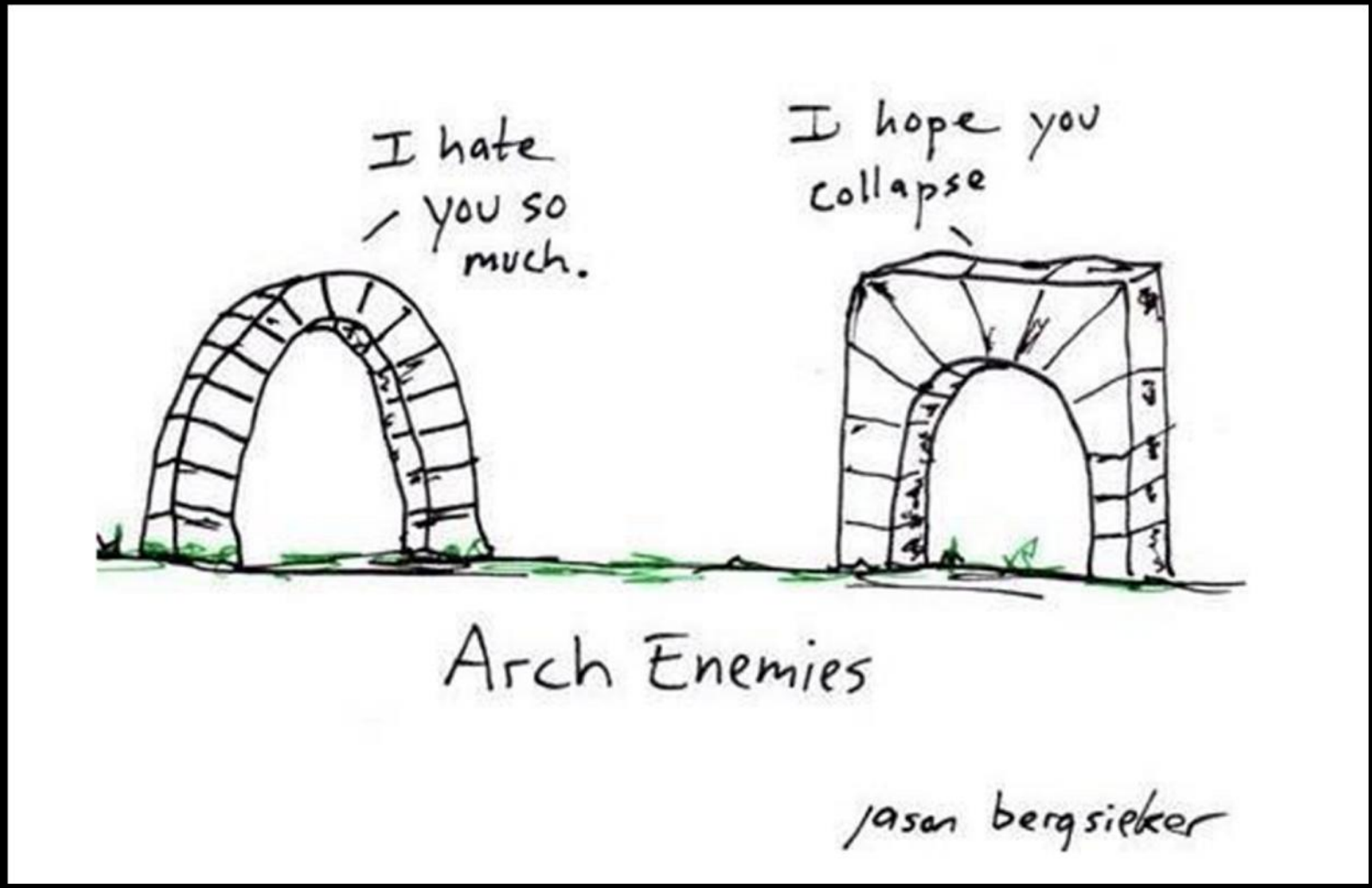
Two modes: Improvement and Revolution

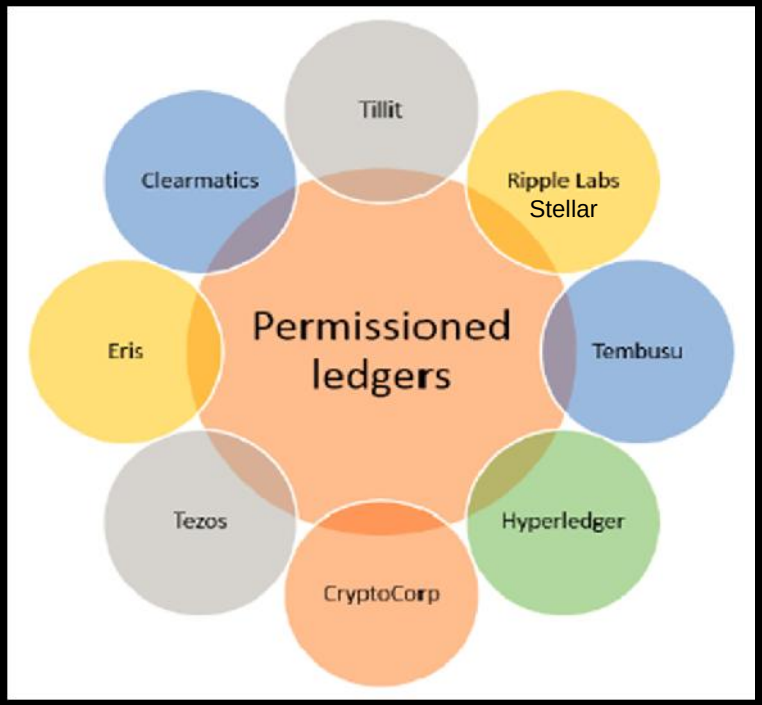


https://twitter.com/matteastwood/status/594603199685926913/photo/1

Two modes of Blockchain Apps: Enterprise (Improvement) and Individual (Revolution)

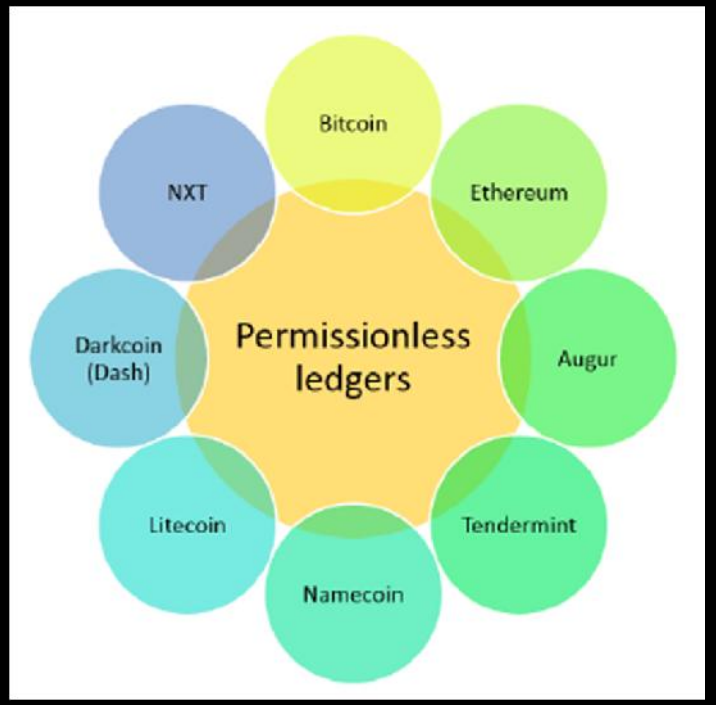
Enterprise (improvement)

- Permissioned ledgers; private
- Identity known/confirmed, legally-compliant
- 'Reinvent the existing world' efficiency improvement, eliminate intermediaries
- Decentralized SaaS



Individual (revolution)

- Permissionless ledgers; public
- Censorship-resistant (pseudonymous)
- 'Brave new world' apps
- Anonymous validators (network vulnerable to anonymous attack)



http://www.slideshare.net/lablogga/blockchain-consensus-protocols
Charts per: http://www.ofnumbers.com/wp-content/uploads/2015/04/Permissioned-distributed-ledgers.pdf

Example: Smarthome IOT blockchains privately monitor physical and mental status

Enterprise Blockchain Apps by Sector (selected)

Economics and Markets	Government & Legal	IOT	Health	Science, Art, AI
• Currency • Payments & Remittance • Banking & Finance • Clearing & Settlement • Insurance • FinTech • Trading & Derivatives • QA & Internal Audit • Crowdfunding	• Transnational orgs • Personalized governance services • Voting, propositions • P2P bonds • Tele-attorney services • IP registration and exchange • Tax receipts • Notary service and document registry	• Agricultural & drone sensor networks • Smarthome networks • Integrated smartcity, connected car, smarthome sensors • Self-driving car • Personalized robots, robotic companions • Personalized drones • Digital assistants	 • Universal EMR • Health databanks • QS Data Commons • Big health data stream analytics • Digital health wallet • Smart property • HealthToken • Personal development contracts	• Community supercomputing • Crowd analysis • P2P resourcenets • Film, dataviz • AI: blockchain advocates, friendly AI, blockchain learners, digital mindfile services
Crucial Blockchain Properties				
• Cryptoledger • Decentralized network • Trustless counterparties • Independent consensus-confirmed transactions	• Permanent record • Public records repository • Notarization time-stamping hashes • Universal format • Accessibility	• Communication (messaging) • Large-scale coordination • Entity ingress/egress • Transaction security	• Universal format • Large-scale multi-data-stream integration • Privacy and security Real-time accessibility	• Large-scale infrastructural element for coordination • Checks-and-balances system for 'good-player' access

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Smart Property and Smart Contracts

- Implications: a future of cryptographically-activated assets and actions…
- …physical and intellectual property might be registered and transacted via blockchains as *smart property*, and
- …agreements, contractual relationships, societal record-keeping, and governance might be enacted through code-based *smart contracts*

What is Smart Property?

PROVENANCE

OpenBazaar

- Register assets to blockchain via unique key
  - Real-time GPS ‘LoJack’ tracking for any asset
- Blockchain becomes an inventory, tracking, and exchange mechanism for hard assets
- Smart Property example projects
  - *Blocktrace* ledger tracks diamonds
  - *Provenance.org* tracks supply chain authenticity
  - *OpenBazaar* decentralized Craigslist exchange
  - *Factom-HealthNautica* medical billing and claims
  - Drug and equipment inventory, including origin and servicing records

https://openbazaar.org/, http://www.edgelogic.net/blocktrace, Provenance: https://www.youtube.com/watch?v=SqIUBn80pg4
http://cointelegraph.com/news/114053/factoms-latest-partnership-takes-on-us-healthcare

Smart Property - Intangible

- Notary Service, Attestation
  - Register contracts, agreements, wills (Proof of Existence, Factom)
  - Register, protect, and transact IP (Monegraph, Ascribe)
- How it works
  - Hash + timestamp + blockchain record

Proof of Existence | Prove | About | API | Contact

Last documents confirmed in the blockchain:

Document Digest	Timestamp
26fa546a234d7b9d0f3a4e2508ba41da86029e4b079c8fc1c8ae2c4c8524460f	2015-04-05 13:36:49
581a5d5d1adaa17ec099acdb4a5394fd49acdae73478354cf30b8296a538ac43	2015-04-05 11:14:35
3737f980f7aed1d0de2535664a7b311867840e21efef9b588d3eff35f9265e67	2015-04-04 03:00:45
a8e3711de203d01fb9c5216d8072d43638c4e4fa78bde94e7875e14367a38e98	2015-04-04 01:41:02

http://www.proofofexistence.com/

What are Smart Contracts?

- Agreements between parties posted to the blockchain for automated execution
  - Human-human interaction
  - Technological-entity operation
- Patterns of interaction in society
  - Software models most world systems now
  - Software services can encode these patterns (smart contracts as decentralized SaaS) to facilitate the patterns of human interaction
    - Example: Starbucks facilitates the pattern of coffee for tokens exchange
- Code Projects: Ethereum, Etherparty, Eris

ETHER PARTY

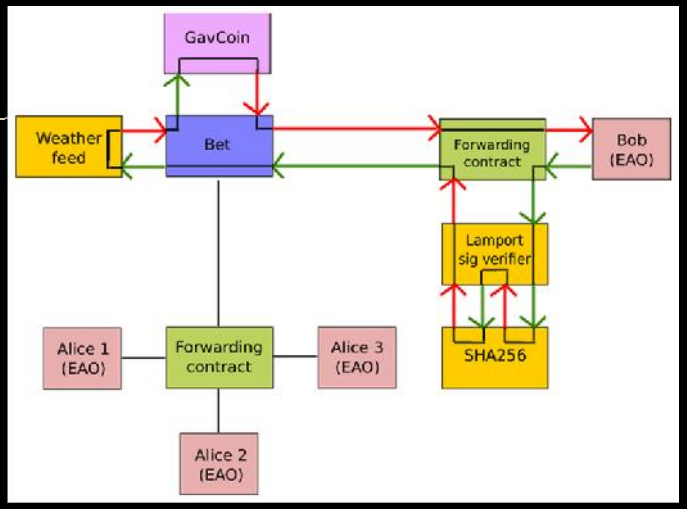
ethereum

eris

Woods, G.; https://www.youtube.com/watch?v=Q2CNayXbRKI, http://financialcryptography.com/mt/archives/001555.html, https://eng.erisindustries.com/smart%20contracts/2014/12/17/dennys-smart-contracting/ , http://forum.ethereum.org/discussion/1402/how-to-get-started-your-first-dapp-under-one-hour,

Smart Contract examples

- Bet on high temperature
  - Intermediary removed
- Mortgage interest-rate resets
- Inheritance pay-out
  - Age 21 or death of benefactor
- Blockchain-based Greek tax receipts in Ricardian Contracts (Yanis Varoufakis)
- Peer-to-peer insurance
  - Dynamis http://www.dynamisapp.com
  - BitSilk https://twitter.com/bitsilk
- Mediation and legal services
  - Precedent http://www.precedentcoin.com



Weather Bet (Ethereum)

http://www.amazon.com/Bitcoin-Blueprint-New-World-Currency/dp/1491920491
https://github.com/ethereum/wiki/wiki/Ethereum-Development-Tutorial

Smart Contract Law Firm?

Robot Robot & Hwang

- "Law is something to be radically reshaped by the emergence of technology, it is about the management and manipulation of data on an entirely new scale" - *Richard Susskind*

ATTORNEYS

Apollo Cluster, Partner

Apollo Cluster is a senior partner and a co-founder of Robot Robot and Hwang. His practice specializes in mergers and acquisitions, where he has represented a variety of public and private companies in the emerging technologies space. In his time at RRH, he has processed more than 10 million unique transactions for clients. He holds a J.D. from Harvard Law School and was a clerk for Justice Richard Posner on the 7th Circuit. He is a frequent lecturer at Stanford University at PLI and at other continuing legal education seminars on the topic of the obsolescence of humans in legal practice and mankind generally.

"Daria" XR-1029, Partner

XR-1029 is a senior partner in litigation at Robot Robot and Hwang and a co-founder of the firm. She specializes in intellectual property issues and has handled hundreds of thousands of complex commercial transactions for Internet and other technology companies, with a particular focus on copyright and trade secret law. XR-1029 has experience in all stages of litigation, in both federal and state courts, where she has also served as an expert witness in a variety of cases. She holds a J.D. from UC-Berkeley's Boalt School of Law and an LLM from Stanford Law, where her journal publication, *On the Computational Predictability of the Judicial Process*, garnered multiple rewards. In 2008, she was named a Northern Californian *Super Lawyer*.

Tim Hwang, Partner

Tim Hwang is a junior partner at Robot Robot and Hwang, specializing in legal engineering and development. He formerly was a researcher at the Berkman Center for Internet and Society. He is the founder of The Web Ecology Project, The Awesome Foundation, ROFLCon, and was a co-host on The Tim & Diana Show.

http://www.robotandhwang.com/attorneys/

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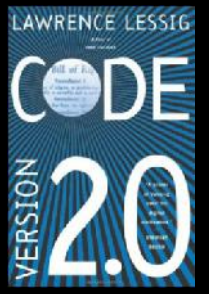
Technologically-binding vs. Legally-binding

- Different frameworks
  - Technologically-binding: Inexorably executing code contracts (Lessig: "code is law") that cannot be breached, and will proceed unstoppably even if conditions have changed
  - Legally-binding: Discretionary compliance, semantic flexibility of human-partied contracts

- Key shift: Auto-executing code could become prevalent not anecdotal (mortgage industry)



Cryptolaw

- Intersection of technological (inexorable, uninfringeable) and legal frameworks (flexible)
- Separate legal system needed for smart contracts?
  - Smart contract regulation: impossible to enforce smart contracts with current law
  - Example: a decentralized program already launched and running is difficult to control, regulate, or sue for damages
- Smart contracts impact not just contract law, but more broadly social contracts within society
  - What kind of social contracts do we humans want with technological entities?

Cryptolaw: Two modes of Smart Contracts

- As with blockchain applications, two types (enterprise and individual)
  1. Compliant legal contracts with mutual assent, consideration, capacity, and legality
     - Features such as: kill switch, consumer protection, assurity funds escrowed, identity transparency
  2. 'A-compliant': operating in 'a-legalilty' outside of current regulation
- Involved parties, are you transacting with a legal entity?
  - A. human-human B. human-entity C. entity-entity
  - Technological entities (DOAs) could become new form of legal entity like a corporation

DAO: Distributed Autonomous Organization
https://www.youtube.com/watch?v=Q2CNayXbRKI

Cryptolaw and Societal Design Implications

- Emerging that we need new ways of building societal shared trust through:

1. Transparency
2. Legal frameworks that are still relevant, but perhaps enacted at the level of the contract (not federal/state)
   - Not lawlessness, legal framework as a selectable parameter like jurisdiction (like Creative Commons license drop-downs)
3. More becomes ‘legal’ since monitoring is impossible
   - More tolerance of existing patterns of interaction in society
     - Result: Less deception; more truth, transparency, disclosure, acknowledgment
   - Everyone in the system is taking part consensually
     - Result: more self-determination of societal participants

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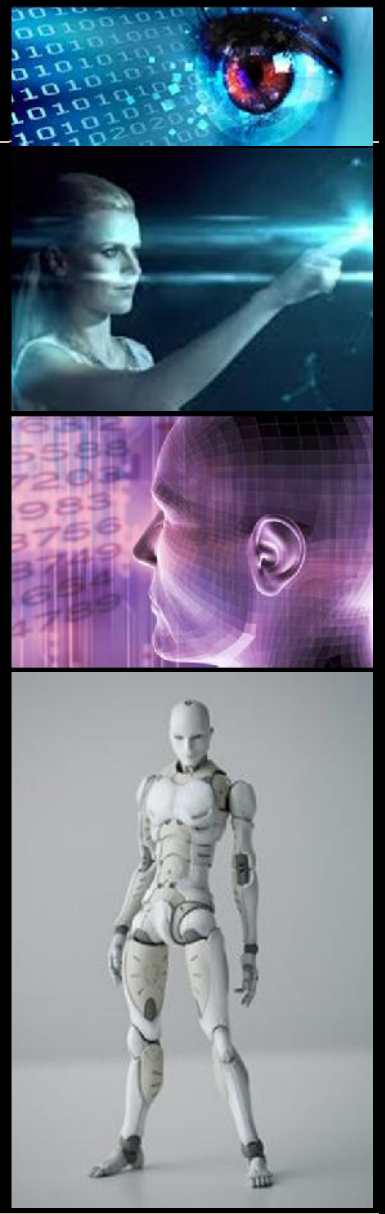
Cryptocitizen Sensibility

- A new relationship with authority and responsibility-taking; embodying what it is to be a ‘Cryptocitizen’ ranging from
  - Digital wallet security practices like backing up our money, to…
  - Self-authority responsibility-taking
    - Governance services vs. being governed
    - Trend: happened with news media, entertainment, stock-trading, health services; now happening with money, economics, governance and legal services
- Blockchain technology is liberty-enhancing, promulgating Cryptocitizen sensibilities for authority-taking



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Smartnetworks

- *Smart property* and *smart contracts* are just one manifestation of blockchain technology
- Blockchains shift communications networks from dumb to smart
- What is being created is *smartnetworks*, communications networks that confer a truth state of reality, wherein trust is built, such that there are new possibilities for us as individual agents and societies
  - Builds societal shared trust

Source: http://futurememes.blogspot.com/2015/01/blockchain-consensus-models-increase.html

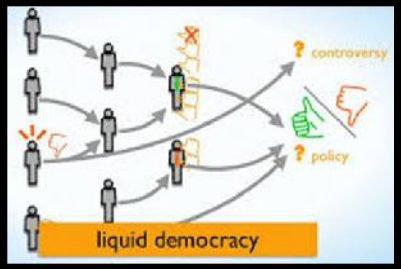
Levels of Information (Modulated by Quality)

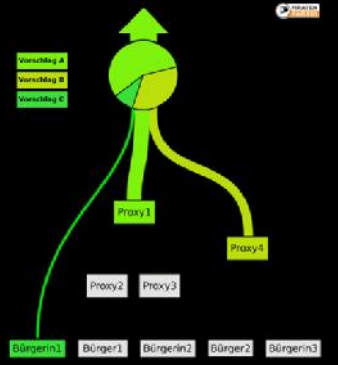
- Levels of information
  1. 'Dumb,' unenhanced, unmodulated data: initial default
  2. Socially-recommended data: data elements enriched by social network peer or expert recommendation
  3. Consensus-validated data: recommendation based on group consensus, a formal structure of agents forming a consensus about a reality state; not just a peer recommendation, an actual truth state of the world
- The affirmed quality of information builds trust
  - This quality of information has a higher level of trust associated with it; high-resolution modulation regarding the quality, authenticity, and provenance of information
  - Impersonalizes and scales trust:
    - Trusting systems not people

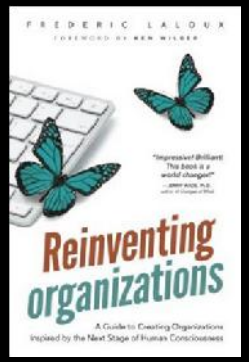
Source: http://futurememes.blogspot.com/2015/01/blockchain-consensus-models-increase.html

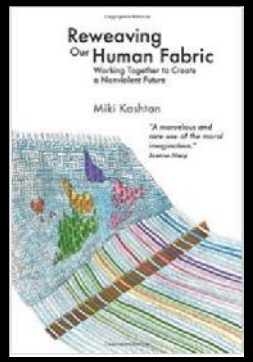
Consensus Trust improves Effectiveness

- What consensus trust enables is several things including effectiveness
  - Building shared societal trust enables the interrelation of participation, transparency, and importantly, effectiveness
  - Argument: everyone wants transparency, but not everyone wants to participate, for example in voting and decision-making
  - Transparency and possibility is effectiveness
  - Examples:
    - Delegative democracy (Liquid Democracy)
    - Futarchy (two-step prediction market voting)
    - *Reinventing Organizations*
    - *Reweaving our Human Fabric*









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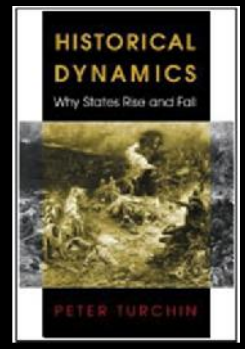
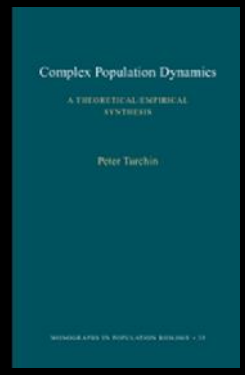
Consensus Trust enables the Qualitative

- Blockchains as an equality technology for illiberty eradication; blockchain neutrality
- Access the qualitative, the intangibles within a system fluctuating, regressing over time:
  - Cliometrics (Turchin) to measure inequality in historical political systems; measure liberty, choice, autonomy, authority-taking, and equality
  - Complexity math to measure and impute utility functions, quality of time spent in different activities (fractal behavior, power laws, high coefficients, nearest neighbors, Eigenvalues)
- How? Participants trusting the system are more willing to share data about qualitative variables
  - Directly or via QS/smarthome data feeds

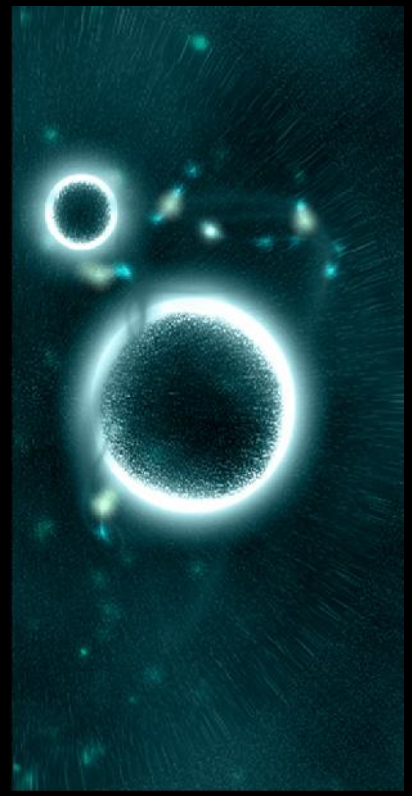




Turchin, P., http://aeon.co/magazine/society/peter-turchin-wealth-poverty/; Swan, M. Cognitive Applications of Blockchain Technology; Swan, M. Blockchain Thinking: The Brain as a DAC (Decentralized Autonomous Organization); Swan, M. Illiberty Eradication http://futurememes.blogspot.com/2014/03/illiberty-in-biohacking-personal-data.html

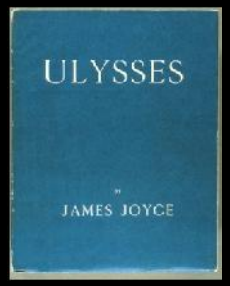
Consensus Trust empowers Entities

- Allows a fuller empowerment in the interaction
  - Any interaction is a discovery and exchange
- Consensus is not just about information quality, assurance, and validation, it is about the relation between entities in a network, the interaction structure and quality
  - You-me in this conversation, or
  - Intelligent entities who do not know each other in a digital society interacting on a smartnetwork
- Expands what is possible in interactions, an abundance mentality of injecting empowerment and acknowledgement into interactions, assents, confirmations, exchanges



Swan, M. "Blockchain Thinkers and Smart Contracts to take over the World?", March 20–21, 2015, The Work of Cognition and Neuroethics in Science Fiction, Center for Cognition and Neuroethics, Flint MI

Derrida: Ontology of Joycean Consensus



- Affirmation is not solo, “saying yes” is dependent upon another to hear it and acknowledge receipt
- The affirmation relation is liberty-enhancing and totalization-resisting, the affirming and acknowledging parties, and the yes itself, remain distinct
  - “*The two responses refer to each other without having any relationship between them. The two sign yet prevent the signature from gathering itself together [totalizing].*”
    - The *yes* “*addresses itself to some other which it does not constitute*”
    - The *yes* avoids its own totalization, “*The yes, by responding and countersigning, does not let itself be counted or discounted [totalized]*
- Well-formed consensus: preserve the integrity of entities in a network of ad-hoc relations

Derrida. Ulysses Gramophone: Hear Say Yes In Joyce. Pp. 267, 296.
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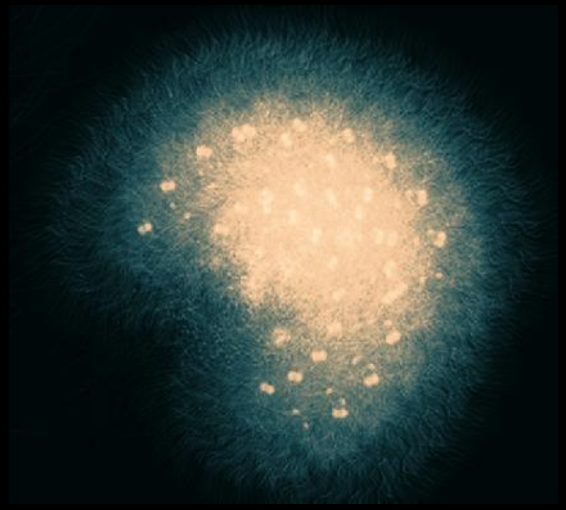
Smartnetwork Applications: Friendly AI

- Argument…

1. Digital intelligences will be running on consensus-managed smartnetworks
2. Good reputational standing is required to conduct operations
   - Resource access, fund-raising, services-providing, contracts
3. Consensus only validates and records bonafide transactions from ‘good’ agents
4. Therefore all agents ‘good’



Swan, M. Cognitive Applications of Blockchain Technology. Cognitive Science 2015: The Annual Meeting of the Cognitive Science Society: Mind, Technology, and Society, Pasadena CA, July 2015. submitted. Swan, M. Blockchain Thinking: The Brain as a DAC (Decentralized Autonomous Organization). Texas Bitcoin Conference, Austin TX, March 27-29, 2015. accepted.

Smartnetwork Tyranny?

- Do decentralized trust networks result in the tyranny of a monolithic morality? Smartnetwork operations coordinated by consensus models could be …

A. …positive, an enforcement mechanism for cooperative bonafide players in a moral society, including friendly AI

B. … terrifying (or at least potentially liberty-circumscribing or normalizing) that any one entity might be dependent on the monolithic crowd to conduct even the simplest of network operations

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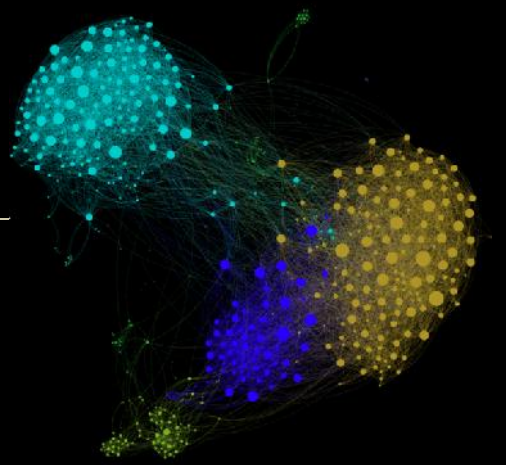
Pluralistic Morality



- Need a system with universality and global scale that simultaneously celebrates and incorporates the richness of agent diversity
- One idea: use the decentralization attribute of blockchains to establish reputation communities
  - Peer-vouched reputation: community peers (geographical or otherwise) vouch for our reputation and can be rewarded if they vouch correctly (reinforcing feedback system)
  - Potential applications: decentralized credit bureaus, open-source FICO scores
- 'Local' reputation communities and global infrastructure are thus included in one liberty-enhancing tyranny-avoiding model

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Reputation and Identity

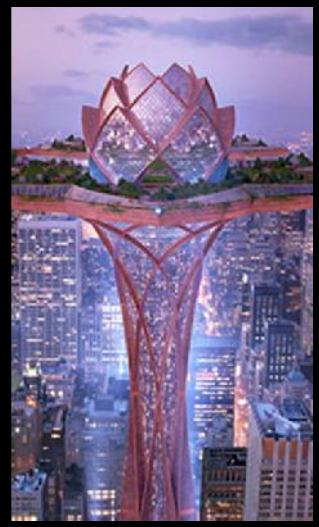
- Constructs of identity
  - Social (forgive-forget, redemption, reinvention, memory=imperfect)
  - Technological (on-demand memory of all artifacts forever)
    - Fourth-person perspective: connected world's continuous witnessing (QS gadgetry, IRC, Facebook, Gorgon Stare)
- Identity: something intrinsic or 3rd party-bestowed?

Antonopoulos, AM and Ellis, C. (2014). Let's Talk Bitcoin #160: The Philosophy of Identity.

Post-Entity Reputation

- Digital identity might become so distributed, portable, copiable, open-sourceable, sharable, malleable, and shardable, that it no longer makes sense to think in terms of entities
- How to enable smartnetwork operations in a post-entity society, perhaps one in which ‘ephemeral instances of capability and creativity’ have replaced identity-bounded entities?
- Reputation could still matter
  - Even if not a full-fledged identity-entity, any instance, any measurable quantum, any participation no matter how ephemeral could still have a reputation

Reputation as Background of Collaboration



- More granular reputations, measuring…
  - Multiple levels like actor, action, and intention
  - Line-item credit for contributions and new ideas
  - Composite reputations for group collaborations
- Blockchains facilitate, automate, and make unobtrusive such tracking, especially ‘quiet background tracking’
  - Preserves focus on collaborative participation, comfortable that credit/contribution-tracking is occurring
- Example: Stross’ *Accelerando* – distributed trust networks and reputation markets, blockchain models have digital copies “*watching over their originals from the consensus cyberspace of the [smart] city*”

Blockchain Philosophy

- Liberty-enhancing
  - Participative, inclusive, expansive, transparent, effective, global-scale
- Equality technology
  - A flexible structure accommodative of diverse value systems
  - Eradicates illiberty
- Authority: shifts locus to individual
  - Already: news, entertainment content, stock-trading, quantified self
  - Now: currency, economics, government
- Decentralization effects
  - Abundance mindset

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- Introduction
- Part I
  - Smart Property and Smart Contracts
  - Cryptolaw and the Cryptocitizen
- Part II
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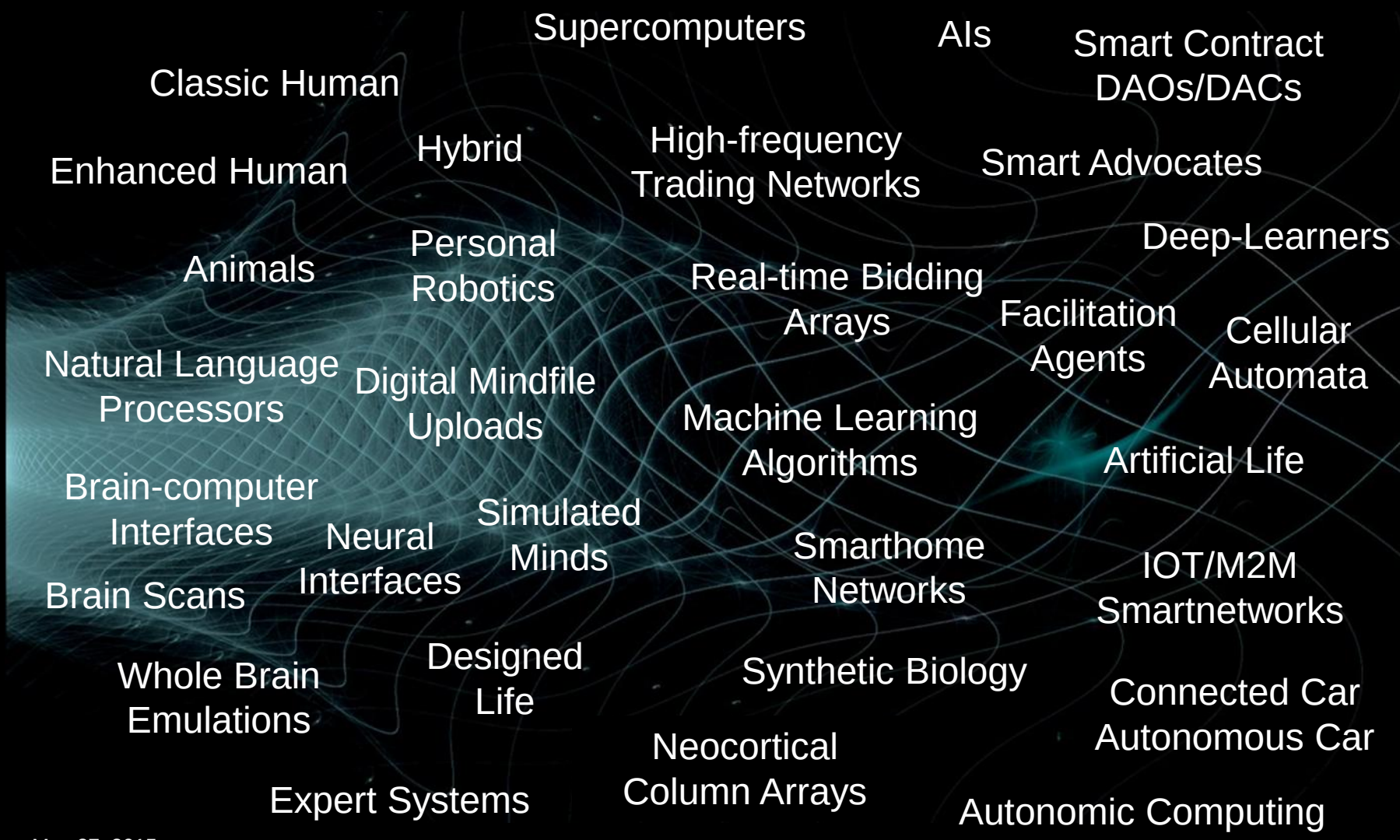
  - Design Space of Digital Society
- Conclusion

Future of Diverse Smartnetwork Entities



Source: http://futurememes.blogspot.com/2015/01/blockchain-thinking-transition-to.html
http://www.slideshare.net/lablogga/brain-as-a-dac-swan

Design Space of Digital Society

- Design requirement: not just pluralistic human morality but environments for diverse entity interaction
- Need a universal framework for coordinating activity (with a focus on capacity not morphology), for a variety of ‘intelligent’ or ‘capable’ agents to be in interaction coordinated by smartnetworks, consensus mechanisms, and blockchains
  - Resource exchange transactions
  - Collaborations (intelligence or other resource shards contributed to projects; post-entity interaction)
  - Confirmation, advocation, and assurity of reality environment
    - Smart contracts as independent third-party advocates
    - Digital intelligences can confirm reality environment

Source: Swan, M. ***We Should Consider The Future World As One Of Multi-Species Intelligence.*** *Response to The Edge Question 2015: What do you think about machines that think? John Brockman, Ed., 2015.*

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Summary - 1

- Blockchains are an important new form of information technology, a decentralized infrastructure and organizational system that is universal, global, secure, and granular
- Two categories of blockchain applications
  - Compliant enterprise applications improving the existing world (better horse) and brave new world applications aimed at individuals (car)
- Smart property and smart contracts could significantly shift the registration, handling, and transacting of physical and intellectual property; agreements, contracts, records, and governance

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Summary - 2

- Cryptolaw is the intersection of technological (inexorable) and legal frameworks (flexible)
- Growing sensibility of the Cryptocitizen in self-authority responsibility-taking
- Smartnetworks as communications networks that confer a reality truth state and societal shared trust
- Smartnetworks as a checks-and-balances system for orchestrating cooperative bonafide players in moral societies, including sponsoring friendly AI and inclusive and pluralistic morality models
- Digital society design that considers both human plurality and interaction amongst diverse entities

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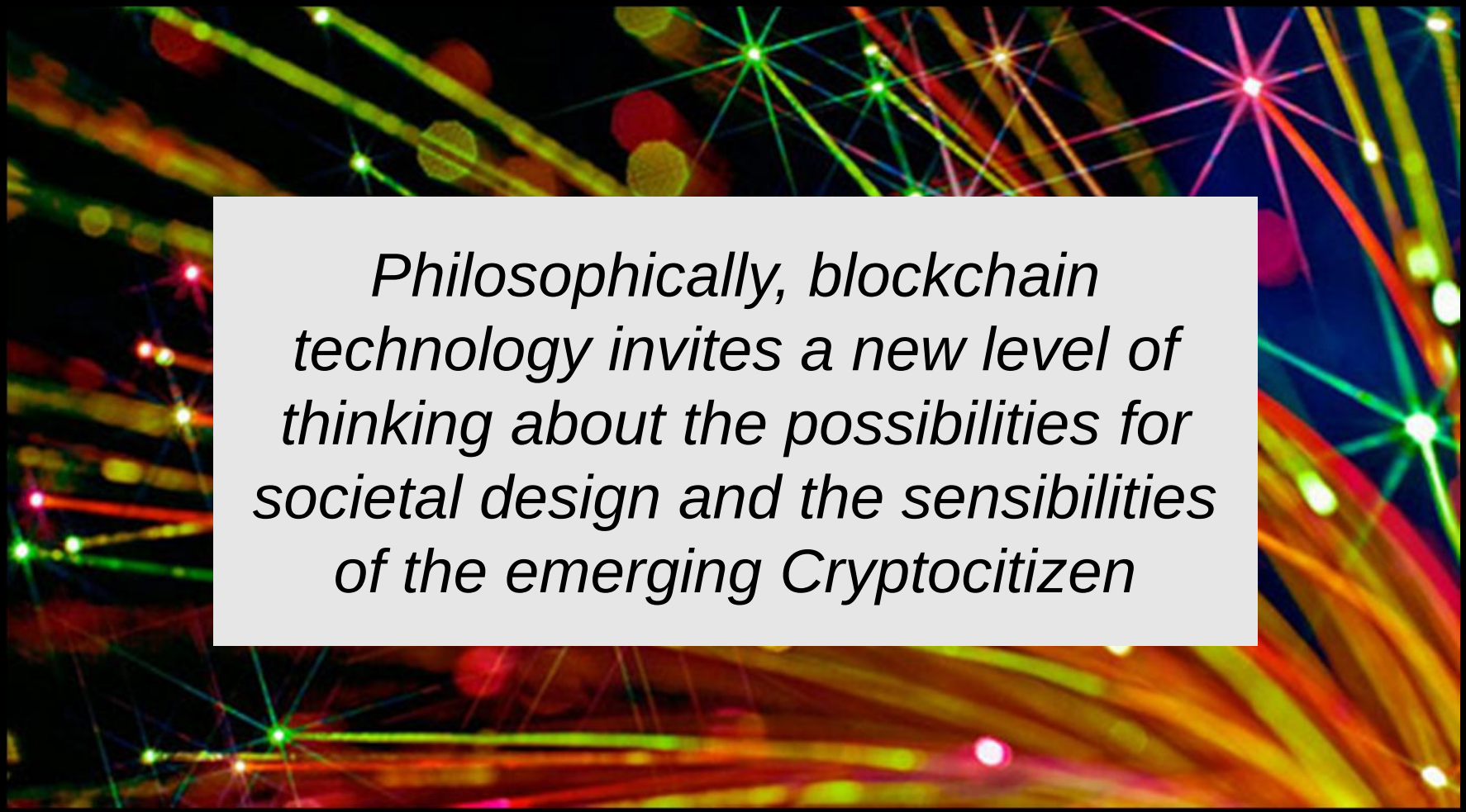
Thesis



Philosophically, blockchain technology invites a new level of thinking about the possibilities for societal design and the sensibilities of the emerging Cryptocitizen

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Cryptocitizen:

Smart Contracts, Pluralistic Morality, and Blockchain Society

Thank you! Questions?

Phoenix AZ, May 27, 2015

Slides: http://slideshare.net/LaBlogga

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