Nil Networks presentation

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Outline I

Outline II

Turing Machines and Information

- Turing Machine as universal model of computation. Theory of Computation.
- Conceptualized around 1940s, still relevant today.
- At around the same time, Mathematical Theory of Communication (Shannon). Leads to Informatics.
- Turing vs. Shannon anecdote.
- Not clear how to unify the fields. Why two theories inside “Computer Science”?

Outline I

Outline II

80 years later...

- In 80 years: many developments, theoretical and technological. programming, cryptography, computer's architecture, computer networks, distributed systems, cryptography, ...
- Very exciting but...the fundamental concepts and theories are still the same. Not a lot of truly scientific breakthrough.

80 years later...

- As a general rule, development has focused in technologies, scalability, products, business models, etc.
- Technological saturation. Big players in the market already established. Hard to continue innovating.
- Quantum Computing: spooky probabilities.
- Today: turning point in this dynamic (apparently, seems necessary...).

Outline I

Outline II

Blockchain...

- Today: turning point in this dynamic (apparently, seems necessary...).
- Blockchain: the "universal" data structure.
- Change the data structure, change the game, change the market.
- Embracing the concept of replication. Somehow, bringing Computer Science to its limits.
- The climate is changing, the Clouds start to leak...

Outline I

Outline II

Cryptography...

- Unification CS and Inf.
- Principles vs. theory.
- General philosophical framework.

Overview of the field/market...

- A lot of technologies already well developed. Market established.
- Possible to start commercializing very abstract concepts.
- Blockchain still quite immature field though. Bitcoin and Ethereum are just the beginning.
- Conceptual work (research) is required to clarify. Systematize, classify, clarify, distinguish....
- This conceptual work is a precondition to establish long-term, profitable business models.

Outline I

Outline II

Working hypothesis. . .

Roughly speaking, the field of this research project can be characterized by the following hypothesis:

1. There is a fundamental connection between Computer Science and Economics: Computer Science provides a solution to the main problem of Economics (the “problem of value”) via a solution to one of the fundamental problems of Computer Science (the Turing test).
2. The concepts of Economics involved in said problem can be coordinated (not necessarily reduced in the strict scientific sense) to concepts in Computer Science.
3. The modern theory of cryptography is a great candidate to address this coordination.

Outline I

Outline II

Some questions to be addressed...

1. Relationship between the Turing test and CAPTCHAs.
2. The Turing test and its relationship to AI today.
3. The principles of modern cryptography as some sort of unification of Computer Science and Informatics.

Turing test and Economics...

1. The scientific status of Economics. Not strictly a science.
2. Economics as a “human science” or “social science”.
3. On the nature of “human being”, or the lack of its scientific determination.
4. The idea that it is sound to take the Turing test as a conducting idea for the investigation, and to test how far we can get in this direction.
5. The connection of all of this with the concept of identity (digital identity).

Outline I

Outline II

Outline I

Outline II

Outline I

Outline II

Communities are technologies

1. No such thing as the universal coin.
2. Target communities, discover/adapt to their identity.
3. Their identity is, for the purposes of our project, the tools that they use.
4. Connect this with the idea of AI and the blockchain.
5. In principle:
    1. Permissioned blockchains more profitable, easier to define business model.
    2. Permissionless blockchains easier to deploy.

Outline I

Outline II

Collaborators, competitors, clients

General:

1. System administration.
2. Database administration.
3. Network administration.
4. Cybersecurity.

Specific (not in identity):

1. Blockchain.
2. Artificial Intelligence.

Competitors

Blockchain and Artificial Intelligence companies working in the specific area of identity.

Business model

Digital identity in blockchain. Providing a service of identificiation. Database administration, computing/information services, consultancy.

Outline I

Outline II

Institutional identity I

1. Government ID. Issues: privacy, low granurality, bureaucracy, limited geography, single point of failure, (scalability).
2. Government Passport. Issues: privacy, low granurality, bureaucracy, limited geography, single point of failure, (scalability)
3. Healthcare system: Medical records, biometrics. Issues: privacy, ethics, high cost, bureaucracy, limited geography, single point of failure, local regulations, standards, scalability.

Institutional identity II

4. Telecommunications Infrastructure: Telephone. Issues: privacy, governmental second-order dependency, low granurality, bureaucracy, (limited geography), (single point of failure), (scalability).
5. Banking infrastructure: Credit card/bank account. Issues: privacy, governmental second-order dependency, (low granurality), bureaucracy, (limited geography), (single point of failure), scalability.

Outline I

Outline II

Non-Institutional identity

1. Cryptocurrencies: Issues (TBD...): (privacy), (governmental second-order dependency), (low granurality), (bureaucracy), (limited geography).
2. CAPTCHAs: Issues: scalability, technical/scientific (AI).

Outline I

Outline II

Main areas/tasks

The project can be divided in the following areas/general tasks:

1. Research (70%):
   1. Basic research (20%).
   2. Applied research (30%).
   3. Communication (20%)
2. Development (30%).

Outline I

Outline II

Main technical/scientific lines

The project would involve the following main technical/scientific lines:

1. AI: Computer Vision, Natural Language Processing, Signal Processing.
2. Distributed Systems.
3. Cryptoeconomics: Blockchain services, Interoperability, Cloud services.
4. Human-Computer Interaction: User Interfaces, App Development.

Outline I

Outline II

Main deliverables

The project would consist of the following main deliverables:

1. Documentation: articles, research papers, technical documentation, blog, social networks.
2. Software: software prototypes, simulations/experiments, application.
3. Raw data: research, simulations/experiments.

Outline I

Outline II

General timeline

The first iteration of the project would last from 3 to 5 years, with the goal of implementing and deploying a first software. Rougly speaking the project could be divided in the following phases:

1. Research: state of the art, basic research, applied research, communication (1-2 years).
2. Development: experimentation, simulation, research, development, integration, testing (1-2 years).
3. Deployment: scale, testing, configuration, deployment, maintenance, monitoring (1-2 years).

Outline I

Outline II

Ley de empresas emergentes

Plan de Recuperación

Summary

- The first main message of your talk in one or two lines.
- The second main message of your talk in one or two lines.
- Perhaps a third message, but not more than that.

- Outlook
  - Something you haven't solved.
  - Something else you haven't solved.