The Socio-Economics of P2P Systems

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Warwick, June 16th, 2011

Peer-to-Peer (P2P) is not a technology.

It is a philosophy.

It runs something like this:

Distributed systems are inherently more efficient, robust and responsive to user needs if functionality, where possible, is decentralized. This means that central control, hierarchy and concentration of resources should be avoided, while peer-level coordination should be encouraged.

Big Picture

- Social science and economics inform the design of P2P systems
- P2P systems change economic realities
- New economic models (commons-based peer production – “wealth of networks” by Yochai Benkler)

Big Picture

- What is important?
  - Increasingly these technologies will structure our social interactions
  - When we design them we make social and economic choices
  - We should be aware of these to inform “good design”
  - Should we design such systems for the common good?
  - What is the common good?

What has sociology or economics got to do with peer-to-peer systems?

- P2P systems *are* socio-economic systems
  - Peers cooperate collectively to achieve their goals
  - No peer in the system controls everything
  - Performance results from interactions
  - At the end-of-day users (people) are in control
  - Sociology and economics has studied such phenomena and systems design benefits from this

OK but what use is this to me?

- Knowing some of the economic background should help you to understand:
  - the basic social/economic theory behind P2P
  - how this informs designs
  - how such designs might be improved
  - how to assess new developments and designs
- It is also a fascinating area in itself:
  - If you are interested you can look-up the terms given in *red italics* on Wikipedia for good introductions

Individualism v. Collectivism

- In socio-economic systems individual interests may conflict with collective interests:
  - e.g. over exploitation of a common resource (a river, a field, the atmosphere etc.)
  - e.g. banks - lending (to those who they know can not repay) to gain a commission by selling on the debt to other banks
  - e.g. P2P file sharing system - downloading more than uploading

Individualism v. Collectivism

- Consider a P2P file sharing system:
  - It is in the *collective interest* for all to upload to others so everyone gets the file quickly
  - But it is in the *individual interest* to save bandwidth by only downloading and hence free-riding on others
  - Free-riding (or free-loading) is a perennial problem in P2P file-sharing systems
  - Any efficient system needs to tackle it in some way

The tragedy of the commons

- These kinds of situations have been termed "commons dilemmas" or "common pool resource dilemmas"
- Called "dilemmas" because we would all be better off if we "did the right thing" but there is an individual incentive to do the wrong thing
- G. Hardin (1968) summarized the issue in his famous paper: "The *Tragedy of the Commons*"
- These kinds of situations occur in P2P file-sharing systems like *BitTorrent*

Talks

- How BitTorrent is informed by a kind of economic strategy
- BitTorrent communities and credit dynamics
- What is socially intelligent ICT (designing for the common good)
- How to replace the banks… ;-)
- Design Space Analysis

How to avoid the commons tragedy?

- Central enforcement of correct behaviour
  - require centralised agencies and policing
  - ability to identify and track individuals centrally
  - not suitable for pure P2P (but used with private trackers)
- Decentralised methods
  - self-policing producing incentives for cooperation
  - do not require centralised coordination
  - more suitable for pure P2P
  - can apply ideas from "*game theory*"

What is game theory?

- A way to mathematically analyse games assuming we know:
  - number of players
  - possible moves they can make (strategies)
  - outcome of game based on players moves (pay-off)
  - desirability of game outcomes for each player (utility)

What game are you playing?

- Games can be categorised into two types:

1) Zero-sum games
   - when one player wins another loses
   - summing the final utilities of players = 0
   - e.g. poker, chess, monopoly etc.

2) Non-zero-sum games
   - utilities do not always sum to zero
   - both players may lose or both may win
   - considered to capture social / economic realities
   - e.g. tragedy of the commons examples

Capturing a commons tragedy with a simple game

- Consider a game composed of two players:
  - each player:
    - has choice of one move (C or D)
    - makes a single move then the game ends
    - does not know how the other will move
    - gets a payoff (or utility) based on how they moved and how the other player moved
  - for certain payoff values this game can, minimally, capture a form of commons tragedy (or dilemma)
  - a classic such game is called the *Prisoner's Dilemma*

The Prisoner's Dilemma - "payoff matrix"

Game is a PD when: $T > R > P > S$ and $2R > T + S$

Player 1 / Player 2	C	D
C	(3) R R (3)	(5) T S (0)
D	(0) S T (5)	(1) P P (1)

The Prisoner's Dilemma - example games

Players =>	P1	P2	P1	P2	P1	P2	P1	P2
Moves =>	C	C	C	D	D	C	D	D
Payoffs =>	R	R	S	T	T	S	P	P
Values =>	3	3	0	5	5	0	1	1
Total =>	6		5		5		2	

A contradiction between collective and individual interests

Game theory says defect!

- Game theory assumes players are:
  - rational - attempt to maximise *their* utility
  - selfish - don't care about the other guy
  - knowledgeable - have complete information
  - clever - have unlimited computational time
- Given these assumptions it can be proved:
  - agents will select equilibria where no player will improve by changing strategy unilaterally
  - many games have such equilibria - by the famous John Nash (so-called *Nash Equilibrium* - NE)
  - the NE for the PD is DD (all defect)

Iterated Prisoner's Dilemma

- Previous example "one-shot" PD but:
  - real world interactions often repeated
  - might meet the guy you just ripped-off in the future
  - allows for more complex sequence of strategies based on past interactions with others
  - can punish someone tomorrow for defecting against you today - "the shadow of the future"
- Iterated PD (IPD) captures this and, as we will see, maps well onto P2P file-sharing protocols like BitTorrent

What is the rational thing to do in the IPD?

- Traditional game theory has trouble here:
  - cooperative equilibria exist in infinitely repeated games but not in finite games of known length
  - many equilibria exist and it is not clear which one would be chosen by rational agents
  - In all cases defection on every round is still a equilibrium even when cooperative equilibria exist
- For these reasons *Robert Axelrod* (political scientist), in the late 70's, decided to find out what kinds of strategies worked well in the IPD by using computer simulation

Axelrod's Tournament - programs as strategies

- Axelrod organised an open IPD tournament:
  - Academics were asked to submit programs (BASIC or FORTRAN) that would play the IPD against each other
  - Nobody knew competitors code
  - The only input would be the on-going past history of the game (a string of C's and D's)
  - The aim was to get the highest score (utility) based on round-robin playoffs between all pairs of programs
  - Axelrod's aim was to see which programs did best against all the others and understand why
  - He wrote-up his results in the famous book "the evolution of cooperation"

Axlerod's Tournament - what happened?

- Basic results were:
  - many strategies were submitted (complex and simple)
  - the one with the highest overall score turned out to be simple: *tit-for-tat* (TFT) or "look back"
  - starts playing C, then "looked back" at the last move made by opponent and copied that move
  - submitted by Psychologist Anatol Rapoport
  - didn't "win" against each strategy but did better overall on average against all strategies
  - TFT mechanism an example of "*reciprocal altruism*" (Robert Trivers)

What has this got to do with BitTorrent?

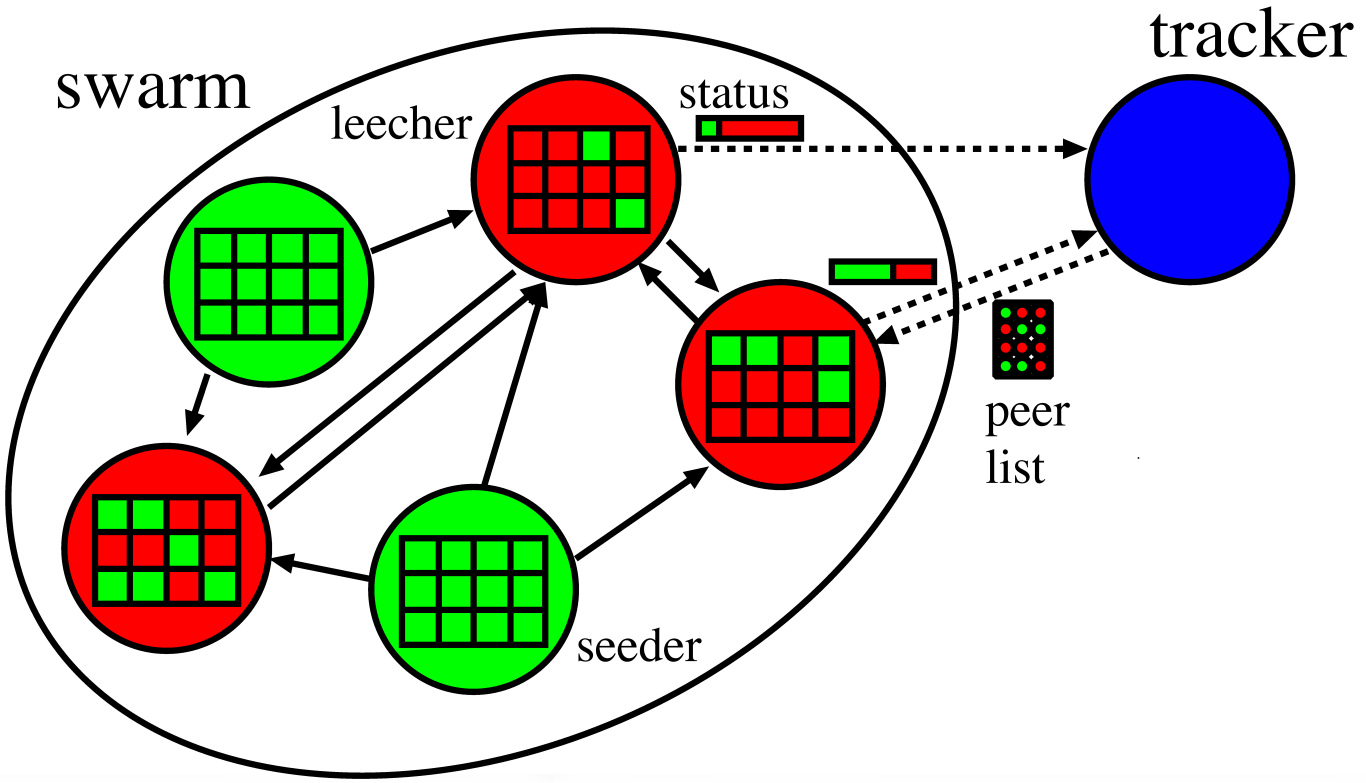
- In the *BitTorrent protocol*:
  - TFT-like method used for sharing files
  - nodes form groups interested in a particular file (swarms) and swap or “barter” pieces with each other
  - if a node does not upload data then this can be compared to playing defection
  - it is punished in the future by being “choked” - not getting upload from others
  - even if you hack your client to be selfish the chances are the standard TFT-like protocol will do better overall
  - *Bram Cohen* - original BT designer - inspired by Axelrod’s tournaments

Some BitTorrent Terminology

- Swarm: set of peers interested in a file
  - file is split in smaller chunks called pieces
  - seeder: holds a full copy of the data
  - leecher: holds only a part of the data (initially nothing)
- Tracker: centralized manager
  - keep track of all peers in the swarm
  - return list of current peers in swarm
- Torrent file: meta-data
  - contains pointer to tracker hosting the swarm
  - details about the file - hash, no. of pieces, size etc.

BitTorrent Protocol

- Get a list of other peers in the swarm from the tracker
- Ask peers their list of pieces and tell them what is yours
- Exchange pieces with appropriate peers



The Global Ecology of BitTorrent Clients

- Many *bittorrent clients* exist in "the wild"
  - Bittorrent 6 (from Bittorrent.com, formally utorrent)
  - Others: Azureus, ABC, Transmission, many others…
  - bad guy clients: BitThief, BitTyrant
- Hence:
  - The current bittorrent ecosystem is a ***global on-going experiment***, like Axelrod's, but with huge user base and rich interactions (not just TFT) incredible strategy sophistication
  - This is unprecedented and will surely lead to new economic theory - in general!

BitTorrent Clients

BitTorrent client	FOSS	Linux/Unix	Windows	Mac OS X	IPv6[1]	Programming language	Based on	Interface	Spyware/Adware/Malware-free
ABC	Yes	Partial	Yes	No	buggy[2]	Python	BitTornado	GUI and web	Yes
Acquisition	No	No	No	Yes	?	Objective-C and Cocoa	Limewire	GUI	Yes
Anatomic P2P	Yes	Yes	Yes	Yes	No	Python	BitTornado	GUI and old CLI	Yes
Arctic Torrent	Yes	No	Yes	No	No	C++	libtorrent	GUI	Yes
aria2	Yes	Yes	Yes	Yes	?	C++	-	CLI	Yes
Azureus	Yes	Yes	Yes	Yes	Partial[3]	Java and SWT	-	GUI, CLI, Telnet, Web, XML over HTTP remote control API	Yes
BitComet	No	No	Yes	No	No	C++	?	GUI	Yes [4]
BitFlu	Yes	Yes	No	Yes	Yes	Perl	-	Telnet and Web	Yes
BitLet	Planned	Yes	Yes	Yes	?	Java and JavaScript	-	Web XHTML	Yes
BitLord	No	No	Yes	No	No	C++	BitComet	GUI	Adware
BitPump	No	No	Yes	No	No	C++	-	GUI	Yes
Bits on Wheels	No	No	No	Yes	No	Objective-C and Cocoa	-	GUI	Yes
BitSpirit	No	No	Yes	No	No	C++	BitComet	GUI	Yes
BitThief	No	Yes	Yes	Yes	?	Java	?	GUI	Yes
BitTornado	Yes	Yes	Yes	Yes	Yes	Python	BitTorrent	GUI and CLI	Yes
BitTorrent 5 / Mainline	Yes	Yes	Yes	Old version	No	Python	-	GUI and CLI	Yes
BitTorrent 6	No	No	Yes	No	Yes	C++	µTorrent	GUI and CLI	Yes
BitTyrant	Yes	Yes	Yes	Yes	Partial [3]	Java and SWT	Azureus	GUI, CLI, Telnet, Web, XML over HTTP remote control API	Yes
Blizzard Downloader	No	No	Yes	Yes	?	?	BitTorrent client for early version	GUI	Yes
Blog Torrent	Yes	No	Yes	Yes	?	?	BitTorrent client for early version	GUI	Malware-Status: unknown
BTG	Yes	Yes	Partial[5]	Yes	No	C++	libtorrent	CLI, GUI and web	Yes

Take home message

- Previous work in social / economic science (Axelrod's IPD) has provided a basis for protocol design in a P2P system
- Deployed variants of the protocol are creating a massive global economic experiment
- Measurements can be made and these could inform new theory and new protocols

References

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From swarms to collectives

Where we start to see things that look a bit like "real economics" emerge

Communities have formed around BitTorrent Trackers

Quite a few of these:

Linux tracker

Public Trackers (e.g. PirateBay)

- BitTorrent uses Trackers to index swarms
- Public trackers let anyone join or create a swarm
- Sharing within a swarm is incentivised via a form of tit-for-tat (as we have seen)
- However there is no incentive for:
  - Seeding (uploading after file is downloaded)
  - Capping (creating and injecting a new file)
  - Maintaining a Tracker in the first instance

Private Trackers (Many)

- Private Trackers have emerged more recently
- Only allow registered users to join swarms
- May track upload / download of each user
- Some keep centralised accounts for each user
  - When users download much more than upload they may be kicked out
  - Many different schemes: ratio, credits, points etc
- Some rely on users to just be nice with various “gentleman's club” methods

A little detail on credit systems

- We will give a little detail on credit systems in private BT communities
- Give a flavour of how economic / collective issues are becoming significant
- Present results from a simple (agent-based) model and some measurements of a real private tracker

Private Trackers - Credit

- Consider a scheme based on credits
  - Uploading 1MB earns one credit
  - Downloading 1MB costs one credit
  - A user with no credits can't download
- Users must be given some initial credit
- In fixed size pop. total credit remains constant
- Similar to a fixed supply of money in an economy (loose analogy!)

Private Trackers - Credit

- How much credit should be put into the system?
- How would it effect the efficiency of the system?
- When do credit squeezes occur?
- How can they be avoided?

We define a credit squeeze as a situation in which, due to lack of credit, the efficiency of the system is significantly reduced.

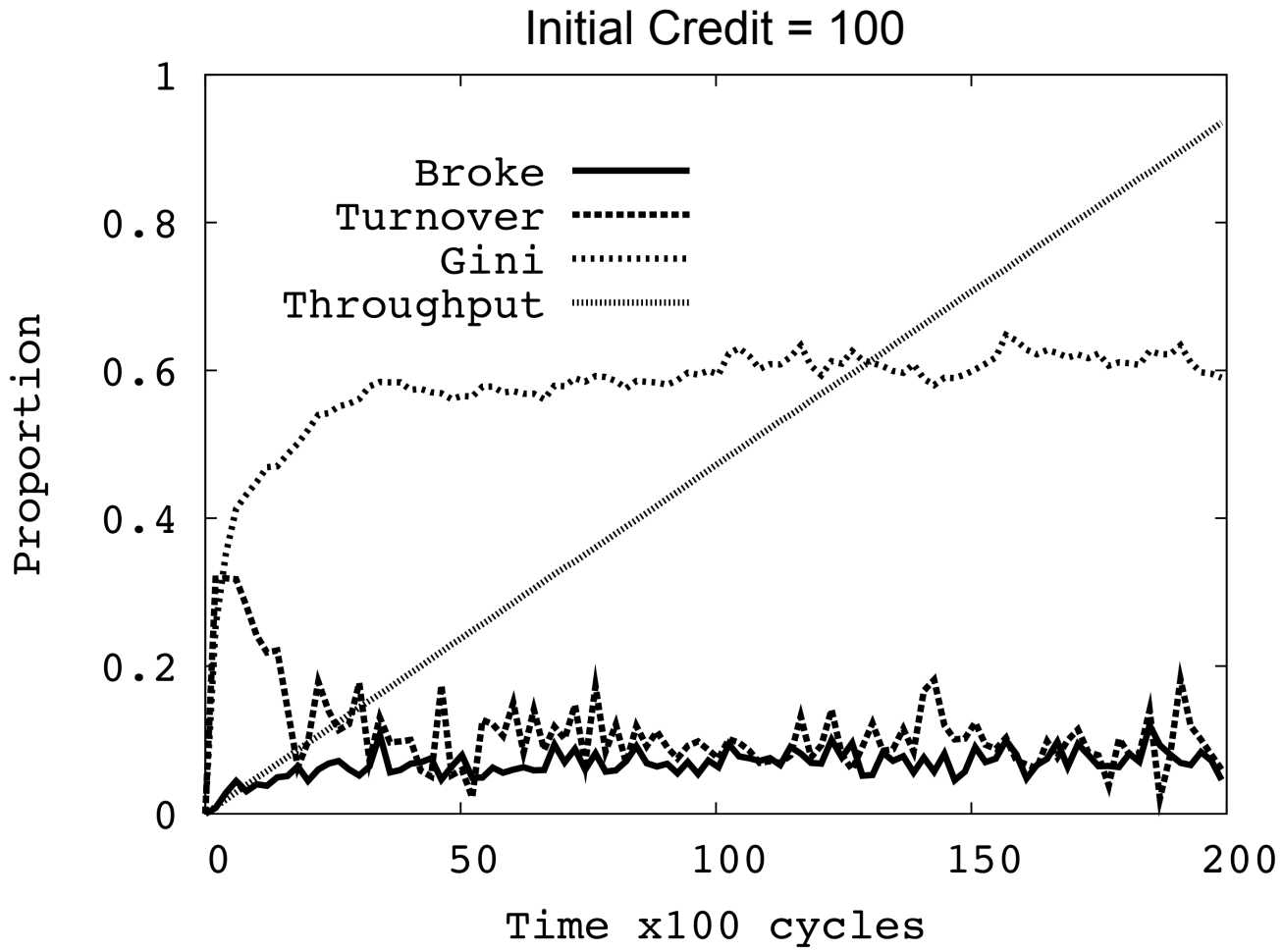
BitCrunch Model

- Highly abstract and simplified model
  - All nodes have equal upload / download
  - Equally interested in all swarms on the tracker
  - Always uploading to one swarm (seeding)
  - Always downloading from another swarm (leeching)
  - No modelling of tit-for-tat or free-riding
  - Always online, fixed population
  - If run out of credit (broke) must wait until earns some via upload before being allowed to download
  - Swarms assumed to share upload “perfectly”

BitCrunch Model – baseline runs

- Parameters:
  - 500 peers, 100 swarms
  - Peer upload and download capacity = 1 unit
  - Each file shared in each swarm = 10 units size
  - One simulation cycle = each swarm processes one unit of time
  - Run for 20,000 cycles (x10 runs)
  - For initial credit per peer of 1, 10 and 100 units

Typical basline simulation run



Baseline simulation results

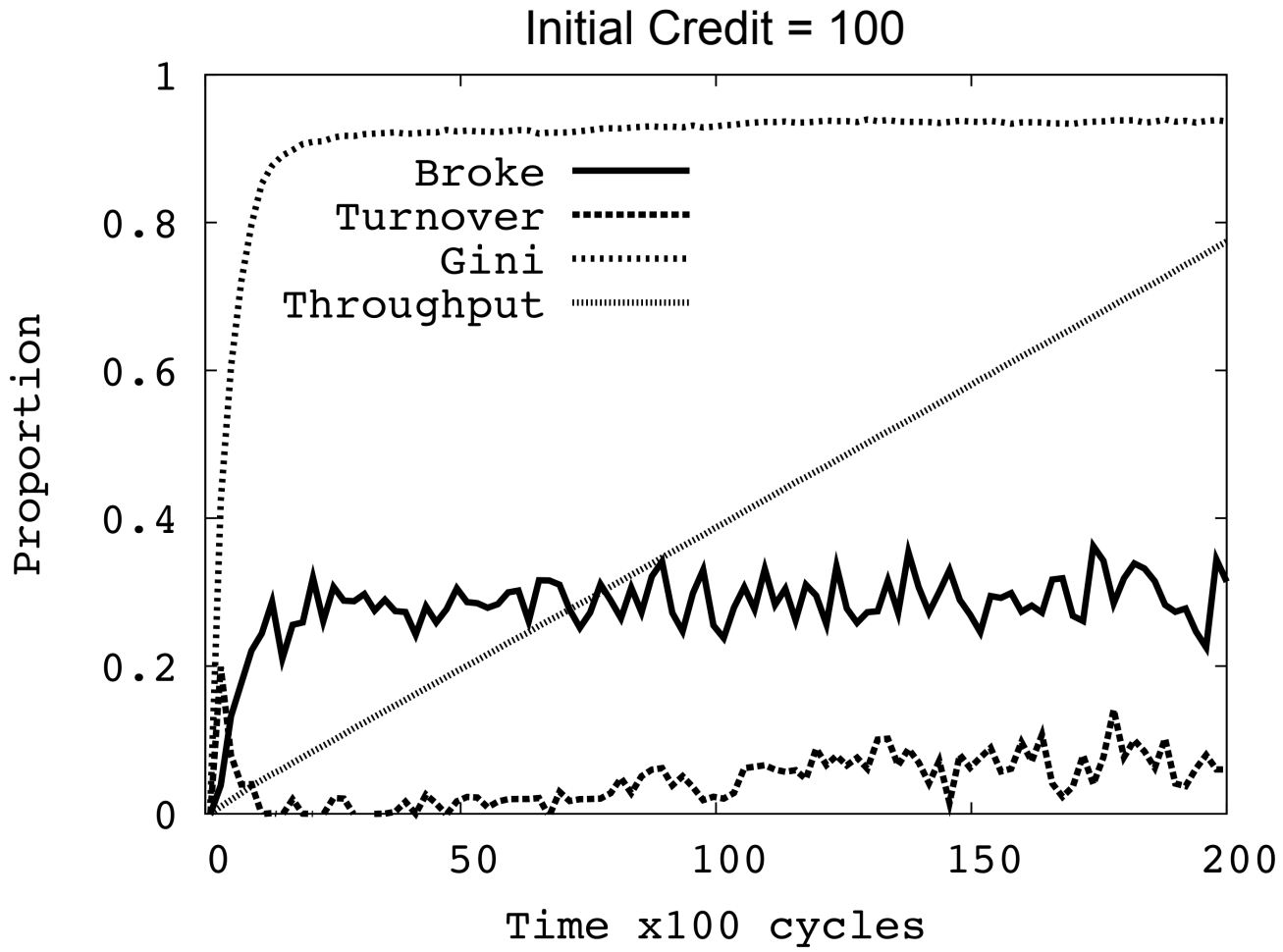
C	T	β	G	φ
1	0.58	0.36	0.87	0.84
10	0.81	0.20	0.77	0.43
100	0.97	0.06	0.59	0.10

C = initial credit
T = total throughput = total number of units uploaded as proportion of maximum possible (infinite credit)
B = proportion of nodes that are “broke” (zero credit)
G = Gini measure (simple measure of inequality of credit)
Phi = turnover of top 10% of peers ranked by credit (credit mobility)

Unequal capacities runs

- To determine what happens when some nodes of different upload capacities
- Parameters (same as baseline runs but):
  - All peers download capacity = 10 units
  - 10% of peers upload capacity = 10 units
  - 90% of peers upload capacity = 1 unit
  - Examined a (1.5 credit) seeding bonus approach to dynamically introduce more credit into the system

Typical unequal capacities run



Unequal capacities simulation results

C	T	β	G	φ
1	0.56	0.39	0.90	0.82
10	0.71	0.32	0.93	0.44
100	0.77	0.29	0.94	**0.06**
100++	0.97	0.01	0.71	0.00

C = initial credit
T = total throughput = total number of units uploaded as proportion of maximum possible (infinite credit)
B = proportion of nodes that are “broke” (zero credit)
G = Gini measure (simple measure of inequality of credit)
Phi = turnover of top 10% of peers ranked by credit (credit mobility)
100++ indicates initial credit of 100 with 1.5 credit seeding bonus

Observations

Even in a trivial model where all peers have the same capacities and user behaviour, all swarms have equal popularity and all peers start with equal credits, the performance of the system may be inhibited by credit shortages

Observations

Adding extra capacity to the system, in the form of upload and download, can actually reduce the performance. This is highly counter intuitive and something that should be avoided because it implies lack of scalability.

Observations

By injecting new credit into the system in the form of a ``seeding bonus'' a credit squeeze can be ameliorated when peer capacities are unbalanced.

Statistics from a Private Tracker

Day	T	Δ	Δ_0	δ	S/L
1	48	24	17	0.23	26
2	40	20	15	0.25	26
3	50	25	12	0.16	25
4	67	33.5	17	0.17	25
5	52	26	19	0.24	25
6	46	23	15	0.21	25
7	87	43.5	17	0.13	25
Ave.	56	28	16	0.19	25

Approx. 50,000 peers per day, 10,000 swarms,
access to credit balances of top 10%

T = throughput in TB over all swarms
Delta = total credit increase that day in the entire system
Delta0 = total credit increase for top 10% of peers
Delta = minimum fraction of credit increase that goes to top 10% of peers
S/L = seeder to leecher ratio over all swarms

Statistics from a Private Tracker

- Indicates “rich getting richer” since top 10% are getting a lot of the new credit
- High Seeder / Leecher ratio suggestive that a credit squeeze is happening for many
- But need more information to verify this
- Would be interesting to see what happened to throughput if there was a “free day” or seeding bonus was increased

Conclusions

- Private trackers using “ratio enforcement” policies appear to be ad-hoc and various
- But can have dramatic effects on efficiency
- Too much credit could encourage free-riding
- Too little creates squeezes = lower efficiency
- These are just initial investigations
- Much more work needs to be done!

Take home message

- Communities formed around trackers provide an on-going global socio-economic experiment
- Self-organisation of socio-economic structures in measurable forms
- Ideas, models and theories from socio-economics may inform and learn from this
- Such communities so strong don't be surprised if they start influencing the "real world" (e.g. the PirateParty)

References

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What are we trying to do?

Where we ask "what is a socially intelligent ICT system?"

COSI-ICT (ASSYST)

- Complex Systems Science for Socially Intelligent ICT
- Cluster of four IPS:
- Qlectives, Epiwork, Socionical, Cybermotions
- ASSYST is an associated CA - action for the science of complex systems and socially intelligent ICT
- http://www.assystcomplexity.eu/

Basic Questions from Jeff Johnson

1. What is ICT-enabled social intelligence?
2. What theories exists on social intelligence?
3. Are there engineering principles for creating social intelligence systems?

1. What is ICT enabled social intelligence?

First let’s ask:

What is Social Intelligence?

What is social intelligence?

Answer

It is the opposite of:

Antisocial stupidity

What is social intelligence?

- What is meant by intelligence?
  - doing the right thing to achieve goals given the information at hand (reason)
  - learning from experience in order to improve performance (adaptation / learning)
- What is meant by social?
  - some population of intelligent entities (agents)
  - agents cooperate to achieve their goals
  - goals of agents may or may not conflict
  - interactions restricted by spatial, temporal and informational constraints - may be dynamic

What is social intelligence

- Feedback mechanisms:
  - individual (micro) to collective (macro)
  - collective (macro) to individual (micro)
- Leading to, emergent, “collectively good” outcomes
  - Adam Smith called it the “hidden hand” in the context of markets
  - Many mechanisms other than markets

1. What is *ICT enabled* social intelligence?

- Social intelligence in which:
  - ICT plays a significant role in social mediation
  - The agents are users and possibly computational agents and services
  - enables the emergence of "collectively good" outcomes through e.g.:
    - Fostering cooperation (incentives)
    - Conflict resolution (norms, rules, policing)
    - "Fair" and "productive" allocation of resources
    - Filtering out "bad" adaptations and spreading "good" adaptations

2. What theories exists on social intelligence?

- **Evolutionary theory**: reciprocal altruism, kin, group and cultural group selection
  - How +ve social behaviors / strategies / norms emerge through evolutionary processes
- **Common pool resource theory**: Ostrom's CPRG
  - How people govern common resources collectively and productively
- **Social contract theory**: Rawls' "Theory of Justice"
  - Using reason to derive just social norms / laws that others subscribe to rationally
- **Economics, markets, peer production, symbolic interactionism, enthnomethodology…**

3. Engineering principles for creating social intelligence systems?

- Active research area we focus on in QLectives
- Socially inspired design patterns for P2P:
  - Direct reciprocity (e.g. TFT in BitTorrent)
  - Indirect reciprocity (e.g. credit / points systems)
  - Group selection (e.g. evolving communities)
  - Altruistic punishment (e.g. self-policing)
- See ***QLectives deliverable D2.1.1*** for details on www.qlectives.eu

Elinor Ostrom 1990

Ostrom identifies eight "design principles" of stable local common pool resource management:

1. Clearly defined boundaries (effective exclusion of external unentitled parties);
2. Rules regarding the appropriation and provision of common resources are adapted to local conditions;
3. Collective-choice arrangements allow most resource appropriators to participate in the decision-making process;
4. Effective monitoring by monitors who are part of or accountable to the appropriators;
5. There is a scale of graduated sanctions for resource appropriators who violate community rules;
6. Mechanisms of conflict resolution are cheap and of easy access;
7. The self-determination of the community is recognized by higher-level authorities;
8. In the case of larger common-pool resources: organization in the form of multiple layers of nested enterprises, with small local CPRs at the base level.

User Models

- We need realistic models of how users behave when embedded within given ICT systems
- A priori theoretical models tend not work – users rarely behave “rationally” in the sense of maximising some simple utility
- Empirical measurements suggest its complex – heterogeneous, adaptive, but progress can be made
- Need large-scale deployments / measurements – an empirical / experimental approach

Rawls' "veil of ignorance" approach

- assume we wish to specify the kind of society that is just and good
- but we stand outside the society and don't know what role we ourselves would play
  - we are ignorant of what endowments, knowledge, capacities and position we would hold
- what rules / norms would we accept as just and fair? i.e. what would we accept as "collective good"

Designing a socially int. system

- We wish to specify the requirements of a system that will structure interaction between peers
- the protocol could run on diverse devices with diverse goals, capacities and user behaviour
- but we need 1 billion users of the system to make it a success (and get rich)
- What collective goals will we define such that many different devices and users would accept and run it?
  - “do no evil”? or “make the world a better place”? or “from each according to his abilities to each according to his need”?

Replacing the banks….

Tragedy of the financial commons

- Some examples:
  - Individual bank creates excessive credit through lax loans that can be securitised and sold on (to another bank)
  - Asset bubbles transfer wealth from the majority to the minority
  - State debases the coin via printing money
- Two broad responses:
  - More central control – Hobbsian Leviathan
  - Less central control – Efficient markets

Some financial functions

- Value transfer
- Credit creation
- Value storage
- Exchange of services and products
- Quality money?

Alternative

- Possible emerging alternative:
  - Radically decentralise systems that support financial functions
  - Use emerging trends in distributed information systems
  - Alternative economic / cooperation theories

Emerging trends in info. systems

- Over recent years a number trends have emerged within information systems:
  - social networks (facebook, LinkedIn)
  - peer production (wikipedia, open source)
  - peer-to-peer systems (BitTorrent)
  - virtual currencies (second life, farmville, BitCoin)
  - cheap mobile devices connected to global networks

Alternative cooperation theories

- Bottom-up forms of altruism and trust
  - group selection, migration
- Reciprocity:
  - direct, indirect, network
- Others:
  - affinity, reputation, altruistic punishment

Some on-going projects

- P2P lending (lend/borrow directly)
- Members banks (become a bank)
- Money free economies (eliminate money)
- P2P money (create your own money)

Eliminating banks / interest

- Zopa – P2P lending system without a bank. Nonlocal, becoming successful
- JAK Bank – Members bank controlled by and for only the members. Eliminates interest. Highly local

Zopa – Loans from people not banks

http://uk.zopa.com/ZopaWeb/

Wikipedia (en)

abn abn-cred lloyds cap1 webank cov cahoot abbey xe mbna hfx R4 meebo google Xtr uknova gmail tvt tvguide

Wifipass : Welcome page

Zopa – Loans from people not ...

ZOPA ITALY ZOPA JAPAN ZOPA UK ZOPA USA

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Get a loan
borrow at Zopa

Lend money
getting a return

Listings
a new way for money

About Zopa
how it works

Community
meet some members

My Zopa
access your account

I want a nice low cost loan with no sneaky fees.

YES PLEASE

I want to earn a better return on my spare cash.

YES PLEASE

Already a Zopa member? SIGN IN

Zopa Home . Blog . Discussion board . Press . Contact us . Jobs . Help

Done

JAK Medlemsbank

http://www.jak.se/

Wikipedia (en)

abn abn-cred lloyds cap1 webank cov cahoot abbey xe mbna hfx R4 meebo google Xtr uknova gmail tvt tvguide QLectives

Wifipass : Welcome page | JAK Medlemsbank

Internetbanken | Sidkarta | Sök

Hem | Vad är JAK | Spara & låna | Lokal ekonomi | Lokalavdelningar | Folkbildning | Bli medlem | Ung i JAK | Kontakta JAK | International | Grus & Guld

Information in:

English

Esperanto

Italiano

Deutsch

Español

Français

Arabic

Networking

Do you want to share your contact details and to find other projects/people interested in interest-free economy in your country? Click here

More information:

International Newsletter

Questions and Answers about JAK

JAK Ambassadors

Other interest-free projects

Coming events

Past events

JAK International

This is the international webpage of JAK Medlemsbank (JAK Members Bank). Our main goals are:

1.Explain how the system of JAK Medlemsbank (JAK Members Bank) is working.

2.Link to other interest-free projects all around the world

3.Receiving information from you – the readers – about projects, events and dreams related with interest-free economy

Here you can find our International Newsletter

Here you can also find information about JAK Medlemsbank (JAK Members Bank) in different languages: English, Italian, German, Spanish, French, Arabic. and contact to people who can help you to understand JAK in different languages: our JAK Ambassadors.

We are not alone in our work to create interest-free economic alternatives! Here you can read about other projects who share this ambition!

Subscribe to JAK's International Newsletter here:

e-mail adress

Name and Country (optional)

Send

Networking

NYHETER

2010-01-27 Medlemsavgiften 2010
- Du har väl bestämt dig? Kvällsöppet ikväll- ring på 0500 - 46 45 00

2010-01-13 Stort intresse för räntefri workshop i Köpenhamn

2010-01-12 Schemat för JAK skolan i februari är spikat

2009-12-21 Ny sparfaktor och låneavgift

2009-12-15 JAK ska vara renlärigt

KURSER & SEMINARIER

2010-02-19 JAK Skolan på Axvall

2010-03-05 JAKskola för unga 5-7 mars 2010

BLOGG

2010-01-20 JAK Växer! Men vad

Done

Eliminating money

- CouchSurfing – people freely share spare accommodation all over the world. Global and active
- Freecomony – people freely share anything (generally localised)

CouchSurfing – Participate in Creating a Better World, One Couch At A Time

http://www.couchsurfing.org/

Wikipedia (en)

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Wifipass : Welcome page | CouchSurfing – Participate in C...

Sign Up | Login | Language: Language

CouchSurfing

Login | Surf / Host | Community | Messages | Share | About

Participate in Creating a Better World, One Couch At A Time

Sign Up

CouchSurfing is a worldwide network for making connections between travelers and the local communities they visit.

SEARCH FOR A COUCH NOW!

Find an available couch from the list below

Find Out More

Is This Safe?

Sign Up Now!

Users Online


Sweden


Israel


United States


China


China


China


Canada


India

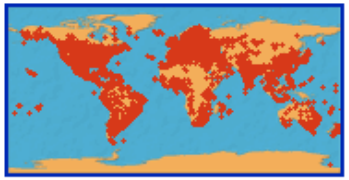

Germany


South Korea

Quick Links

- FAQ's
- Sign Up Now!
- About CouchSurfing
- What Members Say
- Interesting Statistics
- New CouchSurfers
- CouchSurfing Tips
- Latest News
- Surf Shop
- CS Collectives

CouchSurfing Statistics



CouchSurfers	1,648,916
Successful Surf or Host Experiences	1,757,588
Friendships Created	1,916,917
Positive Experiences	3,059,073
Countries Represented	234
Cities Represented	69,690

more statistics »

Testimonial

Sandra Benvie
Prince George
British Columbia

I've just had my first couchsurfer..and it has been a wonderful experience to be able to provide a fellow traveller with a bed for a couple of nites. I think this is the best thing the internet has to...
read more

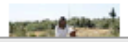
more testimonials »

Latest News

General News

January 27th, 2010 — Meet CouchSurfers for Exploration,

Some Random CouchSurfers

Done

thefreeconomycommunity

Join the world's fastest growing alternative economy ...

- ✓ Save money. Learn new skills. Reduce your carbon footprint. Meet new friends locally. Get help with projects for free.
- ✓ Share skills, tools, and spaces through **freeshare**.
- ✓ Share advice, information or ask freeconomic questions in our **forum**.

The Freeconomy Community's aim is to help reconnect people in their local communities through the simple act of sharing.

Find out more - **watch the video**, read about our **philosofree** and **how it works**.

Latest Blog Entry

Blog Feed

Sat
23 Jan

Money as Debt

how it works
freeconomy philosofree
freeshare
spread the word
inspirational stuff
faqs
forum

P2P money

- Using a social network of trusted friends
- Each person can apply a credit level to each link in any monetary unit
- Payments between nodes (value transfer) involves the system finding a route of credit between nodes
- Depends on trust and enough back-to-back transfers to balance over time
- Compare to *Hawala* system and other “informal value transfer” IVT, systems


Ripplepay.com
ripplepay.com
https://ripplepay.com/
Wikipedia (er
abn abn-cred lloyds cap1 webank cov cahoot abbey xe mbna hfx R4 meebo google Xtr uknova gmail tvt
Wifipass : Welcome page
Ripplepay.com
Ripple
Home
About
FAQ
Donate
Contact
Log in
Sign up
Ripplepay.com Home
Ripplepay.com is a payment system where you can be your own banker. Connect to your friends, family, and associates and your credit with them becomes a fully-functional currency. Read more.
1825 users
662 accounts
2054 payments
Contact Ryan with question, concerns, or feedback.
Ripple
Login
Username or Email Address
dave@davidhales.com
Password
Login
Forget your password?
Register
Click here to sign up as a new user.
Done

P2P Money

- Currently know of no widely used deployed system (but *BitCoin* gaining ground)
- Bootstrapping problem - possible way forward:
  - Create a p2p virtual currency in a virtual game world with existing social networks
  - Take detailed measurements and collect data
  - See if it works and produce models
  - If successful grow the currency outside the virtual game

BitCoin

- P2P fully distributed crypto-currency
- Distributed database of all transaction (transparency)
- Various anti-attack mechanisms
- No central control = should be hard to shutdown
- New coins issued in a controlled and distributed way
- Seems to be in a speculative bubble right now

Quality money

- Subjective rating = objective quality?
- In a given community:
  - if enough people believe a unit of exchange is high quality they will accept it for payment
  - then it is high quality
  - But, you can only fool *all* of the people *some* of time…

Let 1000 experiments bloom

- Given a sufficient ecology of financial commons systems (avoiding a financial monoculture)
- Individuals can “vote with their feet” migrating to those that are of high quality
- Hence even “rational” behaviour could drive quality rather than driving it out
- Tiebout (1956), Hayek (1978)

Bits and bats

- Some leftover slides that might be interesting

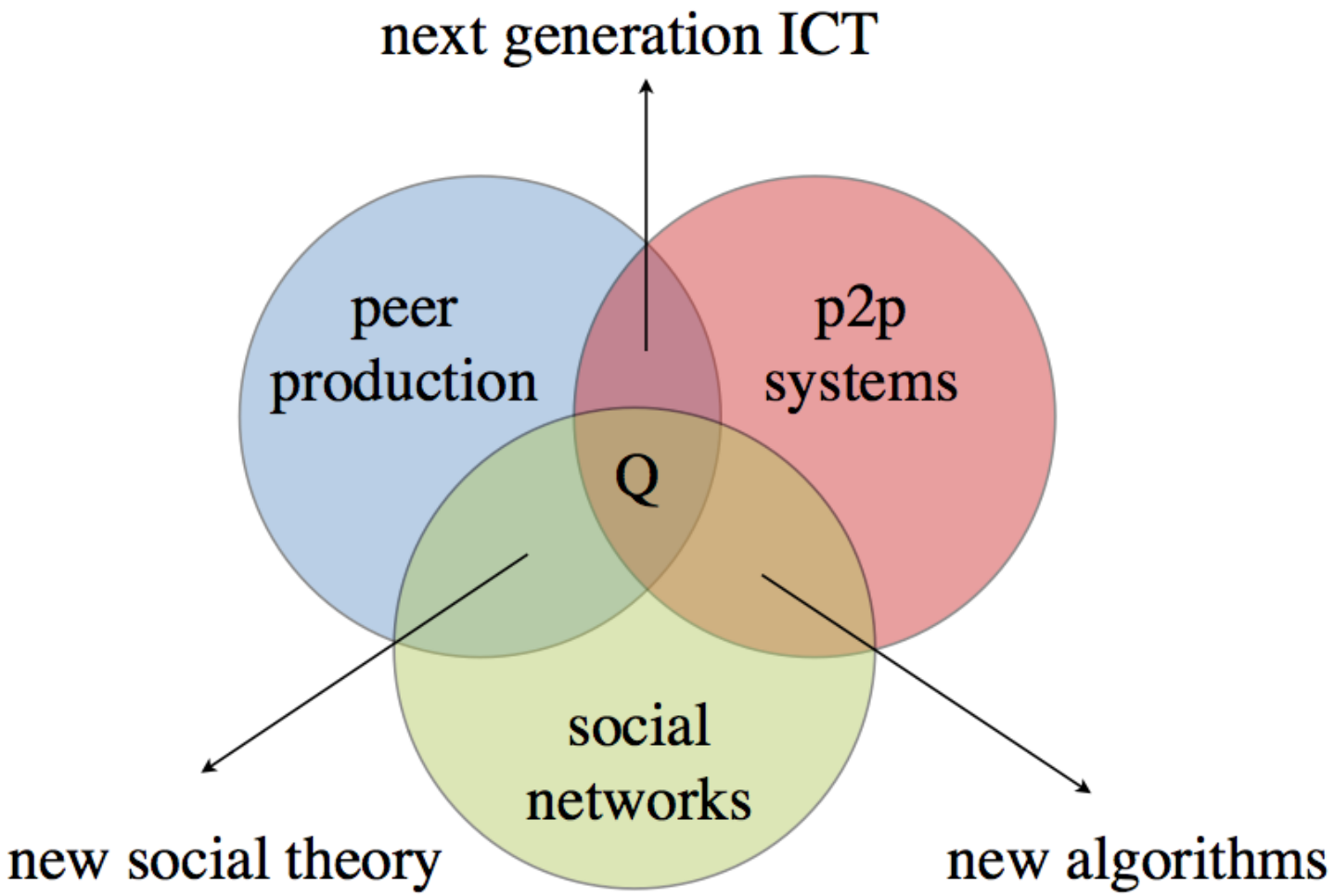
Trends

- Recent trends
  - Peer Production (wikipedia, open source)
  - Social Networks (facebook)
  - Peer-to-Peer (P2P) systems (bittorrent, skype)
- Related themes
  - Communities not individuals (social)
  - Sharing, giving, social production without traditional economic incentives
  - New kinds of “commons” new kinds of tools for managing those commons

Quality Collectives

"QLectives can be defined as cohesive and cooperative resource sharing communities directed towards the peer production of commonly defined high quality artifacts, services and experiences."

Lectives

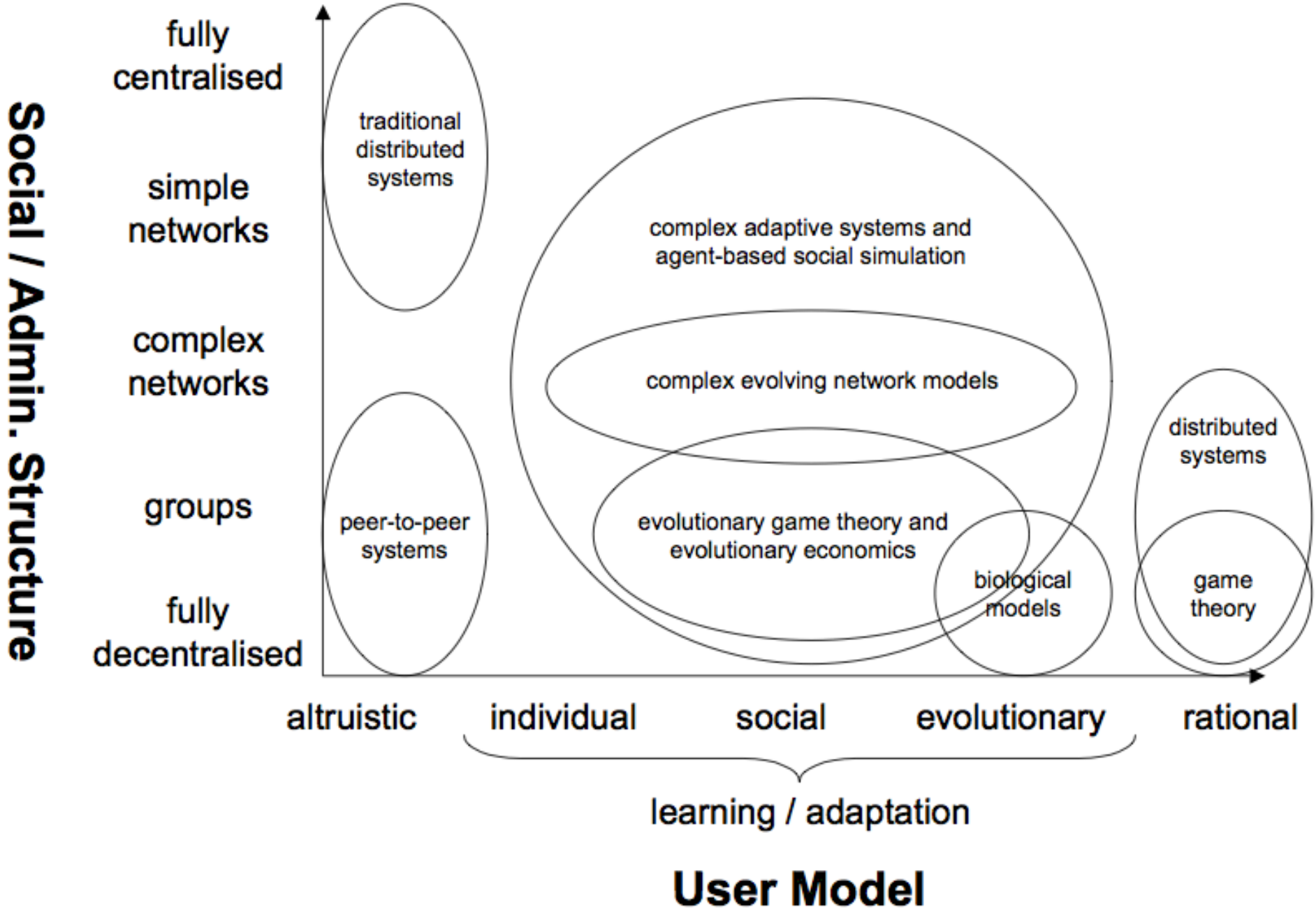

next generation ICT
peer production
p2p systems
Q
social networks
new social theory
new algorithms

Social approach

- Such systems are social from the start
- Social structures are dynamic not static – they have a history
- The dynamics of the structure are part of the "game" of interaction
- Group formation processes important
- Cultural evolution, cultural group selection
- Memetics

Questions

- How are dynamic social structures formed and maintained?
- How do users actually behave?
- User behaviour / structure feedback both micro -> macro and macro -> micro (and don't forget the meso)
- Individual rational models of user behaviour rarely directly applicable


Social / Admin. Structure
fully centralised
simple networks
complex networks
groups
fully decentralised
traditional distributed systems
peer-to-peer systems
complex adaptive systems and agent-based social simulation
complex evolving network models
evolutionary game theory and evolutionary economics
biological models
distributed systems
game theory
altruistic
individual
social
evolutionary
rational
learning / adaptation
User Model

Empirical Stuff

- Public and Private BitTorrent Community measurement studies - scraping and processing vast amounts of data
- *Meulpolder, M., D'Acounto, Capotă, M., Wojciechowski, M., Pouwelse, J.A., Epema, D.H.J., Sips, H. J. (2010) Public and private BitTorrent communities: A measurement study. International Workshop on Peer-to-Peer Systems (IPTPS) 2010, San Jose, California, USA*
- Ethnographic studies of private communities - joining communities, observing and talking to people
- Nazareno Andrade et al (forthcoming)

Significant works

- Recent empirically informed works suggest possible new ways to understand and build socio-technical systems:
  - **Elinor Ostrom**, *Governing the Commons: The Evolution of Institutions for Collective Action*, Cambridge University Press, 1990
  - **Manuel Castells**, *The Information Age: Economy, Society and Culture Vol. III.,* Blackwell, 2000
  - **Yochai Benkler**, *The Wealth of Networks: How Social Production Transforms Markets and Freedom*, Yale University Press, 2006

Design Space Analysis for Modelling Incentives in Distributed Systems

- Joint work with Rameez Rahman, Tamás Vinko et al. (Technical University of Delft)
- To be presented at SigComm 2011 in August.
- Apply an Axelrod-like tournament approach to evaluate P2P protocol variants

PRA characterisation of a protocol

- ***Performance*** - the overall performance of the system when all peers execute Π (where performance is determined by the application);
- ***Robustness*** - the ability of a majority of the population executing Π to outperform a minority executing a protocol other than Π;
- ***Aggressiveness*** - the ability of a minority of the population executing Π to outperform a majority executing a protocol other than Π.

Parameterising a P2P protocol

- **Peer Discovery**: In order to perform productive peer interactions, it is necessary to find other partners. For example, when a peer is new in the system, looking for better matching partners or existing partners are unresponsive. The timing and nature of the peer discovery policy are the important aspects of this dimension.
- **Stranger Policy**: When interacting with an unknown peer (stranger), past history cannot be used to inform actions. It is therefore necessary to apply a policy to deal with strangers. The way peers allocate resources to strangers is an important aspect of this dimension.
- **Selection Function**: When a peer requires interaction with others this function determines which of the known peers should be selected. This could include, for example, past behaviour (through direct experience or reputation system), service availability and liveness criteria.
- **Resource Allocation**: During peer interactions resources must be allocated to the selected peers (given by the selection function). The way a peer divides its resources among the selected peers, defines the resource allocation policy.

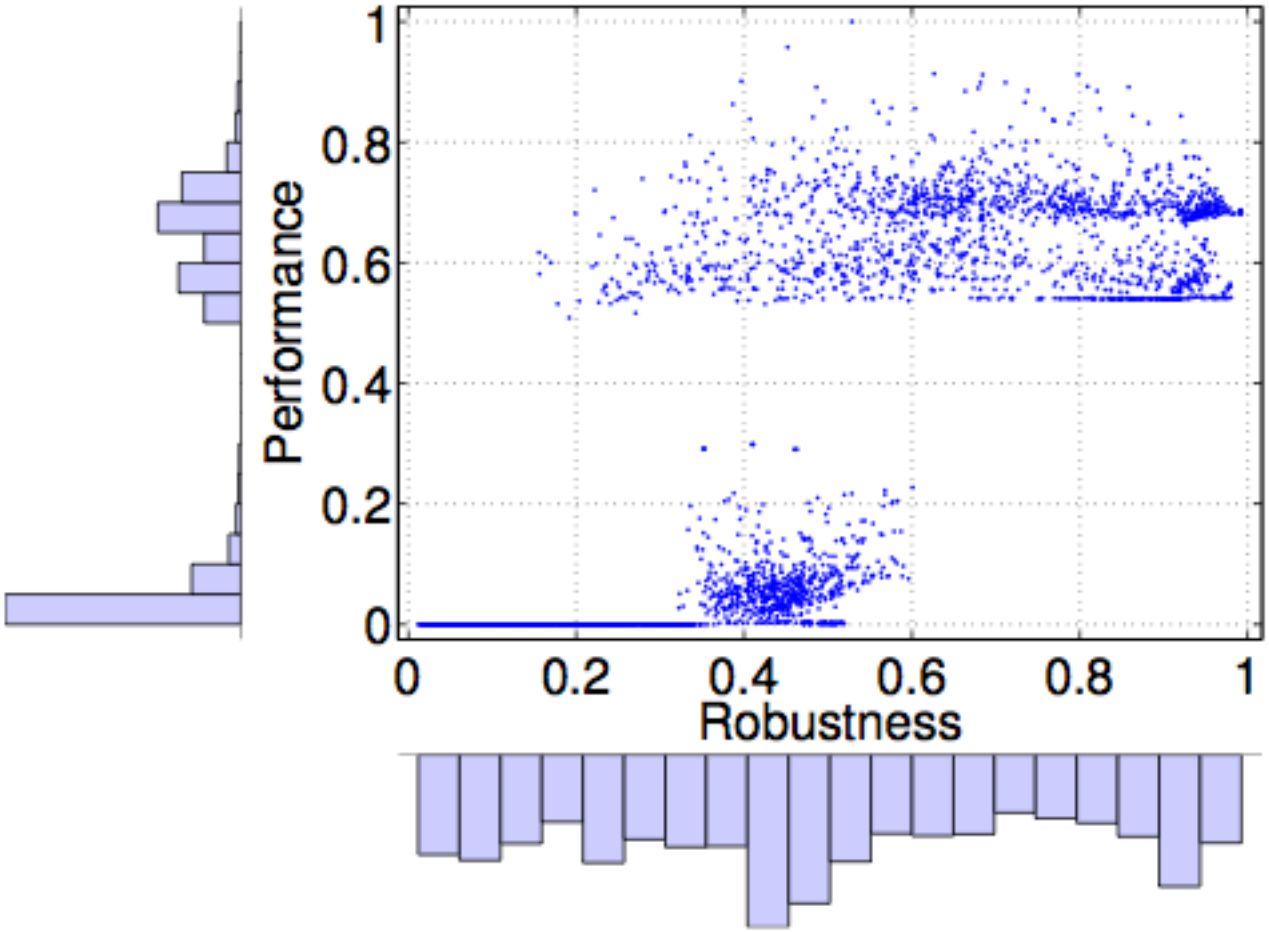


Figure 3: Scatter plot of all 3270 protocols in the design space with Robustness against Performance. The results presented here are a synthesis of over 107 million individual simulation runs. Histograms are also shown.

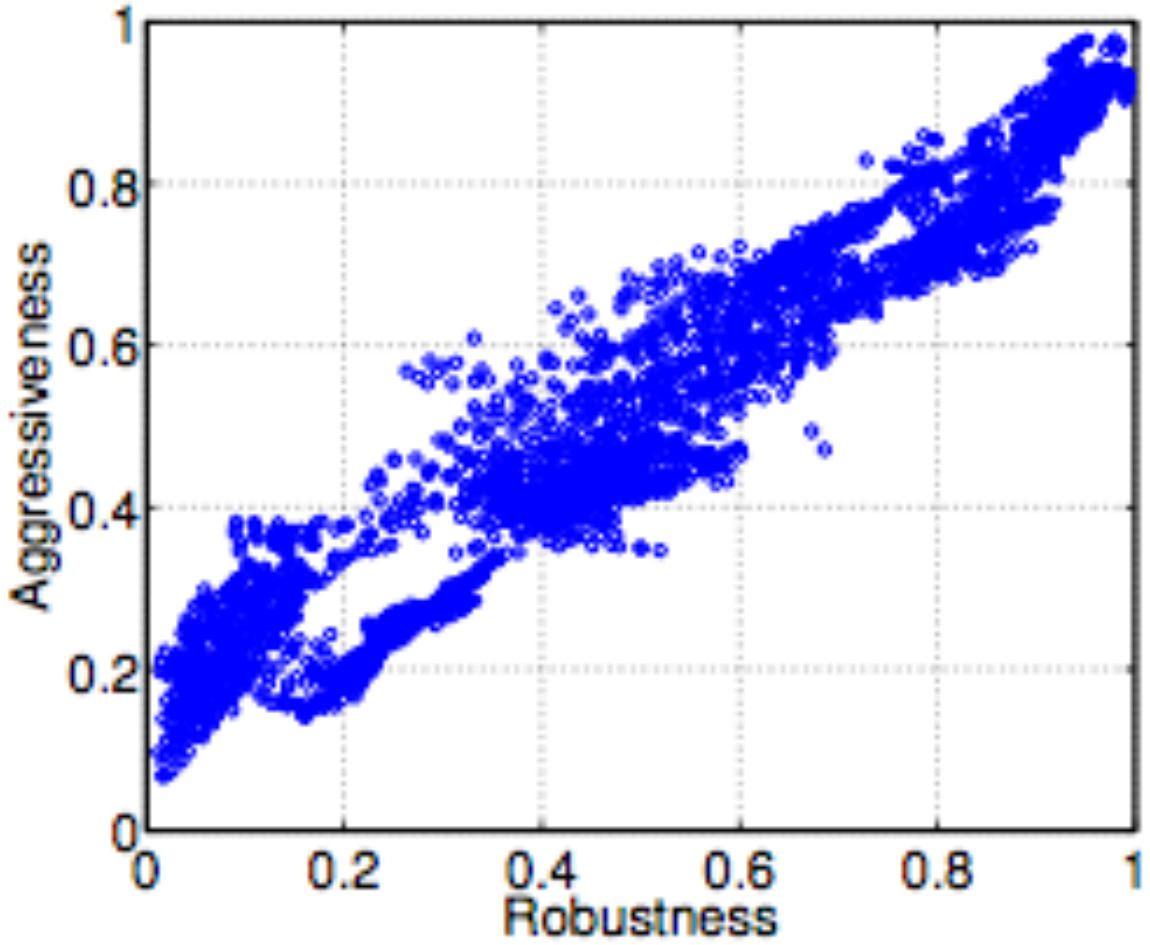


Figure 9: Scatter plot of robustness and aggressiveness values of the protocols. The Pearson's correlation coefficient is 0.96.

Some general findings for high performance protocols

- Small number of partners
- Stay loyal to them – favour those known for longest
- Share resources proportional to contributions
- Avoid interactions with strangers where possible
- ***Compare empirical work***: Kirman AP and Vriend NJ (2000) "Learning to be loyal: A study of the Marseille fish market" In: Gatti DD, Gallegati G and Kirman AP, Interaction and market structure: essays on heterogeneity in economics, Volume 484. Springer,