Activity Report 2015

Team DICE

Data on the internet at the Core of the Economy

Inria teams are typically groups of researchers working on the definition of a common project, and objectives, with the goal to arrive at the creation of a project-team. Such project-teams may include other partners (universities or research institutions).

RESEARCH CENTER
Grenoble - Rhône-Alpes

THEME
Security and Confidentiality

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Team DICE

Creation of the Team: 2013 February 01

Keywords:

Computer Science and Digital Science:

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3.2.2. - Knowledge extraction, cleaning
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Other Research Topics and Application Domains:

6.3. - Network functions
6.3.3. - Network services
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8.5.1. - Participative democracy
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9.5.3. - Economy, Finance
9.5.9. - Political sciences

1. Members

Research Scientist

Stephane Grumbach [Team leader, Inria, Senior Researcher, HdR]

Faculty Member

Stephane Frenot [INSA Lyon, Associate Professor, HdR]

Engineers

Auguste Caen [Inria, from Dec 2015]
Paul Mougel [Inria, until Aug 2015]
Damien Reimert [Inria, until June 2015]

PhD Students

Etienne Brodu [INSA Lyon, Atos, granted by CIFRE]
Robert Riemann [Inria]

Post-Doctoral Fellow
Aurelien Faravelon [Inria]

Administrative Assistant
Sylvie Boyer [Inria]

Others
Marwa Bekrar [Inria, Intern, from Feb 2015 until Jul 2015]
Billel Lasledj [Inria, Intern, from Feb 2015]

2. Overall Objectives

2.1. Overall Objectives

The DICE team has been created in February 2013 as an "action exploratoire" of Inria to initiate multidisciplinary research on the economy of data resulting from the digital revolution and its impact on all sectors of our society including its political organization.

With the growth of Web 2.0 systems, social data has become a fundamental resource of the economy, much like raw materials. A resource, which is as essential as crude oil, and on which our societies now fully rely. Data is harvested and transformed by industries that grow at an unprecedented pace. Digital corporations offer extremely valuable services, which attract hundreds of millions of users. These corporations generate ecosystems, which become as essential as public utilities and support millions of developers. The new utilities also challenge societies by making obsolete fundamental aspects of their organization, and by generating new imbalances at global scale. At the heart of these changes, is the new capacity to intermediate on two-sided markets, purely in the cloud, that is without having any presence in the physical world were the interactions are taking place.

The objective of DICE is to study the complex dependencies between technological, social and economic systems of the digital age, and to propose technical contributions as well as socio-political analyses. We aim to further investigate the impact of the digital revolution on political systems, anticipated by the French philosopher Michel Serres as expressed in Inria's 2020 Plan. *"if the vast volume of global data [···] were to become accessible to as many people as possible [···], such an event would be liable to put political institutions and the sciences that study them on a new path, perhaps more quickly than we expect."* Michel Serres also insists on the role of computer scientists in studying this revolution and its social impact.

Our contributions target both technical and theoretical aspects of the economy of intermediation platforms. Such platforms are digital intermediaries between users and services. They work on a global scale.

Our aim is threefold:

- We study from technological as well as social, economic, political, and geopolitical points of view, the new ecosystems emerging from the services offered by platforms based on mediating social data, which are reshaping the very form of our organizations;
- We propose technological solutions that answer some of the challenges faced by our societies, such as the concentration of data, the resulting asymmetry of information, and the subsidiarity of computation, that could contribute to better distribute the knowledge among stakeholders;
- We contribute to improve the knowledge of the information society and its implications among specialists as well as non specialists, in the public opinion as well as at the political level.

3. Research Program

3.1. Introduction

Our goal is to address technological issues as well as investigate their impact on society. We believe that addressing both directions simultaneously is essential. More precisely, we focus on the following two objectives:

- Technologies for global intermediation platforms, at reach for unbounded number of users;
- Trans-disciplinary investigations on the global impact of the new intermediation means.

We focus on intermediation platforms, for their increasingly fundamental role in our societies. Intermediation platforms are online systems which offer services to their users, which are well-tuned with their expectation, thanks to the knowledge the platform has accumulated on usage. Search engines and social networks are fundamental examples of intermediation platforms. More generally, intermediation platforms intermediate between producers of services and consumers of services in two-sided markets, with generally one side subsidizing the other. Intermediation will generalise beyond people to things, such as producers or consumers of energy for instance. The capacity to intermediate "in the cloud" with no presence in the physical world in which the market is deployed, by working purely on data with algorithms and in particular learning techniques, is at the heart of the revolution which reshapes our societies.

Platforms ensure a gatekeeping function, always in direct contact with their users, providing them with the most relevant information or contact. They also generate an ecosystem. To do so, platforms allow existing industries as well as new applications proposed by developers to build new services on top of their API. Their impact goes far beyond the Web, while they disrupt step by step all sectors of the economy, transportation, press, education, to name a few.

So far as computer science is concerned, we focus on the technologies used for intermediation, which are at the basis of the largest existing online systems. For the transdisciplinary questions, we focus mostly on the new equilibria that is resulting from the evolution of power balances due mostly to intermediation platforms.

3.2. Intermediation technologies

DICE focuses on intermediation platforms because of the central role they play in the emerging economy.

Intermediation platforms connect users to one another, or users to services with a very high accuracy. They rely on both technological and social innovations. These innovations were unthinkable only a decade ago, when platforms such as Facebook started. They allow communication and interaction between billions of users, gathered in the same digital space, both producers and consumers of data and services. State-of-the-art intermediation platforms include Facebook, Google, Twitter, GitHub, as well as Wikipedia, StackOverflow or Quora. These systems share a common design and their market penetration follows the same pattern. They are built around an initial minimal viable product based on a somehow naive low-tech implementation, which evolves after a few years of improvement to Web giants. Their domination now contributes to standardize the web industry, that means in particular:

- Gatekeeping, a direct relation with users together with services satisfying users' needs;
- Continuous data flows mapped to users' profiles;
- Search engines associating, in a relevant manner, producers, consumers and services.

These common characteristics lead to new software architectural standards, which are shared by all these systems, and used in the peripheral services developed in the ecosystem on top of their API:

- Authentication systems: openId, OAuth, ...
- Object graphs: opengraph, follower/followee scheme, ...
- DataFlow engines: Twitter storm, Google millwheel, ...
- Databases: noSql, keyValues stores, ...
- Application development: javascript, dart, MEAN (Mongo, Express, Angular, Node),...

These architectural components impact the whole digital world. DICE targets systems that use standard architecture services but preserve some aspects we consider as disruptive ones: *data concentration, data symmetry* and *computational subsidiarity*. Our current research activity includes the following directions:

- Peer-to-peer design for preserving users' primary data;
- Third parties based organic systems providing subsidiary data computation hosted at peer sites;
- In-Browser applications that impact mobile device and demonstrate instantaneous usability;
- Flow-based computing enabling a stream based exchange of information between peers at runtime.

3.3. Economy of intermediation

The recent neologism *uberization* coined after the name of *Uber*, a young intermediation platform, may summarize the effects of the digital revolution. This revolution is impacting all sectors of our societies such as organizations, education, energy, transportation and health, to name a few. This revolution results in a serie of what Schumpeter calls *creative destruction*. As traditional sectors disappear, new ones are created. Our societies, which did not anticipate the depth of the changes, have to struggle to adapt to the pace of the development of the industry. Legal reforms in various important sectors including taxation are at stake. Some countries, more reactive than others, are clearly leading the changes, exploiting the benefits for businesses and the capacity to generate information and value, while others are trying to catch up with the global trends.

Data form the bricks of the information society, and their flows between users and services constitute the blood of the industry. We focus in DICE on the strategic role of data in this revolution, and in particular on the systems that harvest the data and concentrate it. In particular, we focus on *intermediation platforms*. Doing so, we investigate the issues they raise and the disruptions they entail.

We are especially interested in the global political impact of intermediation platforms. The settlement of the *right to be forgotten* in Europe, for instance, examplifies the new roles platforms are playing: they are both targets of complaints from institutions and mandatory partners in the governance of the world in the digital era. Indeed, they deeply revolutionize the relations between governments and citizens. If privacy is the focus of considerable attention, together with the state surveillance, in Europe in particular, it is only one aspect of the new knowledge made available. Social media produce considerable knowledge not only on individuals, but on populations as well, their economic fate, their political orientation, etc. On the other hand, open data from governments allow citizens to monitor the action of their governments, as well as to contribute to it. The digital revolution, with the capacity to access information in ways unthinkable in the recent past, modifies completely the balance of powers between citizens, states and corporations.

We investigate the digital world, and more precisely the power relations, from an interdisciplinary perspective. We simultaneously quantify power relations by studying data flows and the rise of intermediation platforms and produce an economical, political and ethical analysis of this new state of affairs. Namely, we show that areas such as the US or China dominate the digital world when others, such as Europe, do not succeed in proposing widely used intermediation platforms. This situation generates several conflicts between countries and companies and prevents *weak* countries from promoting their values and policies.

A new trend is emerging in the humanities, around in particular the digital studies, which promote the cooperation between computer scientists and specialists of social sciences. Among them, the Berkman center for Internet and Society in Harvard, the Medialab at MIT, or the Web Science Institute in the UK have gained strong visibility. They address positive as well as negative externalities of IT for societies, that is the new potentials offered as well as their risks. The Center for Information Technology Research in the Interest of Society in Berkeley also addresses fundamental political impacts on democracy, which can be enhanced by open data as well as another philosophy of political power as currently implemented in the State of California for instance. The Open Data Institute in the UK is also a leading center for political issues in Europe. France should catch up on these research trends, at the intersection of different scientific fields.

4. Application Domains

4.1. Two-sided markets

Intermediation platforms operate in two-sided markets, that is in environments with two types of actors, producers of good or services on one side, and consumers on the other side. Intermediaries play a fundamental role by allowing the connection of both thypes of actors. If intermediaries already existed in the pre-digital era — banks constitute a historical example of intermediaries — it is really only the advent of digital technologies which boosts the development of intermediation. A large number of activity sectors fall in such a framework, including transportation, press, education, health, etc. We decided to focus on some of them in greater details for their particular relevance.

4.2. Education platforms

Education institutions are at stake because of the new technologies that not only change the access to knowledge, and therefore the traditional euilibrium between teachers and students, but also provide new means to produce knowledge, and share studying experiences.

Our objective is to develop a platform - called Jumplyn - that offers disruptive services for students, helps them produce their work, connects them to other students in the same area, and preserves their contribution online. The platforms targets students. It also aims at offering services on the other side of the education market, i.e. to institutions, by allowing them to organise the work of their students, as well as their evaluation. Jumplyn is accessible online and, as other platforms, evolves continuously.

4.3. Decentralised Voting

Online voting systems are controversial. They are advocated for their simplicity, which could contribute to enhance participation, but criticised for their failure to ensure the same properties as traditional voting systems. We propose an alternative path to online voting relying on decentralised systems with no concentration of data. A patent is under evaluation for the BitBallot protocol.

4.4. City administration

The team is actively participating to the Inria International Project Lab IPL CityLab on smart cities. We work also with the metropole of Lyon, and its Chief Data Officer in particular, to better understand the equilibrium between online plateforms and the public administration, and the policy regarding data and its accessibility to other parties.

4.5. Metrics for Digital Economy

While economic metrics based on trade of goods and services, as well as financial exchanges are well-established, exchanges of data, and more generally transborder activities on platforms are not included in standard economic measurements. Defining such metrics both theoretically and practically with means to evaluate them is of great relevance in economy, and beyond.

5. New Software and Platforms

5.1. BitBallot

The BitBallot voting protocol is designed to avoid the concentration of data by third party. The protocol allows users to cast their ballot on their mobile device, and then share only restricted amounts of their data with other peers to compute the tally. Unlike other protocols, voters pull data from others instead of pushing their own votes.

Convinced by the need of new election mechanisms, to support emerging forms of more continuous democracy, we are developing BitBallot, to allow elections with distributed tallying that incorporate individual verification. As such, it provides anonymity of the data sources, non interruptible run-time, global access to results, and non-predictability of results through partial communication spying. Cryptography is not essential to protect the privacy of the voters or the secrecy of the ballots. On the basis of this protocol, a SaaS platform that allows to run public tests online is under development.

- Contact: Stéphane Grumbach, Stéphane Frénot, Damien Reimert, Robert Riemann

5.2. C3PO

Social networks put together individuals with common interests and/or existing real-life relationships so that they can produce and share information. There is a strong interest of individuals towards these networks. They rely in general on a stable, centralized network infrastructure, and a user will always be provided with the same services no matter what their current context is. By contrast, the C3PO project (C3PO stands for Collaborative Creation of Contents and Publishing using Opportunistic networks) aims at promoting "spontaneous and ephemeral social networks" (SESN), built on top of a peer-to-peer distributed architecture leveraging ad-hoc mobile networks and the resources and services offered by mobile devices. As with traditional social networks, SESN can put together nomad individuals based on their affinities and common interests so that they can collaboratively work on tasks as part of a SESN. (Supported by an ANR project.)

- Contact: Stéphane Frénot, Damien Reimert

5.3. Fluxion

This joint project with Worldline aims at managing mobile code in complex Web architectures. We design a fast and reactive framework, transparently moving functions between running systems to cope with the load variation in high performance Web architectures. The Fluxion model is our approach to design mobile application modules that are a mix of functional programming and flow based reactive systems. We work on compilation techniques to transform a Javascript event-loop into a parallelized pipeline where each stage is made independent from the main event-loop.

- Contact: Stéphane Frénot, Etienne Brodu

5.4. Jumplyn

Jumplyn is a student project delivery platform. It offers a service based on three features: the ongoing management of the project, resources recommendation, and enhancement of the activity. Like any intermediation platform, it speaks directly to its users, students, and puts them in relation to relevant information.

- Contact: Stéphane Frénot, Stéphane Grumbach, Auguste Caen
- URL: http://www.jumplyn.com

6. New Results

6.1. The economy of intermediation and the anthropocene

Better understanding the economy, in a broad sense, of intermediation as it is performed by online platforms, is one of the major goals of the team. The paper [12] published in 1024, introduces the topics of algorihtmic intermediation and its social impact to a large audience.

Two contemporary revolutions are shaking the world. On one side, the digital revolution, which seems to introduce to a new economic era, allowing more sharing, and according to some authors the end of capitalism. On the other hand, the challenges of the preservation of our planet, and the limitation of resources that we are now facing. Clearly, there is an expectation that digital means will help face the challenges of the planet. In [14], we go one step further and analyse the possible relationship between the two phenomena, by drawing comparisons with biology where stress on ressources can lead to a horizontalisation of the species, much like what happens with digital technologies and intermediation platforms.

This later work is made in the framework of the study of the anthropocene, for which we are involved in the organisation of a workshop in the framework program of the HKW in Berlin on the technosphere

- URL: http://www.hkw.de/en/programm/projekte/2015/curriculum_campus_technosphere/campus_the_technosphere_issue.php

6.2. Geopolitics of intermediation platforms

Our study of the geopolitics of intermediation aims at grasping the balance of power between platforms, as well as between states - in their relation to platforms - and between platforms and states. We have designed coarse metrics [1] which capture the importance of a platform and the importance of a country in the digital landscape.

Our study focuses on the top 25 websites in a hundred countries. We emphasize the weight of intermedations platforms on the web. We also underline the imbalance between two digital powers - the United States and China - and the rest of the world. Indeed, most platforms belong to these two countries. We have extented our study to a deep analysis of the Asian case [8]. We develop our analysis in an interdisciplinary context as we collaborate with cartographers and economists. Two outcomes of our work are especially notable:

- We produce a set of maps and data vizualisations to illustrate the intermediation economy [11].
- We highlight the determinants of the imbalance in the intermediation landscape. National policies and incentives are of primer importance. The digita landscapes of Korea and Taiwan for instance, show that countries can still play a main role in their domestic web [8].

6.3. Public administration and intermediation platforms

Building on the sucess of platforms such as Uber and the analyses of their externalities, we study the potential role of platforms in public administration. Indeed, cities such as Boston exhibit the interest of a collaboration between administrations and platforms in city planning and maintenance. We also address the role of platforms at a wider level as we study cases such as the settlement of the right to be forgotten in Europe. Our work benefits from the collaboration with administrations, such as Lyon metropole and social scientists. In particular, we have designed three possible scenarii of collobation between platforms and institutions:

- Coexistence: platforms and institutions ignore themselves;
- Conflict: the services developped by platforms conflict with existing policies and institutional practices;
- Partenership: platforms and institutions partner around the development and promotion of services.

A working group has been established on digital sovereignty with CLTC, Center for Long Term Cybersecurity at UC Berkeley, Chaire Castex at Ecole Militaire, and Dice. This working group aims at getting a better understanding of the concept as well as the discrepancy of perception on both sides of the Atlantic. A first seminar was organised in Les Houches in december 2015.

This is work in progress with both academic and public administration actors.

6.4. Architecture design for intermediation platforms

Dice team designs software architectures for intermediation platforms. C3PO and BitBallot targets spontaneous and ephemeral social networks whereas Jumplyn focuses on pure central based system. All these architectures share a common JavaScript layout both at the client and the server sides. In the research context we validate state-of-the art technologies promoted by web leaders such as Google AngularJS, Facebook ReactJS and many others such as Netflix, Wallmart, or the Linux foundation for node.js. The Web environment raises many big issues since all equipments are basically connected to the Internet and the balance between end-user equipment cost and processing power is still a work in progress. Our main research track in such context is to find proper software toolkits hiding Web complexity. We mainly focus on time jitter, cornerstone of Web development, since it implies both end-user and network TCP indecisions. Due to this jitter combination the

Web programming model has mutated toward the promises paradigm. It is a complex event based development model provided without external API help. It handles future execution whether successful or not, in a time jittered context. AngularJS, ReactJS, CoffeeScript, NodeJS, MongoDB, ElasticSearch are all time jitter compliant technologies designed for the Web constrains and revolutionising the way we build intermediation platforms.

C3PO explores network transport laziness with the use of a DTN that imposes a larger jitter than classical TCP/UDP. We build a JavaScript mockup [5] that uses a Java based DTN that stores, carries and forwards message from source to destination. C3PO is a software framework extending AngularJS through plugins, without central server, even during deployment phases. We use the dynamic nature of JavaScript to build application on the fly from network messages containing the application description. Our C3PO architecture enables us to build ephemeral and spontaneous social network, on demand and in a matter of days.

Our joint work with Worldline explores the promises paradigm model to enable automation extraction of independent micro-service. These micro-services called *fluxion* [9], from the contraction of flow and functions, may be dynamically and transparently moved over a cluster of servers. Our novelty resides in the fact that the original code is not redesigned for the cluster architecture. *Fluxion* are extracted from the initial code, and an equivalence is maintained between the initially *promissified* code and the *fluxionized* one. Code has two facets, a promise one, used to express software services and a *fluxion* one, used to express software bottlenecks.

Eventually our work with Jumplyn explores complex centralised social network. We want to design a software system to later support our technical research hot topics. The target theme is a software platform that helps students handle their projects. University depends more and more on external resources to teach students. Theses resources are both known by students and their teachers, and the pace and range of explored technologies leads to difficulties in teaching state-of-the-art subjects. The more dedicated a professor needs to be in his research activity, the more broad knowledge he has to teach. For instance 20 years ago one could cope software development teaching with one or two programming languages. Nowadays, a single code involves more then four programming languages to be fully understood. This technology spreading issue stands still in many teaching domains, since past technologies are still actives and future one are promising. We build Jumplyn to cope with this unbalanced game. To help student improving their project and avoid working with obsolete technologies, and to help teacher face the universal and inexpensive availability of knowledge. Jumplyn is a complex JavaScript development stack that collects resources for improving student work and providing services to help them from day to day activities. The current stack integrates the following technologies : MaterialDesign, AngularJS, CoffeeScript, NodeJs, MongoDb, ElasticSearch. Managing and developing software service above this stack is a complex research issue for a small sized development team. We do not have any publication on Jumplyn since our first goal is to build a support intermediation platform to study classical issues such as recommendation or web crawling, scraping and indexation with our own sources of raw data.

7. Bilateral Contracts and Grants with Industry

7.1. Bilateral Grants with Industry

Worldline Wordline is a leader in B2B applications development, and is in the front line to provide new technical solution in the Web 2.0 era. We have a CIFRE partnership contract on the study of flow based architectures both at the data centers and at the Web browser level.

8. Partnerships and Cooperations

8.1. Regional Initiatives

8.1.1. IXXI, Institute for Complex Systems

The Dice team is hosted in the Rhône-Alpes Institute for Complex Systems, IXXI, located in Ecole Normale Supérieure de Lyon. IXXI is promoting trans-disciplinary research, in particular with social sciences, thus facilitating the establishment of connections with researchers in fields such as economics, history, law, etc.

8.1.2. ARC6 "Innovative Services for Social Networks"

DICE is involved in a regional project of the Rhône-Alpes region, ARC6 "Innovative Services for Social Networks", with Telecom Saint Etienne.

8.2. National Initiatives

8.2.1. ANR

DICE is involved in an ANR project, which started at the end of 2013

- C3PO, on Collaborative Creation of Contents and Publishing using Opportunistic networks, with LT2C Telecom Saint-Etienne, INSA LYON, IRISA, ChronoCourse, et Ecole des Mines de Nantes.

8.3. European Initiatives

8.3.1. FP7 & H2020 Projects

DICE is involved in the CSA project "Big data roadmap and cross-disciplinarY community for addressing socieTal Externalities (BYTE)", Objective ICT-2013.4.2 Scalable data analytics (c) Societal externalities of Big Data roadmap.

8.4. International Initiatives

8.4.1. Inria International Labs

Dice is involved in IPL CityLab@Inria which studies ICT solutions for smart cities. Dice takes part in the *Platforms and City Governance* theme. Dice focuses on analysing and forecasting the role of intermediation platforms in the governance.

8.4.2. Inria International Partners

Dice is associated with the Institute of Massive Computing of ECNU, East China Normal University, in the framework of Joriss, associating ENS with ECNU. The project which focuses on "Promises of intermediation platforms for services frugal in resources" is headed by Aoying ZHOU on the ECNU side.

9. Dissemination

9.1. Promoting Scientific Activities

9.1.1. Scientific events organisation

9.1.1.1. Member of the organizing committees

- Stéphane Frénot, French Tech, représentant de la COMUE de Lyon
- Stéphane Grumbach, ANR, Comité de Pilotage Scientifique du Défi 8 « Sociétés innovantes »
- Stéphane Grumbach, scientific committee Global Forum
- Stéphane Grumbach, scientific committee Collège des Bernardins, Journalisme et bien commun à l'heure des algorithmes,
- Stéphane Grumbach, scientific committee BlendWebMix, annual conference, Lyon

9.1.2. Scientific events selection

9.1.2.1. Chair of conference program committees

- Stéphane Grumbach, co-chair Seminar Intermediation and Smartness, Anthropocene Curriculum, The Technosphere Issue, Haus der Kulturen der Welt, Berlin, 15-23 April 2016
- Stéphane Grumbach, co-chair Working group on digital sovereignty with UC Berkeley, Chaire Castex, Les Houches 8-10 december 2015.

9.1.3. Invited talks

- Stéphane Frénot, Plateformes d'interme´diations : Le Web, le temps et ... javascript Inforsid, mai 2015

Stéphane Grumbach has given the following invited talks:

- Political challenges of intermediation platforms, Lunch Lecture at TU Delft - Faculty of Technology, Policy and Management, Delft, 16 December 2015
- Libérer les données dans la ville intelligente : de la défiance à la confiance ? Panel Entretiens Jacques Cartier Smart cities, quelles réponses aux aspirations des citoyens ? Lyon, 2 décembre 2015
- Enjeux stratégiques et économiques des données personnelles, Entretiens Jacques Cartier, La vie privée à travers les cultures. Convergences et divergences dans un monde globalisé, Lyon, 30 novembre 2015
- Géopolitique dans l'espace numérique: la place de la Chine, Séminaire de l'Institut d'Asie Orientale, Lyon, 19 novembre 2015
- Challenges of algorithmic intermediation, ECNU, Shanghai, 21 october 2015
- Panel on New Innovation Strategies in a Challenging Global Environment Global Forum, Digitalization, From Disruption to Sustainability, Oulu, 28-29 september 2015
- Des masses de données aux services de masse globalisés, Assemblée Générale constitutive du GdR MaDICS, Groupement de Recherche Masses de Données, Informations et Connaissances en Sciences, Lyon, 24-25 juin 2015
- Place du numérique, le big data, les réseaux et l'intermédiation : une (r)évolution ? Assises scientifiques, département Environnement et Agronomie INRA, Pont Royal en Provence, 3 juin 2015
- Panel on Public data & Private Interests, Who Owns the Data?, An International Conference on Digital Assets, Data Philanthropy and Public Benefit", BIS 2015, Berkeley, May 14th, 2015
- Les bouleversements politiques et économiques dans la société numérique, Conférence de l'Institut des Sciences du Numérique, Hôtel Potocki, Paris, 9, 10 avril 2015 video
- Maître de la Donnée, Maître du monde, avec Gilles Babinet, Congrès Big Data, CNIT, Paris, 10 mars 2015
- Privacy and Big Data, Byte session, Computers Privacy and Data Protection Conference CPDP2015, Brussels, 22 January 2015

Aurélien Faravelon has given the following talk:

- Education in the age of platforms, ECNU, Shanghai, 21 october 2015

9.1.4. Scientific expertise

Stéphane Grumbach has been involved in public hearing in the political sphere

- Stéphane Grumbach, Big Data : création de valeur, enjeux et stratégies de régulation, Cycle "Mutations technologiques, mutations sociales", France Stratégie, Paris, 12 novembre 2015
- Stéphane Grumbach, La place du traitement massif des données (Big data) dans l'agriculture, audition publique de l'OPECST, Assemblée nationale, Paris, 2 juillet 2015
- Stéphane Grumbach, Des données aux plateformes d'intermédiation : une disruption en profondeur, Journée numérique au Sénat, Paris, 11 février 2015

9.1.5. Research administration

Stéphane Grumbach is director of IXXI, the complex Systems Institute.

9.2. Teaching - Supervision - Juries

9.2.1. Teaching

Licence : Stéphane Frénot, Stéphane Grumbach: Twitter, Facebook et le Web2.0, Module INSA Lyon,

INSA, Stéphane Frénot, Agility: A 32 hours optional course on agile software development presenting both iterative (SCRUM) and stream based approaches (LEAN IT). M1. (since 2011)

INSA, Stéphane Frénot, Innovating Project: Supervising 250 hours student project aim at managing innovating projects. Each student group leads its own subject during one semester. All projects and organizational details are publicly available here: http://tc-pi.fr M1 (Since 2006)

INSA, Stéphane Frénot, Learn Other Languages: The aim of the course is to improve one's skills in current state-of-the-art programing and discover different ways to develop using mainly web-oriented programming languages. M1 (Since 2013)

Licence : Robert Riemann, INSA, Algorithmique et programmation 1, 27HETD, L1, INSA Lyon, France

Master : Aurélien Faravelon, Réseaux informatiques et recomposition des frontières sociales, 3HETD, M2, EHESS, France

Master : Aurélien Faravelon, Master Biosciences, 3HETD, M1, ENS Lyon, France

Master : Stéphane Grumbach, Le pouvoir aux algorithmes, introduction du Mooc "Villes intelligentes : défis technologiques et sociétaux", MOOC IPL Citylab, 2016

Master : Stéphane Grumbach, Des masses de données à l'intermédiation algorithmique, les grandes plateformes numériques, une disruption politique, Réseaux complexes: une approche interdisciplinaire, ENS Lyon, mars 2015

9.2.2. Supervision

PhD in progress : Etienne Brodu, DataFlow compilation from JavaScript, Jan 2013, Stéphane Frénot

PhD in progress : Robert Riemann, systemes de vote decentralisés, sept 2014, Stéphane Grumbach

9.3. Popularization

- Stéphane Grumbach, Big Data : quel impact sur la relation aux citoyens ? Journée #ComDemainIDF de la Région Ile de France, Paris, 13 octobre 2015
- Stéphane Grumbach, Comment le numérique change-t-il la société ? Cycle de conférences Homo numericus, Fête de la science, Bourg-en-Bresse, 10 octobre 2015
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