Bicocca EXPERT WEEK

Bicocca Expert Week Detailed Program
Università di Milano-Bicocca - Aula Martini – Edificio U6

Monday, February 26th

9.00
M.C. Messa, Università di Milano-Bicocca, Rettore
Welcome Address

9.15-12
S.Ceri and A. Canakoglu, Politecnico di Milano
Modeling and Analyzing Big Genomic Data

Genomic Data will be the biggest source of data by the year 2025, beyond astronomy and much beyond socially produced content (Facebook/Twitter/Instagram). In this lesson, I will explain how the DNA in genome can be seen as a "living creature" that emits signals and how such signals can be interpreted in order to infer relevant information towards improving biology and medicine. In essence, I will explain that integration of heterogeneous datasets is the key factor, and that domain-specific operators add to general-purpose operators in order to build a query language for genomics. During the second part of the lesson, together with PhD students and Post-Docs from my group at Politecnico, I will explain how to perform genomic queries over public repositories, and then hint to many data analysis problems.

12-13
A.Policriti – Università di Udine
Bioinformatics and Sequencing

Sequencing and assemblying genomes—namely, the activities consisting in determining bases (characters) of short dna fragments and rebuilding (assemblying) the read fragments in a single sequence—constitute the first true point of contact between Computer Science and Biology. They opened the way to a season of opportunities and challenges at the center of the triangle whose vertices are Information, Life Sciences, and Technologies.
In my talk I will discuss these three themes, starting from an historical perspective and a personal involvement, passing through the revolution caused by the introduction of new sequencing technologies, and arriving to what I believe are the most important challenges of today's data production and management in the field.

14-15.30
R. Schettini – Università di Milano Bicocca

Modeling and recognition of visual data using CNNs

The automatic recognition and description of visual data is a challenging problem in multimedia and computer vision, with a huge variety of applications. In this section I will talk about the use of deep neural networks to extract rich scene annotation and description from visual data. Several examples, mainly related to image and video recognition in large multimedia archives, and to automatic computation of their attributes will be discussed.

15.30 – 17.00
S. Iacus, Voices on the Blogs and Università degli Studi di Milano
How to create new value with Data Science? Challenges and perspectives of an old yet new discipline

Data Science is becoming a buzz word to describe a conscious approach to data analysis over big and unstructured data. This discipline helps in discovering new patterns or understand better proprietary and open data by mixing competences in computer science, statistics and field experience. It is also a cultural approach to data analysis which helps to extract hidden value and create new business opportunities. In this talk, we will discuss some of the opportunities, the needs and the approach of a young startup which operates in this field as well as some tricks based on personal experience.

Tuesday, February 27th

9.00-11.00
Chiara Francalanci – Politecnico di Milano
E2MC: exploiting social media for rapid mapping during emergencies

In the context of the E2MC project, our research has faced the challenge of extracting useful information from social media for rapid mapping purposes. Rapid mapping represents the activity of producing maps of a geographical zone hit by an emergency fast enough to support emergency management as soon as the emergency starts. Rapid mapping has very specific and challenging requirements. First, multimedia content, especially pictures, is far more useful than text. Second, content is not useful unless it is geolocated with enough precision to be useful for mapping purposes. Third, content should be rich and, hopefully, redundant to reinforce mapping decisions. As part of the E2MC project, we have designed a content geolocation algorithm that focuses on the geolocation of multimedia content that is not natively georeferenced. The approach is novel as the geolocation of posts is based on the concept of context. A post's context is defined as the set of all information that characterizes the post both directly, i.e. the post's content and metadata, and indirectly, i.e. describing how the post is connected with other content through its author's interactions with other authors. The algorithm's preliminary testing on a case study shows that the concept of context is effective at identifying multimedia content that is potentially useful for mapping purposes and at geolocating that content by leveraging all the information that can be associated with a post, that is text, links, social network connections and dynamic time-dependent social interactions.

11.00 -13.00
Monica Scannapieco - Istat
New sources for Official Statistics: IT Challenges

Big Data sources are a new and relevant information pool, which can potentially provide timely and accurate information for statistics at the service of citizens and policy-makers. However, processing Big Data poses several IT issues in most of the phases of the statistical production process, namely: Collect, Design and Processing/Analysis. This talk will illustrate such challenges as well as solutions experimented in concrete Big Data projects at National and European level.

14.00 -16.00
Diego Zardetto - Istat
Methodological Issues in Big Data Processing for Official Statistics

In recent years, the Official Statistics community has been converging toward the consensus that Big Data sources represent an unprecedented opportunity to modernize National Statistical Institutes. However, Big Data do not naturally fit within the established quality framework of Official Statistics, which is based on statistical surveys and administrative data sources.

As a consequence, the development of sound methodologies to extract valid statistical information from Big Data is still fairly embryonic. How to guarantee the quality of Official Statistics products based on Big Data is a matter of current research.

16.00 – 17.00
Carlo Reverberi
Neuroscience: from biology to (big) data science

Functional Magnetic Resonance Imaging (fMRI) was introduced in the early ’90 and immediately was welcomed as a revolutionary opportunity to explore in vivo human brain functionality. During the 30 years of development of the technique, the neuroscience community as gradually become aware of the importance of building large open data repositories, and of using more and more sophisticated data analysis techniques. I will review recent developments and sketch possible future directions

Wednesday, February 28th

9.00 – 10.30
G. Martini
The use of big data in air transportation network

Air transportation in one of the sector with a large amount of stored information. The latter is due to the current standard in bookings, which is always recorded digitally. Our research group has one main source of big data: the official airline guidelines (OAG) database. It provides information on all scheduled flights worldwide. This allows to build variables regarding service supply, e.g., seats, frequency, code-sharing, type of aircraft in operation. Moreover it allows to build data for network analysis, in order to identify the most important airports in the global network. Last, OAG provides information on pricing and bookings, so that airline competition analysis can be performed.

10.30 – 12.00
R. Ricci, INVALSI
Data for the educational policies

In recent years, data has gained an increasingly important role in the educational field as well. Researches and surveys have been developed at international and national level for the systematic and orderly collection of data on student learning levels and on the functioning of the school system. In this perspective, INVALSI conducts annual surveys on student learning and provides data to the system and stakeholders for a rational government of the national school system. Recently, INVALSI has provided schools and all stakeholders with advanced tools for reading data, in particular the school value added.

12.00 -13.00
E. Misuriello - Esri
The science of where from Analytics to Artificial Intelligence, through the IOT

The world has always been very dynamic, because of anthropization and natural phenomena. Men have always been great effort to read these transformations for making better life by the interpretation of all phenomena. The aims is improving the quality and effectiveness of decision-making processes, increasing protection from risks, improve all operational processes (less time and costs). This activity has always been based on the study of information obtained in data acquisition and analysis processes. Since forever technology is used acquire always more consistent data, increasing range and accuracy, more than our sense can do! So the idea to put the sensors in all "Things" and use the "Internet" as network to interconnect them with the systems, realizing IoT. That architecture is providing billions of data the Big Data. Through Big Data managing and analyzing we can get useful information. Position and Time are the characteristics common to every single data and this peculiarity, together with the GIS technology realizes “The Science The Where”. Esri's ArcGIS platform is the most widely used Web GIS solution in the world. It is used in all application areas including land management, defense,

emergency, management of technological networks, in agriculture adding the significant value that the use of geographical information can provide.

14.00 – 16.00
A. Fuggetta – Cefriel
E015 Ecosystem: Unlocking Business Value

One of the most important basic principles of a Digital Ecosystem is "unlocking business value": a digital asset (information or functionality) that has been created for a specific purpose, can unlock additional value if made available as API also to other consumers, thus enabling new and unpredictable usage scenarios. Fuggetta will explain the connections between Digital Ecosystems, technologies and organizations, and how APIs allow businesses to monetize data, forge profitable partnerships, and open new pathways for innovation and growth.

16.00 – 17.00
M. Albini - IHC
The use of all data of an hospital for quality and research

In Healthcare is growing the amount of clinical data. This is a big opportunity for developing new models of use of that data for analysis and for interaction with clinicians on the patient pathways of care. To do this, we need to know how to manage multiple sources of data, how to analyze them and how to present to the stakeholders. We have the experience of a Research Hospital that uses an Electronic Medical record, has built a system for managing Quality indicators and is developing a methodology for using all these data also for clinical research.

Thursday, March 1st

9.00 – 11.00
M. Zanker - University of Bolzano
Recommendation Systems - Challenges for Data Scientists

The talk will survey the history and the state-of-the-art of research in recommender systems. It will discuss current practices as well as open and unresolved problems and challenges of this application field. Furthermore, references to practical tools and resources will be give

11.00 – 12.00
L. Tremolada - Il Sole 24 Ore
Data Journalism

From data viz to newsgames, here is how interactivity (and data science/statistics) will save journalism

12.00 – 13.00
D. Porro – Università di Milano Bicocca
Turning ideas into projects and innovation into Country's success

In the era of competition, knowledge is the decisive factor to be able to contend. We need to play a primary role in the integration of knowledge and knowledge must be leader of sustainable development in the Country's System. All this first requires an University entrepreneurial culture (.. this could requires a modernization of higher education, a rethinking of the education for students with attitude) and then the linking of Science/Technology providers with Science/Technology seekers for job creation and economic growth. Actions carried out in this respect will be presented.

Bicocca EXPERT WEEK

Thursday, March 1st

The "Università degli Studi Milano Bicocca", organizes on March 2, 2018 a

SEMINAR;
THE GENDER GAP IN EDUCATIO AND RESEARCH

14.00
M. Calloni - Università di Milano Bicocca
Welcome Speech
Nonostante le apparenze di libertà e di diritti acquisiti, molte sono ancora le differenze che caratterizzano le opportunità riservate a uomini e donne. Nel "Global Gender Gap Index 2017", elaborato dal World Economic Forum, l'Italia occupa la 82esima posizione su un totale di 144 Stati esaminati per quanto concerne l'uguaglianza di genere. Il Report indica un arretramento generalizzato nei quattro ambiti analizzati (economia politica, salute ed istruzione), rispetto all'anno precedente, quando l'Italia ricopriva il 50esimo posto). In particolare, il Report sottolinea che il 61,5% delle donne italiane sono retribuite in modo inadeguato o non ricevono alcun compenso. Inoltre, nonostante che il divario di genere sembri essere stato colmato in ambito educativo, tuttavia rimangono alcuni divari, come nel campo dell'Information and Communication Technology che rimane pressoché di appannaggio maschile. A patire da tali dati, l'incontro proposto ha lo scopo di riflettere sulle difficoltà che ancor oggi le donne italiano incontrano nel mondo del lavoro, tanto da riconfermare un tradizionale gender gap.

14.15 – 15.00
G. Baccarin – Mipu
What do we do tonight? What we do every night: try to conquer the world. 5 unexpected sources of Bias to manipulate our vision.

Speech freely taken from "The little finger with the Prof": how artificial intelligence can conquer our world. Research and Practical Case Studies of the most recent ethical challenges in artificial intelligence programming: BIAS, attention economy and gender diversity.

15.00 – 16.00
C. Milani
Experiences in University/Private sector collaborations on gender gap issues: past, present and future

In this speech I will describe my work and life experience, firstly in the scientific research environment (Nuclear Physics) and later on in a world leading tech company as University relations manager, where I have been working for more than 30 years.

Particularly, I will describe the company's policies for gender diversity, in Italy and WW, along with some of the initiatives that I have been organizing and put in place with some italian schools and Universities. One of the purposes of my job was helping students, especially female students, to walk around and get confident with scientific and technical disciplines, in order to reduce technical schools' and scientific professions' gender gap, which is definitely a hot topic for our country.

16.00 – 17.00
A. Rula - Università di Milano Bicocca
Networking Networking Women

Networking Networking Women (N2 Women) is a discipline-specific community for researchers in the communications and networking research fields. The main goal of N2 Women is to foster connections among the underrepresented women in computer networking and related research fields. N2 Women allows women to connect with other women who share the same research interests, who attend the same conferences, who face the same career hurdles, and who experience the same obstacles. We will discuss these topics plus others such as ‘attracting women in computing and computer science’ and ‘the barriers facing women to enter in a scientific career’.

Bicocca EXPERT WEEK

Friday, March 2nd

The "Università degli Studi Milano Bicocca", in collaboration with "The Innovation Group" organises on March 2, 2018 a:

SEMINAR:
"MYTHS AND REALITY OF ARTIFICIAL INTELLIGENCE"
Theoretical issues and practical developments

Welcome speech: Giancarlo Mauri, Head of Department of Informatics, Systems and Communication (DISCo)
Chairperson: Giulio Giorello, Full Professor of Philosophy of Science, Università degli Studi, Milano (tbc)

Speakers:

- Stefania Bandini, Complex Systems & Artificial Intelligence Research Center Department of Computer Science, Systems and Communication University of Milano-Bicocca
- Giorgio de Michelis, Full Professor of Interaction Design and Informatics for Organizations, University of Milano-Bicocca
- Derrick de Kerckhove, Professor, Università Federico II Napoli, formerly Director McLuhan Program in Culture & Technology, Toronto
- David Orban, Founder, SingularityU Italy Summit
- Giacomo Tesio, Programmer
- Carlo Batini, Presidente del Corso di Laurea Magistrale in Data Science, University of Milano-Bicocca
- Roberto Masiero, Presidente, The Innovation Group

THE THEME OF THE SEMINAR:

Which are the theoretical, philosophical foundations of what we call "Artificial Intelligence? And which are its main social and ethical implications, challenges and concerns?"

According to Luciano Floridi ("The Fourth revolution") two souls of A.I. are facing each other: the engineering and the cognitive one. This brings us back to John Searles "Chinese room" argument, or, in other terms, to the famous "Turing test".

Are we really facing a "weak" and a "strong "A.I."? And do we agree that what we see as major achievements of A.I. are simply the results of powerful syntactic engines, capable of manipulating enormous arrays of data, but structurally unable to achieve the semantic level, where you have to manipulate not simple data, but information – data with a meaning?

As Floridi says: “The snag is semantics. How do data acquire their meaning? This is known in A.I as the “Symbol grounding process”.

Somebody, as Eric Schmidt, believes that we are fast approaching this level. Floridi on the opposite thinks that we are very far from it and that, while the engineering souls of A.I. has achieved excellent results, the cognitive approach didn’t go very far at all.

And while, according to a purely “syntactic” approach, the statement of Chris Anderson, «The end of theory: The data deluge makes the scientific method obsolete» (2008) makes perfect sense, this statement on the opposite, according to a semantic perspective, could become very questionable.

All this has to do with a major debate related to the philosophical and the knowledge theory; but relevant issues are even being raised as far as the ethical implications of A.I. are concerned, for instance as far as the relationship between predictivity and anticipation is concerned.

And all these theoretical issues entail major practical implications: is it legitimate talking about “intelligent” refrigerators, laundry machines, or even “intelligent” smartphones with a neural processor, or was it right E. W. Dijkstra when saying that “The question of whether a computer can think is no more interesting than the question of whether a submarine can swim”?

On the other hand, there are schools of thought that on the opposite theorize that in a few decades the intelligence of the machine will surpass the combined brain power of all human beings combined.

Consequent practical perspectives are, of course, very different. But we should not proceed with engineering new architectures, devices, and tons of gadgets, without discussing in depth the underlying theoretical issues.

This is the reason why we believe that this opportunity of sharing and discussing different views will be welcome by all, philosophers, academics, practitioners, and industry leaders.

PRELIMINARY ABSTRACTS

Stefania Bandini, Complex Systems & Artificial Intelligence Research Center Department of Computer Science, Systems and Communication University of Milano-Bicocca
“Artificial Intelligence: breaking borders towards new challenges”

Artificial Intelligence (AI) is becoming a popular scientific and technological issue, pervading future scenarios of our living. Many applications of consolidated AI-based solutions are active and used in several fields of everyday life, despite of its visibility. AI approaches are now used to improve more traditional ICT techniques, allowing to break the borders of disciplines through new integration possibilities, and offering unexpected spaces to the creation of a new generation of complex

technological systems. In the "back stage", AI scientists are facing the era for the development of innovative ideas, models and solutions which will feed our research and living moods. The main purpose of this talk is to illustrate some of the future AI-based scientific and technological scenarios in order to give a taste of its most challenging (but realistic) goals, from cyber-physical systems to new forms of nature-based and collective intelligence.

Giorgio De Michelis, Full Professor of Interaction Design and Informatics for Organizations at the University of Milano-Bicocca
"Intelligent Machine or Knowledge Technology?

In the first years of the third millennium the discussion about Artificial Intelligence regained momentum, when, thanks to the development of hardware and software technology, leading researchers and practitioners of Artificial Intelligence raised with new systems, new visions and new theories the challenge of machines versus human intelligence. In this text I will shortly survey this debate, avoiding to discuss the ethical legitimacy or the reliability of the objectives of Artificial Intelligence. Even if human intelligence has dimensions that artificial 'super' intelligence can not take into consideration, cognitive computing systems, in fact, have become really and definitively better, at the level of pure rationality, than human beings. Instead of putting machines in competition with human beings I suggest to consider them "rational" aids and/or supports of the latter.
Keywords
Cognitive Computing, Situated Knowledge, Rationality

Derrick de Kerckhove, Professor, Università Federico II Napoli, formerly Director McLuhan Program in Culture & Technology, Toronto
"The acceleration of Artificial Intelligence by connectivity"

Connecting intelligences is not reserved to humans. Now machines do it too.
It is largely once the old expert systems began to interconnect among themselves, along with a new, critical, access to huge data sources, that AI came back to the fore of public attention, where it had been lying fallow for decades.
There is evidence that AI works in networks more and more connecting and interconnecting with data banks as well as screens and machines.
The growing presence of Big Data is changing the concept of intelligence itself.
It is quite possible to imagine, and eventually construct, a sort of Universal AI that would access all programs, all data banks, all communications systems, all sensors.
People and institutions would simply plug into it, the way we plug into the Internet today. Such a powerful AI would bring with it a kind of datacracy (already shaping up fast in China).
Where does that leave us? At some point, we may have to train AI to provide questions, not only answers.

David Orban, Founder, SingularityU Italy Summit
"Thriving in a world dominated by AI"

Giacomo Tesio, Programmer
"The delusions of Neural Networks"

What is the essence of Neural Networks? Why they need big data set?
Why they work so well in image recognition? Where is the intelligence?
Who is accountable for them? And what are the real dangers?
The hype around artificial intelligence is hurting the AI itself.
Any humble programmer can see that we need a more scientific approach to the matter.
And we have to start by changing the language we use, clearly stating what we cannot do.

Carlo Batini, Professor, Head of Master Degree in Data Science, Università degli Studi Milano Bicocca
"Data Science ethical and knowledge challenges and concerns at a glance"

There are two cultures to reach conclusions from data:

- One assumes that the data are generated by a given stochastic model
- The other uses algorithmic models and treats the data mechanism as unknown

The two cultures are facing each other and their clash, together with the progressive development of a cognitive approach, is raising major knowledge and ethical challenges, that will be reviewed and analysed in the course of the speech.

Roberto Masiero, President, The Innovation Group

"Social implications of the A.I. revolution: should we treat data as labor?"

A.I. is getting better all the time, and is going to transform a host of industries. But the algorithms that make clever machines tick must usually be trained on massive amounts of data, that are mostly provided by users, who "pay" for useful free services by providing firms with the data they crave. Similarly, in order to learn for instance to recognise a face, machines must be trained by human beings who teach them.
This way the data become part of the firm's capital and a major source of competitive advantage. All the value is intercepted by the firms that actually act as "data refineries".

Even so, as AI improves, the amount of work made vulnerable to displacement grows, and even more of the value generated in the economy accrues to profitable firms instead than workers, or users who were originally the owners of the data.

But the free-data model is at least partly responsible for the still small contribution of AI to overall productivity growth. A school of thought believes that, rather than being regarded as capital, data should be treated as labour and regarded as property of those that generate that information and provided to firms under fair contracts and related payments, in money or services.
This would break-out the monopsony of the largest digital platforms and unleash a competition that would result in a higher contribution of AI to the productivity of the overall economic system and to a fairer redistribution of the value generated by the data.