Reconsidering Humanity:

Big Data, the Scientific Method, and the Images of Humans

Symposium on June 25and 26, 2015, Visual Arena Lindholmen,

Lindholmen Science Park, University of Gothenburg, Sweden

Theme and Organizers

This symposium is going to explore the promises, visions, and hopes that one finds in current discussions about big data technology. Regarded as a social, intellectual, cultural, and commercial "movement", big data carries revolutionary expectations for the possibility of exploring humans scientifically. If the most ambitious visions and projections were to materialize, culture and society could face a paradigm shift in terms of the scientific method's potential to contribute to previously inaccessible understanding of the nature and essence of humans and humanity. The purpose of the symposium are to initiate an in-depth and critical exploration and discussion of in what way and to what extent this grand prospect for big data to profoundly change the premises of the scientific research on humans and humanity may hold up to scrutiny, and what consequences this aspect of big data would have on the evolving images of humans, humanity and, ultimately, human identity. The backbone of the symposium will be oral presentations by some dozen specially invited key-note speakers. Particular emphasis is placed on forward-looking, bold, visionary, and provocative ideas. The symposium will also be open to a limited number of specially invited participants in the auditorium (in total 70 symposium attendees), a form of advanced seminar or roundtable.

Organizer Urban Strandberg, Department of Political Science, University of Gothenburg Contacts: urban.strandberg@gu.se, Co-organizer Christian Munthe, Department of Philosophy, Linguistics and Theory of Science christian.munthe@gu.se

Hosted by Centre for European Research at University of Gothenburg (CERGU) www.cergu.gu.se

Sponsored by the Swedish research foundation Riksbankens Jubileumsfond (RJ), sector committee TIF – Technology, Institutions and Change http://www.rj.se/en/About-RJ/Sector-Committees/Technology-Institutions-and-Change/

Key-note speakers

Palle Dahlstedt, composer and improviser, Obel Professor in Art & Technology at Aalborg University; associate professor in applied information technology, University of Gothenburg and Chalmers University of Technology; lecturer in composition at the Academy of Music and Drama, University of Gothenburg

Paula Droege, senior Lecturer in Philosophy, Pennsylvania State University

Carrie Figdor, associate Professor of Philosophy at the University of Iowa

Staffan I Lindberg, professor, Department of Political Science, University of Gothenburg

Dawn Nafus, anthropologist at Intel Labs, PhD from University of Cambridge

Lev Manovich, professor of Computer Science, The Graduate Center, City University of New York; Director, Software Studies Initiative (research on big cultural data)

Anil Seth, professor of Cognitive and Computational Neuroscience (Informatics), Co-Director (Sackler Centre for Consciousness Science), Reader in Informatics (Centre for Computational Neuroscience and Robotics)

Irina Shklovski, associate professor in the Technologies in Practice and Interaction Design (IxD) research groups at the IT University of Copenhagen in Denmark.

Barry C Smith, philosopher and Director of the Institute of Philosophy at the Institute of Advanced Studies at University of London, co-director of the Centre for the Study of the Senses

Patrik Svensson, professor in the Humanities and information technology, HUMlab, Faculty of Arts at Umeå University

Paul F.M.J. Verschure, Ma. and PhD in psychology, professor, Catalan Institute of Advanced Research (ICREA) Technology Department, Universitat Pompeu Fabra, Center of Autonomous Systems and Neurorobotics (NRAS), Scientific Director of the Master in Cognitive Systems and Interactive Media (CSIM)

Programme

Thursday June 25

09.30   **Opening of symposium: welcome and introduction**

Urban Strandberg & Christian Munthe – organizers

Göran Blomqvist, Managing Director, Riksbankens Jubileumsfond

10.00-11.00   **Big Data and Shifting Concepts of the Human**

Carrie Figdor, Associate Professor of Philosophy at the University of Iowa

11.00-11.30   **Coffee**

11.30-12.30   **Big Data in the Brain**

Anil Seth, Professor of Cognitive and Computational Neuroscience, University of Sussex

12.30-13.30   **Sensing and Imaging Big Data**

Palle Dahlstedt, composer and improviser, Associate Professor in applied information technology, University of Gothenburg and Chalmers University of Technology

13.30-14.30   **Lunch**

14.30-15.30   **Getting Out of the Clouds: What the Quantified Self Community and Anthropologists have in Common**

Dawn Nafus, Anthropologist at Intel Labs, PhD from University of Cambridge

15.30-16.00   **Coffee**

16.00-17.00   **Salvaging Humanity from Big Data Nihilism**

Paul Verschure, Ma. and PhD in psychology, Professor, Catalan Institute of Advanced Research

17.00-17.30   **Discussion and end of day 1**

Friday June 26

09.30-10.30 **Big Data for Us**

Barry C Smith, philosopher and Director of the Institute of Philosophy at the Institute of Advanced Studies at University of London, co-director of the Centre for the Study of the Senses

10.30-11.00 **Coffee**

11.00-12.00 **Cultural Analytics: Analyzing and visualizing cultural patterns using big data**

Lev Manovich Professor of Computer Science, The Graduate Center, City University of New York; Director, Software Studies Initiative

12.00-13.00 **Visualizing Big Data: Inside and outside the single screen**

Patrik Svensson, Professor in the Humanities and information technology, HUMlab, Faculty of Arts at Umeå University

13.00-14.00 **Lunch**

14.00-15.00 **Big Data on Varieties of Democracy**

Staffan I. Lindberg, Professor, Department of Political Science, University of Gothenburg

15.00-16.00 Xx

Irina Shklovski, Associate Professor in the Technologies in Practice and Interaction Design (IxD) research groups at the IT University of Copenhagen

16.00-16.30 Coffee

16.30-17.30 **Not by data alone: The promises and pitfalls of data analysis in understanding consciousness**

Paula Droege, Senior Lecturer in Philosophy, Pennsylvania State University

17.30-18.00 **Discussion and end of symposium**

Abstracts

Big Data and Shifting Concepts of the Human
Carrie Figdor

Abstract
The analysis of Big Data will reveal a wealth of new patterns in the behavior of human and non-human systems. Among the most important of these will be patterns (or models) that can also explain or predict the behavior of additional systems. While the patterns' original interpretations use concepts appropriate to the original systems, extending such patterns typically involves extending the concepts to the new systems as well. In this way Big Data will yield radical new pressures to extend to new domains concepts that have to now been considered to apply exclusively to humans, including in particular mental concepts. In this talk I will explain how this conceptual extension works and the ways in which these shifts promise to affect our understanding of what it is to be human and what it is to be non-human.

Dr. Carrie Figdor, Associate Professor, Department of Philosophy and Interdisciplinary Graduate. Program in Neuroscience, University of Iowa, 260 EPB, Iowa City, IA 52242, (319) 335-0093
carrie-figdor@uiowa.edu, https://uiowa.academia.edu/CarrieFigdor
http://clas.uiowa.edu/philosophy/people/carrie-figdor

Big data in the brain
Anil Seth

Abstract
The brain is arguably the most complex single object in the known universe, making it no surprise that the neuroscience is generating stupendous quantities of data at multiple levels of description. Flagship projects like the Human Brain Project (https://www.humanbrainproject.eu) and the Human Connectome Project (http://www.humanconnectomeproject.org/) exemplify the assumption that 'big data' provides a key to understanding the link between brain and mind, catalyzing a new understanding of human nature in health, and in disease. Yet these flagship projects face deep problems, as I will describe in the first part of my talk. In the second, I will explore the idea that the brain itself faces a data deluge, in the form of a continual flood of high bandwidth, inherently noisy, and ambiguous sensory signals. How does the brain solve its own internal 'big data' problem? I will sketch one promising solution, which is that brain instantiates a 'prediction engine' which continually induces and refines predictive models of the causes of its sensory signals, according to Bayesian principles. Intriguingly these principles find a parallel heritage and contemporary expression within artificial intelligence, exemplified by the 'deep learning' algorithms that are currently extremely popular (http://deepmind.com/). This leads to a provocation: to what extent will 'big data' change our views on human nature by providing data, or by shaping our views on how the brain *deals with* big data?
Anil Seth, Sackler Centre for Consciousness Science, School of Engineering and Informatics, University of Sussex, Brighton BN1 9QJ, UK, a.k.seth@sussex.ac.uk,www.anilseth.com, www.neurobanter.com/, www.sussex.ac.uk/sackler, @anilkseth
Bio: Anil K Seth is Professor of Cognitive and Computational Neuroscience at the University of Sussex and Founding Co-Director of the Sackler Centre for Consciousness Science. He is Editor-in-Chief of *Neuroscience of Consciousness* (Oxford University Press) and was Conference Chair of the 16th Meeting of the Association for the Scientific Study of Consciousness (ASSC16, 2012). He has published more than 100 academic papers in a variety of fields, and he holds degrees in Natural Sciences (MA, Cambridge, 1994), Knowledge-Based Systems (M.Sc., Sussex, 1996) and Computer

Science and Artificial Intelligence (D.Phil., Sussex, 2000). He was a Postdoctoral and Associate Fellow at the Neurosciences Institute in San Diego, California (2001-2006). Anil is Editor and Co-Author of *30 Second Brain* (Ivy Press, 2014), was Consultant for *Eye Benders* (Ivy Press, 2013; winner of the Royal Society Young People's Book Prize 2014) and contributes regularly to a variety of media including the *New Scientist*, *The Guardian*, and the BBC.

Sensing and Imaging Big Data

Palle Dahlstedt, composer and improviser, Obel Professor in Art & Technology at Aalborg University; associate professor in applied information technology, University of Gothenburg and Chalmers University of Technology; lecturer in composition at the Academy of Music and Drama, University of Gothenburg

Getting Out of the Clouds: What the Quantified Self Community and Anthropologists have in Common
Dawn Nafus

Abstract
This talk will examine practices of enumeration from both an ethnographic and Quantified Self (QS) perspective. In a sense, both anthropologists and QS share the same problem: they are both concerned that contextual, embodied knowledges risk being left by the wayside in the urge to aggregate data across populations. Recent discussion in the QS community has focused on the possibility of "turning the evidence pyramid on its head," and moving away from randomized control trials towards self-experimentation as a form of scientific evidence-making. This reversal re-introduces situated knowledge in fascinating ways. It also very much questions how relations between the one and the many might unfold in a data-rich, sensor-rich setting—a setting in which situated knowledges might be valued more than god tricks, and data in one's hand is not merely on its way to the cloud. I will explore what this reversal could mean by unpacking the design process behind Data Sense, a software project which attempted to elaborate, in material form, the ethnomathematical underpinnings of self-tracking data exploration.

Salvaging Humanity from Big Data Nihilism
Paul Verschure

Abstract
Science has entered the era of "Big Data" or the "data deluge". By engineering ever more advanced instruments we are able to generate fast amounts of data that risk overwhelming our ability to process it. For instance, the ENCODE library of DNA elements now contains 15 terra bytes (TB) of data, that is $15 \cdot 10^{12}$ bytes, while the, so called, Square Kilometre Array radio telescope which will become operational in 2020 will generate 700 TB per second, a capacity that by far outstrips the capacity of the internet! New examples of impressive and ever more expansive data generators are reported daily. We must pose the question whether this transition is just a matter of scale or whether we are changing the way in which we do science and try to understand the universe and ourselves?
I argue that the notion of "big data" has both changed our model of science and can be seen as a next and logical stage in the study of mind and brain. We have moved from the traditional empirical cycle, where hypotheses guide the collection of data, to a model where we first capture data and postpone its interpretation to a post hoc, often machine based, analysis. This transition is accompanied by a scientific nihilism in the study of mind and brain, where we have regressed from the original aim to study subjective experience in 19th century structuralism via the empty organism of behaviourism, the disembodied mind of AI and the metaphorical biology of the late 20th century to the mindless

accumulation of brain data as exemplified by large-scale initiatives in the Western world. I will argue that this development is a great liability to our science and humanity.

I will argue that there is a way back from the scientific nihilism of big data, which entails a number of steps. First, we do need to set our sights on the understanding of the core faculty underlying our humanity: conscious experience. Second, a clear path of how we can transform big data into understanding and meaning is required: data itself is not enough we have to incorporate it in meaningful conceptual structures that depend on the human mind. My own research targets both these objectives. I will present both a embodied and psychobiologically grounded theory of consciousness based on the Distributed Adaptive Control theory of mind and brain and a new scientific instrument that has the sole purpose to reconnect the human mind to data or a datascope. The datascope accelerates the ability of humans to generate hypotheses, facilitating discovery and insight. I will present examples of the use of this instrument from the domains of the study of mind and brain and cultural heritage.

Paul Verschure, Synthetic Perceptive, Emotive and Cognitive Systems Laboratory, Center for, Autonomous Systems and Neurorobotics, Universitat Pompeu Fabra & Catalan Institute of Advanced Studies (ICREA), specs.upf.edu

Big Data for Us
Barry C Smith
Abstract
The promise of big data discoveries and findings suggest the emergence of not just more information but new forms of knowledge generation. However, the growing gap between data and narrative raises questions about whether minds like ours can encompass what's new. Finding meaning and significance is a deeply human activity reflecting our perceptions, needs and interests. Visualisation, sonfication and more may close the gap, but is there a cognitive closure to the human mind beyond which we can't reach, or will new forms or interaction or pattern making extend our current horizons?

Cultural Analytics: Analyzing and visualizing cultural patterns using big data
Lev Manovich
Abstract
The explosive growth of cultural content on the web and the digitization of cultural artifacts opened up fundamentally new possibilities for the analysis of cultural trends, patterns and histories. Today, thousands of researchers have already published papers analyzing massive cultural datasets in many areas including social networks, online video, web site design fashion photography, popular 20th century music, 19th century literature, etc. In my lecture I will show a number of projects created in my lab (softwarestudies.com) since 2008. They include comparison of 2.3 million Instagram images from 13 global cities (phototrails.net), visualizations and analysis of 10.5 million images shared in NYC (on-broadway.nyc), 1 million manga pages, and 1 million artworks from the largest network for "user-generated art." I will discuss how we combine methods from data science, media art, and design, and how the use of big data helps us question our existing assumptions about culture.

Visualizing Big Data: Inside and outside the single screen

Patrik Svensson

Abstract
What would big data be without visualization? And what would visualization be without the single screen? Starting out from the rather mundane example of presentation software such as PowerPoint I will discuss the conditioning of arguments and presentation embedded in such tools and associated infrastructure. PowerPoint is probably the most frequently used tool for presenting visualizations and does not only shape arguments based on visualizations but the infrastructure used to make such arguments. For instance, it can be argued that PowerPoint encourages a singular point of view through its reliance on single frames (both in the sense of a single screen and only one slide at a time).
The second part of the talk discusses and contrasts three examples of single-screen environments for big data visualization: the web, high-end display walls and immersive environments such as the CAVE. What types of argumentative and visualizing possibilities to these platforms offer? What are their cultural, aesthetic and epistemic contexts? The screen becomes a viewport, but what kind of viewport? What type of arguments are supported? A number of examples of visualizations will be used. The notion of intellectual middleware – the conditioning mechanism placed between backend (data, ideas) and frontend (interface) – will be used to discuss how data becomes visualization.
The final part of the talk engages with a specific infrastructure at HUMlab, Umeå University: a set of screen-rich environments used for multiplex argumentation and visualization. An initial point concerns the enacting of visualization in a multi-modal and performative environment rather than in a more traditional single-point setup where visualizations are presented to viewers. A newly installed display studio originally planned as a cinematic space exemplifies this point. Furthermore, a conference on "Genres of Scholarly Knowledge Production" (December 2014) serves a case study. Here participants were disallowed to use traditional presentation software and had to interact with specific multiple-screen infrastructure through a purpose-built media system.
The talk will be highly visual.

Big Data on Varieties of Democracy
Staffan I. Lindberg

Abstract
This presentation provides a tangible example and some reflections on the Varieties of Democracy (V-Dem) collection, processing, and visualization of big data. The presenter is one of the PIs for V-Dem and Director of the V-Dem Institute. In particular, the presentation will exemplify one answer to the question of how big data can contribute to bridging the gap between what is perceived as the subjective and the objective aspect of humans. V-Dem data consists of over 15 million data most of which are submitted as ratings on some 200 variables by country experts in various fields and on various countries. Using a state-of-the-art Bayesian ordinal IRT-model, these subjective ratings are combined and weighted to produce country-year point estimates of what is hoped to be objective and comparable measures of the actual situation "on the ground" across space and time in all countries of the world. The presentation will describe the process and protocols of V-Dem, as well as illustrate the results from a variety of issues covering things like behavior over the media, elections, legislatures, political parties, civil liberties, and civil society.

Xx
Irina Shklovski

Not by data alone: The promises and pitfalls of data analysis in understanding consciousness
Paula Droege

Abstract
Since the introduction of technologies such as the EEG, fMRI, and TMS, the deluge of neuroscientific data has been overwhelming. On one hand this new information has produced remarkable breakthroughs in our understanding of brain function and development as well as lifesaving treatments for trauma and disease. On the other hand, the lure and reward for explanations of mental phenomena in terms of simple, manipulable brain processes has led to questionable research methodologies and unsubstantiated claims. Controversies include the 'replicability crisis' in psychology (PPS 2012), the critique of fMRI based on interpretations of the BOLD signal (Logothetis 2008), and a renewed emphasis on individuals over techniques that average data across multiple subjects (Gayles and Molenaar 2013). Despite these criticisms, data analysis continues to be the foundation of grandiose visions for a comprehensive explanation of the mind. One expansive undertaking is the EPFL Human Brain Project which aims to produce a complete computer simulation of the brain. The model will incorporate all available molecular, cellular, and circuitry research and thereby "revolutionize technology, medicine, neuroscience, and society" (EPFL website). Another major research initiative takes as its focus the Information Integration Theory (IIT) of consciousness. According to Guilio Tononi (2012), consciousness is distinctive in its differentiation and its unity. The quantity of consciousness can be specified by the amount of information that is integrated into a functional system, while the quality of consciousness is determined by the kinds of information processed, within and between modalities. The theory combines these two aspects of information processing into the formula Φ which describes the level of consciousness of a system. A simple computation of Φ yields an answer to the longstanding question of whether something (an animal, an infant, a robot) is conscious. While the models produced by this massive computation of data will no doubt improve our understanding of brain function and capacity, a strict information processing approach cannot address the problem of semantic content. Assayed by Searle (1980) so long ago, the objection to a computational approach in artificial intelligence applies with equal force to computational neuroscience. Attempts by Dretske (1981) to extract semantics from information failed as well. For a full understanding of how consciousness is constituted by a brain, data analysis must be supplemented by a teleofunctional theory of mental representation (Millikan 1993; 2002; Droege 2003; 2009). Only by identifying the representational function of a brain process can we specify its content, and that will require an evolutionary, developmental, and dynamic account of an organism in its environment. Data analysis will play a role in this inclusive explanatory program, but explanation is insufficient by data alone.

Symposium theme

1. ”Big data”

Digital technology drastically increases opportunities and reduces costs for the allocation and analysis of data, at the same time as the internet and social media, helps to create gigantic volumes of digitally stored information about humans in all their dimensions such as body, thoughts, feelings, actions, appearance, life situations, placement in space and time, etc. In parallel and, supported by the same digital technology, increasingly sophisticated analytical and theoretical tools are evolving, facilitating analysis of these data sets to unravel and describe hitherto elusive connections, relationships, and complexities in the understanding of human nature.

Part of this consists of easily accessible data produced in real time, daily. Some data with direct view to be used and otherwise produced because it is possible. Sources consist partly of so-called user-generated content via button presses and taps on the smart phones, tablets, and personal computers as well as uploaded content in shared databases of social media formats: videos, images, audio, and texts.

Others kind of big data consist of from the daily user's viewpoint less visible side effects of the above, in the form of personal data and conduct surveys that are stored in databases for commercial or marketing purposes.

Data are also produced by digital sensors, including the so-called RFID technology, which is a technology to read information remotely by microchip transponders called tags. Digital sensors of this type are embedded in cars, oil pipelines, power lines, roads, traffic lights, water pipes, hospital instruments, etc. They are also common in terms of bus passes, lift tickets, road tolls, passport, anti-theft systems in shops, booking systems, library loans, etc.

Data is also produced in the form of traditionally "qualitatively" materials for arts and social science studies, which documents and informs about humans, human cultures, behavioral patterns, way of thinking, communities, etc. These databases already exist but are under substantial expansion, thanks to technological possibilities.

Data are also produced within existing and still growing repositories or "banks" of information from medical, neurological and/or scientific research, and related technical product development and business operations (ex. pharmaceutical and healthcare testing industry, implant industry, etc.). A strong trend is that these data bases are or will be open, i.e. available for research and scientific analysis.

Finally, the development of "Internet of things", E-/M-health, subcultural movements like "The Quantified Self", and the like, accelerate the development of large amounts of data that become available for analysis from the research perspective.

To the large-scale production of data belongs also the target-oriented fact-finding for intelligence, police, and military purposes. This information will, at least not in the first stage, be available for research - although the course used for the analysis and formulation of conclusions in these respective areas, may eventually manifest itself in the form of publicly noticeable consequences for scientists to ponder.

One particularly important aspect of big data is the development of methods that can be called "Big data Analytics". This refers to methods for fast, systematic, and adequate extraction of new information about people, people's bodily facilities, human behavior, thoughts, emotions, communities, lifestyles, cultures, etc. on the basis of big data. The temptation to manage the very large volumes of data runs on the hardware and software development, which is supported by increasingly sophisticated mathematical-statistical and measuring-theoretical models.

Voluminous and complex data sets require complicated systems and analytic methods for data processing, which are highly automatized. A particular feature of big data is that it is less homogeneous than usual bases of researchers' studies, and therefore requires special solutions – eg. for automatized analysis of combined qualitative and quantitative material from radically different fields.

Another special feature of big data analytics is the increasing ability to analyze and process data in real time, to control analyzes, statements, information, that is made on the basis of and/or is spread by the same technology that creates big data. This development contributes in itself to increase the complexity of big data, because it creates awareness of new types of information to store.

One more technical aspect of big data is a need for visualization. The combination of very large data volumes, complex systems, and analytical methods for the processing of data means that visualization is important in the research process, to provide the researcher with an overview of a vast and complex set of data, to design research and carry out analysis. That big data increase the dependence on visualization is also exemplified in the process where the research results are communicated to the public and the interests involved.

The above is what can be brought under the single category of "big data". But big data is also a kind of *movement* of ideas, practices, dreams, visions, and people. And it is primarily this aspect of big data that we focus on in this symposium. Some of the practices and ideas are already under discussion and scientific analysis. Big data applications in fields such as health, marketing, and surveillance, are studied and discussed by sociologists, lawyers, and philosophers among others. Another example of the big data movement is the approach known as "Digital Humanities".

However, it is none of these specific fields or areas that we want to bring into focus in this symposium, since there are already adequate activities started. What we want to do instead is to the discover, consolidate, explore, discuss, contextualize, historicize, and both criticize and exaggerate the claims, fears, hopes, descriptions, beliefs, and expectations about big data's impact on our overall understanding of humans and society that are assumed and canonized in what we perceive as the big data ideational movement.

2. Symposium objective

Regarded as a social, intellectual, cultural, and commercial "movement", big data carries revolutionary expectations for the possibility of exploring humans scientifically. If the most ambitious visions and projections were to materialize, culture and society could face a paradigm shift in terms of the scientific method's potential to contribute to previously inaccessible understanding of the nature and essence of humans and humanity. On that account, big data could produce new views of humanity, which could become a paradigm shift comparable to what came out of the Renaissance, the scientific revolution, and the quantitative social science major breakthrough after WWII.

Common to these historical events is that the shifts in perspectives and methods in the scientific study of humanity has had major consequences for how humans, both as individuals and as collective quantities, came to be considered from ideological, moral, cultural, political, and ontological perspectives.

The objective of this symposium are thus to initiate an in-depth and critical exploration and discussion of in what way and to what extent big data *could* change the premises of the scientific empirical research on humans, and the consequences big data in this particular respect would have on the images on humans, and ultimately to human identity. Notice that we therefore choose not to focus on other bases of the images of humans, for example religions. Also note that we do not take for granted that big data is already is, or will be developed into, a paradigm shift – it is the *ideas of the potential* for such a shift which is the focus of our interest.

It is in fact one of the objectives of the symposium to extract the early examples, but above all to discuss foresights, about the changes in the images on humans we may have to expect in the future *if* big data, will have the paradigmatic consequence that is promised of many in the big data movement. That is, *we do not* start from that big data has had an effect, or will have an impact, but that big data in all probability *may have* an effect.

In other words, our idea is that big data's paradigmatic breakthrough for the empirical research on humans has not yet occurred, and that is precisely therefore it is important, legitimate, and responsible to initiate a future-oriented and critical exploratory discussion, and from this formulate essential questions for research and public debate.

Substantially, we want to get to grips with the often explicit images on humans in prevalent taxonomies and conventions, embedded in scientific knowledge, such as: "humans are all different, humans are all equal", "every person is unique", "humans are complex", "humans are the same as ever" (cf. Levi Strauss the universally human),"humans cannot be seen as just biological or physical". The paradigmatic visions of the big data movement, holds of the prospects to empirically explore and reconsider the viability of such necessarily imprecise and vague but nonetheless deeply meaningful images and conceptions of humans.

3. Themes and questions

The backbone of the symposium will be oral presentations by some dozen specially invited key-note speakers. Particular emphasis is placed on forward-looking, bold, visionary, and provocative ideas. The symposium will also be open to a limited number of participants in the auditorium (in total 70 participants), to form a kind of advanced seminar or roundtable. The speakers are asked to reflect upon one or several of four aspects of the symposium objective:

1) *Big data – The vision of a paradigm shift in the empirical research on humans*: providing tangible examples and reflections on own and/or others' pooling, processing, and visualization of big data

2) *Images and ideas of the human nature in past, present, (and future) literature, art, and fiction*: providing perspectives and examples, own and others, of how artists and authors elaborate on images of the human nature, as partly based on an scientific empirical account

3) *Images on humans – theorizing the human nature*: providing examples and reflections, own and others, of how philosophers, psychologist, sociologists, anthropologists (et cetera) theorize the nature of humans

4) *The potential for and significance of scientific and social breakthroughs*: providing examples and reflections around the limits, opportunities, and challenges of the scientific method from a societal perspective, in the wake of big data

Presentations and discussions could be inspired by the following questions. Which images and ideas about the human nature would we more or less consciously carry with us, as tacit assumptions, when we design and get to grips with a big data-based scientific exploration of the human being? What new images and ideas about the human nature can be argued to be possible to create and promote through big data research, because it would allow us to analyze humans so empirically thoroughly? Which old images and ideas about the human nature may thus be possible to confirm or refute? Can big data contribute to bridging the gap between what is perceived as the subjective and the objective aspect of humans? Can big data render it possible to study the most personal an individual live through – the individual's own experience – by the use of the scientific method? Could big data help to bridge the classic challenges for the scientific method with respect to the study of humans, such as subjective-objective, individual-collective, and standardized-variable? Can the big data approach affect these contradictions, admit to standardize and individualize at the same time, and manage to explain and describe the subjective and the objective dimensions of human existence at the same time? What are the implications beyond science from the various answers to the above questions?