TOWARD PSYCHOINFORMATICS: COMPUTER SCIENCE MEETS PSYCHOLOGY

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ABSTRACT

Psycoinformatics is a present paper that provides insight into emerging research. This also emphasize the cooperation between the disciplines of psychology and computer science by handling large data sets derived from heavy used device, as smartphones or online social networking sites, to shed light on a large number of psychological traits, including personality and mood. New challenges are waiting for the psychologists in light which result in “Big Data” sets, because classic psychological methods will only be able to analyse the data derived from ubiquitous mobile devices, as well as other everyday technologies. As a result, psychologists must enrich their scientific methods through the inclusion of methods from informatics. The paper provides a clear view of one area of this research field, dealing mainly with social networks and smartphones. Additionally, we also highlight how data derived from Psychoinformatics can be in a meaningful way with data from human by neuroscience. We close the paper with some observations of areas for future research and problems that require consideration within this new discipline.

KEYWORDS:

Psycoinformatics, humans, computer, researchers, neuroscience.

INTRODUCTION

Current Research Methods in Psychology. Computer science is to have a greater impact on psychology. experiments and questions, it establishes a third fundamental research technique which is the observation of human-device interaction on a very large scale. It allows psychologists to analyse many factors such as personality traits (example: extra version versus and introversion), aptitudes (example: cognitive aging process), as well as behaviour (example driving and lifestyle)Tracking hundreds of thousands of users, the resulting Big Data needs substantial modelling and cleaning. Moreover, its sheer size in combination with machine learning techniques leverages statistical power (we refer to problems with false positives later on).it avoids most sources of bias, because the behaviour of interest is directly recorded. Many biases are inherent to standard psychological

measures, for example, the tendency to respond to self-report measures in a socially desirable way or genuine problems in answering some questions like “How many hours do you typically spend on your gadgets? The approach introduced by Psycho informatics also poses various challenges to the two sciences involved. Most importantly, the two must learn to cooperate and ultimately shape an entirely new disciplined method, Psycho informatics Yarkoni describes Psycho informatics as an emerging discipline that uses tools and techniques from the computer and information sciences to improve the acquisition, organization, and synthesis of psychological data. Traditionally, the psychological science on two fundamental methods of data collection: experiments and interviews. Later the broader behaviour of a person by means of self-report questionnaire or (potentially structured) interviews . These methods suffer many shortcomings. Experiments are reduced to a single data point which is one experiment. considering a small number of users (who must be willing to participate) Clearly longitudinal experiments also exist, though these are conducted less due to the high cost and effort involved. Self-report query’s and interviews also create problems, since we humans find it very tough to recollect past events, they are additionally subject to various sources of bias (example: the social desirability; social desirability refers to the human bias toward presenting oneself in a manner deemed “appropriate” given certain requests or societal norms).likewise modern computer science introduces entirely new methods of assessing participants’ behaviour longitudinally, on large scale, and in comparison to self-reports, in a rather objective manner. Computer science is largely concerned with implementing algorithms using computers or same devices, For the purpose of this paper, we refer to how algorithms can be used on cell phones to analyse “Big Data. “Also, the aim is to highlight some potential avenues of exploitation of data that were derived from digital technologies that are available today.

A SHORT REVIEW OF THE FIRST STUDIES IN PSYCOINFORMATICS

The work that falls within the aspects of the Psychoinformatics is quite scattered. It is first published in two separate scientific communities (psychology and computer science). Secondly these are again segmented in various subcommunities (and different journals), which are not that much aware of one another’s findings. In general, researchers employ a range of techniques on a variety of data sets, using orthogonal methodologies and pursuing a broad set of researching goals

Recently there are plenty of studies that have been conducted, which broadly fit in the category of Psychoinformatics. The term itself has been uniquely coined by several workgroups. These studies mainly deal with data sources to the World Wide Web(WWW), as social networks. They provide a brief review of studies predicting psychological variables from online social networks, such as Instagram or communication channels, such as Twitter.

PSYCHO(NEURO) INFORMATICS

Combining Neuroscientific Data with Data from Psychoinformatics. We have talked for the enhancement of “traditional” psychological data collection by introducing methods from Psychoinformatics. This view should be extended to neuroscience, because of the increasing number of psychologists, who also work in the field of neuroscience. Researchers like them aim to understand the links between cognition, motivation, and emotion with brain structure and function (and its underlying biochemistry). In recent days, many research has done to establish links between personality and human brain structure, with heterogenous outcomes. This is also true for molecular genetics. In both, problems in replicating results can be connected to differences in pre-processing of imaging data (example: MRI), ethnic differences of the participants (both), having differences in sample sizes, and of course different self-report used for individual differences in certain personality related exactly a central challenge lies in achieving a sufficient sample size.

To eradicate these problems, let us consider a number of examples Trying to understand how human brain gives the individual differences in trait anxiety , researchers must choose from the exact neuroscientific tools, also from an arsenal of self-report inventories. But the sad thing is, many of these self-report measures are only modestly correlated and because of this the outcome of the research will be highly dependent on the chosen measure of anxiety. Instead of depending exclusively on self-report data, it will be more efficient to observe anxiety from human-machine interaction example: link this “real” recorded behaviour with variables from neuroscience. The problems of self-report inventories could be significantly reduced by combining observed behaviour from Psychoinformatics with neuroscientific data. By using these methods, real behaviour in one study can be compared with real behaviour in another study. This gives us better replication of results, as the same dependent variables are examined. For example, the study by Kern et al Reported that people with high scores on measures of neuroticism tend to use words such as “sick of,” “depression,” “alone,” or “lonely” more frequently on social networks. Thus, quantifying the use of such words in different communications channels by means of text mining would produce an interesting variable to be combined with neuroscientific data. Moreover, personality traits should be reasonably stable across all kinds of different behaviours and diverse situations in everyday life (please see information on the personality paradox by Mischel and Shoda,they describe how stability of personality must be established across different contexts, example: a boy behaves in a stable way when he's being around girls but not shy when he is with a male or his friends (peers) so anxiety may also be come in the way we drive cars or our communication patterns via e-mail. Accurately tracking and use of this data (and for many scientific purposes) poses great ethical challenges,