Deliverable D1.1: RECOGNITION Internal project workshop to educate consortium on cross-discipline issues.

Version: 1.0
Delivery date: 30th April 2011
Keywords: Project internal workshop, cognitive psychology
Workpackage: WP1 Cognitive models and relevance theory for awareness and learning
Editor: Universita’ degli studi di Firenze (UNIFI)
Contributing partners:
- Consiglio Nazionale delle Ricerche (CNR)
- University of Cambridge (UCAM)
- Institut Eurecom (EUR)
- National and Kapodistrian University of Athens (NKUA)
- Cardiff University (CU)
- Universita’ degli studi di Firenze (UNIFI)

Abstract:
This deliverable reports on dedicated RECOGNITION internal project workshop involving experts of the cognitive psychology field to bring knowledge about foundational models and latest results into the project. In particular, a workshop will be organised to explain the most relevant cognitive theory to project members.

RECOGNITION (grant number 257756) is a project funded by the European Commission within the 7th Framework Programme (FP7) THEME FP7-ICT-2009-5 as part of the FET Pervasive Adaptation (PERADA) initiative.
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Executive summary

This deliverable reports on two workshops held by RECOGNITION partners.

Section 1 presents the details of the internal RECOGNITION Workshop involving experts of the cognitive psychology held on 12th April 2011 at the Cardiff School of Computer Science and Informatics.

Section 2 presents the details of the Human Virtual Dynamics Workshop held on 25th May 2011 in the Department of Psychology at the University of Florence.
1 Introduction
RECOGNITION partners held two workshops during April/May 2011 to allow partners opportunity to discuss RECOGNITION concepts with psychologists and other experts. These workshops were intended to provide an arena for discussion of psychological concepts relevant to the project and to educate the consortium on cross-discipline issues. The initial workshop at Cardiff University was held to facilitate discussion between all partners on the cross discipline issues and psychological concepts that had been identified as possibly useful within the RECOGNITION project. The second workshop at the University of Florence was held to allow local project partners to follow up on these ideas and concepts.
2 Recognition Workshop, Cardiff University School of Computer Science and Informatics.

2.1 Introduction

The RECOGNITION workshop was held at Cardiff University School of Computer Science & Informatics on the 12th April 2011. Representatives attended the workshop from all RECOGNITION partners, and were joined by the presenting speakers and interested researchers and PhD students from the School of Computer Science & Informatics, Cardiff University. In total 25 people attended the workshop during the day.

The purpose of the workshop was to educate the consortium on the cross-discipline issues found within the project and to facilitate discussion on the psychological concepts that may be used within the project. Speakers were chosen from across the field to provide talks on issues that had already been identified by project partners in discussions at previous project meetings or that may prove relevant or stimulate discussion and ideas for further exploration within the project. The format allowed for short presentations from each invited speaker, followed by time for questions, answers and discussion between the speakers and attendees. The presentation sessions were followed up with breakout discussion sessions to allow partners and speakers more discussion time. A full agenda for the day is given in Appendix A.

Videos of the workshop presentations were made available to all project partners on the project website.

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1 www.recognition-project.eu
2.2 Workshop Summary
This section presents a summary of the individual contributions given by the invited speakers from cognitive psychology related areas that attended the Recognition workshop at Cardiff University.

2.2.1 On the relation between sample size and decision quality
Dr Marc Bühner, School of Psychology, Cardiff University.
Marc Bühner is a Senior Lecturer in the School of Psychology at Cardiff University. His current research interests cover casual reasoning and how time affects casual induction within human cognition. His research also covers attitudes & values, and social identity, as well as the areas of judgement and perception.

Abstract
There has been a flurry of psychological research in the last decade on the idea that ‘less is more’: under certain circumstances, the argument goes, decision makers might make better decisions if they have less information at their disposal than if they consider a richer database (Kareev, 2000;2005; Fiedler & Kareev, 2006). Critically, these claims are about the informational value of the sample and not about interference through fatigue or memory limitations. The central argument is that smaller samples tend to have more extreme data distributions and thus yield more clarity when making a choice. I shall argue that there is no psychological or statistical reality in these claims. More specifically, I will show that small samples do not produce clear data, but that instead the causal relation goes in the opposite direction: A rational decision maker may elect to take a small sample if data are clear. This is an important distinction because it can influences guidelines of optimal decision making as well as realistic and optimal algorithms of choice making.

Summary
Traditionally, the view has been held that by increasing the sample size of an experiment, the sample mean will converge to the population mean, that is larger samples provide better results. It has been shown that people obey this ‘Law of Large Numbers’, making more confident choices when larger evidence samples are provided (Griffin & Tversky 1992). While there may be cases where small samples outperform
large ones, where memory, fatigue, cost opportunity and time have affected the decision-making, is there any evidence that there may be an advantage to small samples on purely statistical grounds. Some studies (Fiedler & Kareev, 2006) suggest that this may be the case, under certain circumstances small samples may provide clearer data than large ones. The suggestion is that when the threshold for making a decision is high, a small sample will provide clearer data. People learn this over time, and so get better at optimal sampling, so called ‘adaptive learning’. However, Evans & Bühner (2006) refute this, arguing that clear data implies a smaller sample is needed, while less clear data requires larger samples in order to make confident decisions. So, if a decision is clear initially, there is no need to continue sampling, while if a decision is unclear sampling continues to get a better idea. There is also a correlation between sample size and decision quality: large samples generally provide better decisions. However, the ability to gain extra clarity from extra samples may degrade over time due to boredom or memory fatigue. So, small clear samples are correct, but ambiguous samples gain increasingly less as sample size increases. Humans are found to have a dynamic decision threshold, so that as more data is given the threshold for decisions decreases. The conclusions from the study are that if time, cost, fatigue etc are not considered then small samples are never more informative than large ones. Small samples are themselves contained within larger samples, so the decision maker can ‘throw away’ extra data to obtain smaller samples. A rational sampling choice takes strength and reliability into account, and a dynamic decision threshold allows you to achieve optimal performance.

**Key points for RECOGNITION**

The ‘less is more’ heuristic may be applicable within the RECOGNITION domain but there are caveats that need to be applied to its use.

If larger samples of information can be used in decision-making then they should be as they lead to better results.

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**2.2.2 Person X Environment Interactions in the Wild: Bridging the Social, Behavioural and Computer Sciences**

Dr Jason Rentfrow, University of Cambridge
Jason Rentfrow is a University Lecturer and Fellow of Fitzwilliam College at the University of Cambridge. His research examines the links between basic psychological characteristics and common social psychological processes.

Abstract
Psychologists have long been interested in understanding person X environment interactions, or the interchange between people and their environments. Why do people do what they do? How do psychological processes affect behaviour? And how does the environment affect behaviour? To address such questions, researchers have relied on a limited number of research methods. The vast majority of what we know about the links between psychology and behaviour is based on how university students complete surveys. Very little research actually examines behaviour in the wild. Fortunately, however, recent technological advances have made it possible to explore person X environment interactions using more diverse and representative samples, at multiple levels of analysis, and in the real world. The aim of the presentation is to highlight overlap between the social, behaviour, and computer sciences and suggest ways in which the disciplines might inform each other. Toward that end, the presentation will provide a brief historical overview of theory and research in personality psychology and present findings from research using new methods to study person X environment interactions in the wild.

Summary
Previously, understanding the determinants of behaviour have relied on techniques such as understanding unconscious urges and motives, or Rorschach tests, followed by the science of behaviourism and attempts to describe behaviour empirically while ignoring subconscious, as they aren’t measurable. Recently, this understanding has moved on to the science of personality, leading to the development of the 5 factor model. This began with a lexical analysis of the language used to describe human personality, leading to 7000-8000 personality traits, which have been distilled to 5 main categories. The five-factor model separates personality into the 5 categories: Openness, Conscientiousness, Extraversion, Agreeableness and Neuroticism. Standard personality tests can be used to discover how individuals fit into the personality model, using self-reported answers to questions. This creates some issues when analysing personality related to the honesty of the individuals taking the test and
the understanding they have of the concepts. Work has found that when considering person-environment interactions, individuals create social and physical environments that reinforce and reflect aspects of their psychological qualities, and may do this in one of three ways: Selection: individuals choose certain environments and avoid others, Evocation: individuals unintentionally elicit responses from the environment, and Manipulation: individuals alter their environments to fit their needs. Several studies have been carried out linking personality to different aspects of individuals lives, considering music preferences, emotion, and social networking usage. Correlations have been found between music preferences and personality type (Rentfrow 2011), some emotion expressions and personality type, and even between geographic location and personality type (Rentfrow 2010).

**Key points for RECOGNITION**

The “five-factor personality model” is a widely accepted model for understanding and classifying human behaviour.

Work exists to collect and classify personality traits and correlate these with aspects of human cognition.

### 2.2.3 The Personality of Popular Facebook Users

Dr Daniele Quercia, University of Cambridge

Daniele Quercia is a researcher at the University of Cambridge. His research interests include computational social science, web science and social computing.

**Abstract**

Social science is about studying how (macro) behaviour emerges from a large number of (micro) interactions be-tween individuals. The problem is that those interactions are hard to measure, especially at scale. Since psychological studies on personality have suffered from the same problem, we have analysed data from a highly-popular Facebook application that is able to survey a very large number of Facebook users with peer-reviewed personality tests. Based on test results, we study the relationship between sociometric popularity (number of Facebook contacts) and personality traits, the first of its kind on a large number of subjects. We test to which extent two prevalent viewpoints hold. That is, sociometrically popular Facebook users (those with many social contacts) are the ones whose personality traits either predict many
offline (real world) friends or predict propensity to maintain superficial relationships. We find that the strongest predictor for number of friends in the real world (Extraversion) is also the strongest predictor for number of Facebook contacts. We then verify a widely held conjecture that has been put forward by literary intellectuals and scientists alike but has not been tested: people who have many social contacts on Facebook are the ones who are able to adapt themselves to new forms of communication, present themselves in likable ways, and have propensity to maintain superficial relationships. We show that there is no statistical evidence to support such a conjecture.

Summary
Three important points to consider when designing social media: Geography, Privacy and Personality. When considering geography it is important to realise that when recommending places *geographically close* is a bad strategy for recommending places; users choose people to meet with, not just nearby locations. Privacy has many implications. Location data for individuals needs to be aggregated to remove individual location data. When ascertaining individual location the answer can be randomised to provide somewhat precise location data that does not reveal total user information (Quercia 2010, 2011). Another candidate solution is to give users control over the sharing of information, so they may share everything, share fake data or share nothing at all. Personality may be complicated as the digital representation of a person may not be the same as the real world representation. Studies have shown that there is a correlation between personality and the type of user or number of friendships on a social network. Future work will be focusing on automatically detecting user personality from their digital fingerprint.

Key points for RECOGNITION
Humans may represent themselves differently in the digital world to in the physical world and this must be taken into account.

Location data for humans must be treated sensitively and local recommendations require many inputs.
2.2.4 Sentiment analysis in the Social Web

Prof. Mike Thelwall, University of Wolverhampton, Oxford Internet Institute

Mike Thelwall is Professor of Information Science at the University of Wolverhampton. His research covers developing quantitative web methods from hyperlinks, social networks, blogs and text, web link analysis and web text analysis from an information science perspective (webometrics and cybermetrics), plus sentiment analysis.

Abstract

The rise of the social applications has filled the web with informal content written by citizens in the social web, including Twitter, social networks, and discussion forums. Market researchers and others use this to gauge public reactions to products and advertising. This provides quick, cheap feedback, and, if combined with methods to automatically detect sentiment in text, can help to identify features of particular concern, such as rapid increases in negative feelings towards a product. This talk will describe current methods for automatic sentiment detection in the social web. Such text typically ignores many of the rules of grammar and spelling, undermining the effectiveness of traditional sentiment analysis algorithms, but new algorithms are able to take advantage of deviations from language norms to detect sentiment in new ways. The talk will also illustrate the algorithms with evidence and case studies from Twitter and other social web sites.

Summary

Semantic detection in the social web consists of answering two questions: (i) does the message express an opinion? (ii) if it does, is the opinion negative, objective or positive? These opinions may have an associated value degree indicating how positive or negative they are. The task is made more complex by the use of mixed emotions within messages, having both positive and negative statements within a sentence is completely valid. A further complication when mining sentiment within the social web comes from the length of message: many updates to social networks (for example twitter updates, Facebook statuses) are short in length (Thelwall, 2011). Any sentiment detection system must also be able to cope with poor grammar and the use of non-word emotive indicators such as emoticons or ‘smiley’ (😊). Analysis of
several semantic analysis algorithms has shown accuracy of up to 60.6% for positive sentiment and 73.5% for negative sentiment (Prabowo 2011). A study of sentiment within a social network (Myspace) reveals a level of correlation between the emotions of users and their friends: people tend to use similar but not identical levels of emotion to their friends in messages (Thelwall 2010). A further analysis of video comments on YouTube reveals a correlation between the number of comments left on a video and the positive and negative sentiment strength, a positive correlation between number of comments and negative sentiment strength, and a negative correlation between the number of comments and positive sentiment strength.

**Key points for RECOGNITION**

Sentiment analysis is successfully able to gauge emotion in different social media, from short text micro-blogs to longer text articles or comments.

A correlation exists between sentiment or emotion and social friendships or number of interactions.

### 2.2.5 Map-based Orientation in Urban Environments

Dr David Peebles, University of Huddersfield

David Peebles is a Senior Lecturer in Cognitive Psychology at the University of Huddersfield. His research interests lie in the area of cognitive modelling, specifically in attempting to understand the complex interaction between cognitive, perceptual and motor processes in reasoning and problem solving with external representations of information such as diagrams, computer interfaces and maps.

**Abstract**

I describe two experiments which examined people's strategies when orienting with a map in outdoor scenes within unfamiliar urban environments. The experiments investigated how the 3D visual scene and the 2D layout geometry influenced people's choices of features when matching the scene and the map, and studied the problems they encountered when doing so. The results of the study support previous evidence that in geographically realistic contexts, visible salient landmarks bias people away from using optimal geometry-matching strategies. This implies that prediction of orientation difficulty merely from analysing the spatial layout (e.g., with space syntax...
isovist measures) may be highly problematic. I will conclude by discussing the implications of these results for future map design.

Summary
A study has been carried out examining how humans manage to align maps within the environment, aiming to discover which cognitive processes and strategies are used, which map and environmental cues are used, and which factors influence performance (Davies and Peebles, 2010). The process of working out where on a map a user finds themselves is a complex spatial reasoning task that requires interaction between cognitive and perceptual processes. When carrying out the task, humans use many cues, ground-level cues, 3D object cues, and perceived object distance. Common mistakes made include ignoring the ground level cues and misperceiving the object distance. If both strong 2D cues and 3D landmarks are present the user may be slowed in orientation as they decide which cues to use.

Key points for RECOGNITION
Spatial reasoning is a complex task requiring the use of many different cues for a successful outcome.
2.3 Twitter Participation

During the workshop, participants were invited to tweet their thoughts and comments using the hashtag ‘#RecogWS’ These tweets were collected and displayed in real time in the workshop venue. The display and tweets collected are included below:

![Twitter live display of comments on workshop](image)

**Figure 1 - Twitter live display of comments on workshop**

The display allowed participants in the workshop to follow the online conversation as the workshop progressed by showing the latest tweets about the workshop to the participants and audience. It also allowed the key themes of the workshop to be seen as the workshop developed by utilising a word cloud to pick out the most common words used in the online discussion.

For further details on the twitter participation of the workshop, please see Appendix B
2.4 Analysis, Discussion and Conclusions

Following the workshop presentations, breakout sessions were held consisting of small group discussions between project partners and invited speakers, with conversations revolving around the questions posed by the consortium towards the speakers on topics relevant to the RECOGNITION project. For note transcripts of these sessions, see Appendix C. The purpose of the discussion was to allow project partners to gain further insight into the topics raised by the invited experts, to gain feedback on project ideas and to clarify cross-discipline issues that form part of the RECOGNITION project. The key topics arising in the discussions were as follows:

- **Mood and Emotion**
  - Decisions made by humans are affected by their mood and emotion.
  - The sentiment of a piece of text may cause emotions within humans.
  - Individuals may perceive sentiment differently; this effect may be greater across cultural boundaries.
  - Response to information depends on the richness or extremity of the information.

- **Need for cognition**
  - Humans engage in and enjoy different levels of cognitive activity.
  - The need for cognition forms part of an individual’s personality.
  - Some individuals have a higher propensity to engage in cognitive activities.

- **Personality**
  - Personality type relates to human behaviour, likes, dislikes.
  - The need for cognition may also link to these things and relate to how humans use and participate in social media.

- **Question framing**
  - How a task is approached depends on how it is framed.
  - A positive framing encourages positive behaviour; a negative framing encourages negative behaviour.

- **Social need for similarity**
  - Some individuals feel a need to be similar to friends.

- **Following/Follow relationship**
RECOGNITION

- On twitter the cognitive burden different for each relationship.
- Following many people presents a large cognitive burden, while having many followers is less of a cognitive task.

- **Opinion formation.**
  - Opinions may be influenced, changed or reinforced by contacts within social networks.
3 Human Virtual Dynamics Workshop, Department of Psychology, University of Florence.

3.1 Workshop Introduction

A second workshop (not originally included in the annex) has been organised by UNIFI and CNR partners since the opportunity of presenting the project and the progress made to a team of psychologist has arisen a second time. The purpose of the workshop was that of presenting the RECOGNITION project to the scientific environment in Florence and also to focus the community of psychologists to the role of psychology and cognitive sciences in ICT world.

Psychologists explore concepts such as perception, cognition, attention, emotion, motivation, brain functioning, personality, individual behaviour, sense making, interpersonal relationships and collective behaviours in groups and other structured contextual settings. When viewed in an evolutionary perspective, psychology acquires the sense of the study of a nearly optimized system (the human brain) for social interactions. The increasing knowledge of the working of mind and brain, and the study of social phenomena has opened the study of cognitive modelling that may represent a key topic in many disciplines, such as sociology, epidemics, politics, marketing. An even more interesting application concerns information and computers (ICT world); not only because computer devices are designed for human interaction, but also due to the possibility to exploit knowledge about humans in order to devise new tools and approaches in the ICT field.
3.2 Workshop Summary
This section presents a summary of the individual contributions given by the speakers at the Human Virtual Dynamics workshop at the University of Florence. The agenda for the workshop is given in Section. Videos (in Italian) are available at http://www.complexworld.net.

3.2.1 Mind, computers and society: how the knowledge of psychology may be useful to computer science, and to simulations of societies.
F. Bagnoli

Abstract
Psychology is a composite science of mind and behaviour. In some sense, it may be considered the connection between neuroscience and sociology. Psychologists explore such concepts as perception, cognition, attention, emotion, motivation, brain functioning, personality, behaviour, and interpersonal relationships. When viewed in an evolutionary perspective, psychology acquires the sense of the study of a finely optimized system (the human brain) for social interactions. Traditionally, psychology has a descriptive character for what concerns the motivations, and a quantitative approach to data analysis. The increasing knowledge of the working of mind and brain, and the study of social phenomena has opened the study of social modelling, which may represent a key topic in many disciplines, such as sociology, epidemics, politics, and marketing. But an even more interesting application concerns information and computers (ICT world): not only because computer devices are designed for human interaction, but also for exploiting the knowledge about humans in the ICT field.

3.2.2 VirtHuLab: a new framework to investigate the Human Virtual Dynamics
A. Guazzini

Abstract
Humans are daily asked to take decision based on incomplete and ambiguous information, yet they developed, through centuries of selection, efficient methods and mental structures to face with these tasks. Our goal is that of developing a new framework to studying and modelling this features.
Cognitive psychology is the name of the discipline that investigates how human beings face these problems. These studies do not start from the neural structures, but rather deal with the empirical relationship among "atomic" processes that can be identified into the human behaviour.

Our challenge is to refine a small pool of cognitive theories able to describe those fundamental attributes of humans' cognition which could lead toward an artificial self-awareness. Since 1960, Social cognition and cognitive psychology has developed a coherent approach to the study of human cognition both with theories about its functioning and through the definition of a new taxonomy of concepts and grammars. After the cognitive revolution produced by the works of Neisser in the 1964, Social cognition started to describe mental processes using a new language, able to threat the mathematical structures of the mental processes. The basic concepts of this scaffolding are the cognitive processes and the mental schemes. This two label have inside the cognitive terminology an hard coded definition: while Mental scheme rely on the mental representation (storage/retrieval) of the information, the cognitive processes are those operations that the mind appear to execute on this schemes. Mental Schemes theory (Hastie, Kelley, Zadby, Gerard, Markus) can supply an accurate and implementable description for the information storage/retrieval, while Relevance theory can describe the communications processes among entities, the Social Learning theory (Bandura) can be used to structure the evolution of the cognitive processes, and the definition of data-driven and schema-driven processes (Fiske, Neuberg) can capture the great adaptability and optimization of the mind. Finally cognitive heuristics may inspire those mechanisms acting on the scheme and for the processes, while the Cognitive Economy Principles can be considered for the resource management.

3.2.3 Small Group Dynamics: A Preliminary Results

A. Cini

Abstract

We present a research framework consisting of a standard chat environment and a set of analytical tools, able to detect some relevant characteristics of the group dynamics of interacting people. The analysis is independent of the semantic content of the
exchanged messages, and the standardized interface avoids hard-to-detect non-verbal communications, still providing the expression of emotional contents.

This study proposes a quantitative approach to the investigation of the existing relationship between the individual dimensions, considering the personal cognition about the interaction with the others, and the group dimension, through its dynamical evolution. The subsequent analysis, mixing social network theory and concepts from social and opinion dynamics, allows us to quantitatively investigate how people shape their social space in virtual interactions, exploring the role of topology and the structure of the group evolution. Finally, we present a regression model to explain how the virtual social space is represented by the individuals in interactions with a group.

### 3.2.4 Cognitive Complex Networks: from simple definitions to community detection

E. Massaro

**Abstract**

Detecting communities is a task of great importance in many disciplines, namely sociology, biology and computer science, where systems are often represented as graphs. Community detection is linked to clustering of data: many clustering methods establish links among representative points that are nearer than a given threshold, and then proceed in identifying communities on the resulting graphs. We want to explore the behaviour of exploratory methods inspired by human heuristics, in the hope of exploiting the “social knowledge” of human mind and also for developing more "natural" human-computer interfaces. Clearly, we do not pretend to simulate the real human behaviour, but only to study the behaviour of simplified models inspired by it. In particular, we deal with the task of identifying communities in an existing graphs, using a local algorithm and not relying on global quantities like betweenness, centrality, etc. An individual is simply modelled as a memory and a set of connections to other individuals. We explore two different approaches: in the first, information about neighbouring nodes if propagated and elaborated locally, but the connections do not change. In the second approach, information is not elaborated while it is the wiring that is varied with the result of directly connecting to a central node”. Both processes can be considered implementations of the availability heuristic, which is
simply the assumption that the most vivid or easily recallable information give an accurate estimate of the frequency of the related event in the population.
### 3.3 Workshop Participants

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<td>ISC CNR Florence</td>
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<td>Dept. Physics, University of Bologna</td>
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3.4 Workshop Agenda

11:00 Opening – Prof. Cristina Stefanile, Director of the Department of Psychology

11:30 Complex Systems: Research and Education - Prof. Stefano Ruffo, Center for The study of Complex Dynamics (CSDC)

12:00 Mind, computers and society - Prof. Franco Bagnoli, Center for The study of Complex Dynamics (CSDC)

12:30 ICT and Cognitive Sciences - Prof. Marco Conti, Institute for Informatics and Telematics (IIT), National Research Council (CNR)

14:00 VirtHuLab: a new framework to investigate the Human Virtual Dynamics - Andrea Guazzini, Institute for Informatics and Telematics (IIT), National Research Council (CNR)

14:30 A Small Group Dynamics Experiment: Preliminary Results - Dr Alessandro Cini, Center for The study of Complex Dynamics (CSDC)

15:00 Cognitive Complex Networks: from simple definitions to community detection - Dr Emanuele Massaro, Center for The study of Complex Dynamics (CSDC)

16:00 Round table: psychology and computer science.
3.5 Round table

After the workshop, participants participated in a round table discussion. The topic of discussion was that of focussing on the role of psychology in modern ICT science, and also to gather impressions and stimuli from the psychologist community in Florence.

The main points touched in the discussion were:

- The role of narration in the personal communication, and in particular the autobiographic components (how people see themselves). Contrast between self-representation and other’s perception. Formation of self-awareness of a community. Traditional methods of measurement (written autobiographies) and possibility of developing “electronic” measurement systems. (Andrea Smorti)

- Psychology of attitudes, how they develop, how they are perceived by others. Processes and function of attitudes. How attitude influences interpersonal communication. (Cristina Stefanile)

- Factorial analysis: hierarchies of weights. One-dimensional vs. multi-dimensional analysis. The difficulties of measuring quantities through questionnaires (influence of order), and the need for new instruments, possibly not based on semantic analysis. The role of professional design of questionnaires. The personality factors. Role of small group dynamics and their observations. (Rosapia Lauro Grotto)

- The pieces of information that can be gathered from the history of past societies. How psychology influenced history and how to distinguish “physical” and economical constraint from the psychological one. (Giuliano Pelfer)

- Role of art and emotion on cognitive processes. (Tessa Marzi)

Key points for RECOGNITION:

- The traditional methods for measuring psychological quantities require “hand work” and personal contacts.

- The design of questionnaires is a complex task and “naive” approaches can give wrong results.
RECOGNITION

- There is a need of establishing new paradigms for measuring psychological quantities in an Internet environment.
- There is a large knowledge base about human behaviour in the psychological field that needs to be analyzed and modelled from a mathematical or computational point of view.
Appendix A - Cardiff Workshop Agenda

RECOGNITION WORKSHOP

12 April 2011 (Room WX 3.11-12, Cardiff School of Computer Science and Informatics)

9:00 - 9:30 Overview and welcome

Roger Whitaker

09:30 -10:20 On the relation between sample size and decision quality

Dr Marc Bühner, School of Psychology, Cardiff University

There has been a flurry of psychological research in the last decade on the idea that ‘less is more’: under certain circumstances, the argument goes, decision makers might make better decisions if they have less information at their disposal than if they consider a richer database (Kareev, 2000;2005; Fiedler & Kareev, 2006). Critically, these claims are about the informational value of the sample and not about interference through fatigue or memory limitations. The central argument is that smaller samples tend to have more extreme data distributions and thus yield more clarity when making a choice. I shall argue that there is no psychological or statistical reality in these claims. More specifically, I will show that small samples do not produce clear data, but that instead the causal relation goes in the opposite direction: A rational decision maker may elect to take a small sample if data are clear. This is an important distinction because it can influences guidelines of optimal decision making as well as realistic and optimal algorithms of choice making.

10:20 – 10:40 Coffee break
10:40 – 11:30 *Person X Environment Interactions in the Wild: Bridging the Social, Behavioural, and Computer Sciences*

Dr Jason Rentfrow, University of Cambridge

Psychologists have long been interested in understanding person X environment interactions, or the interchange between people and their environments. Why do people do what they do? How do psychological processes affect behaviour? And how does the environment affect behaviour? To address such questions, researchers have relied on a limited number of research methods. The vast majority of what we know about the links between psychology and behaviour is based on how university students complete surveys. Very little research actually examines behaviour in the wild. Fortunately, however, recent technological advances have made it possible to explore person X environment interactions using more diverse and representative samples, at multiple levels of analysis, and in the real world. The aim of the presentation is to highlight overlap between the social, behaviour, and computer sciences and suggest ways in which the disciplines might inform each other. Toward that end, the presentation will provide a brief historical overview of theory and research in personality psychology and present findings from research using new methods to study person X environment interactions in the wild.

11:30 – 12:00 *Group discussions: Identification of key cognitive behaviours for (1) Computation & organisation of data; (2) information retrieval; (3) learning.*

12:00 – 12:50 *The Personality of Popular Facebook Users*

Dr Daniele Quercia, University of Cambridge.
Social science is about studying how (macro) behaviour emerges from a large number of (micro) interactions between individuals. The problem is that those interactions are hard to measure, especially at scale. Since psychological studies on personality have suffered from the same problem, we have analyzed data from a highly-popular Facebook application that is able to survey a very large number of Facebook users with peer-reviewed personality tests. Based on test results, we study the relationship between sociometric popularity (number of Facebook contacts) and personality traits, the first of its kind on a large number of subjects. We test to which extent two prevalent viewpoints hold. That is, sociometrically popular Facebook users (those with many social contacts) are the ones whose personality traits either predict many offline (real world) friends or predict propensity to maintain superficial relationships. We find that the strongest predictor for number of friends in the real world (Extraversion) is also the strongest predictor for number of Facebook contacts. We then verify a widely held conjecture that has been put forward by literary intellectuals and scientists alike but has not been tested: people who have many social contacts on Facebook are the ones who are able to adapt themselves to new forms of communication, present themselves in likable ways, and have propensity to maintain superficial relationships. We show that there is no statistical evidence to support such a conjecture.

12:50 – 14:00 Lunch

14:00 – 14:50 Sentiment analysis in the Social Web

Prof. Mike Thelwall, University of Wolverhampton, Oxford Internet Institute.
The rise of the social applications has filled the web with informal content written by citizens in the social web, including Twitter, social networks, and discussion forums. Market researchers and others use this to gauge public reactions to products and advertising. This provides quick, cheap feedback, and, if combined with methods to automatically detect sentiment in text, can help to identify features of particular concern, such as rapid increases in negative feelings towards a product. This talk will describe current methods for automatic sentiment detection in the social web. Such text typically ignores many of the rules of grammar and spelling, undermining the effectiveness of traditional sentiment analysis algorithms, but new algorithms are able to take advantage of deviations from language norms to detect sentiment in new ways. The talk will also illustrate the algorithms with evidence and case studies from Twitter and other social web sites.

14:50 – 15:40 Map-based orientation in urban environments

Dr David Peebles, University of Huddersfield.

I describe two experiments which examined people's strategies when orienting with a map in outdoor scenes within unfamiliar urban environments. The experiments investigated how the 3D visual scene and the 2D layout geometry influenced people's choices of features when matching the scene and the map, and studied the problems they encountered when doing so. The results of the study support previous evidence that in geographically realistic contexts, visible salient landmarks bias people away from using optimal geometry-matching strategies. This implies that prediction of orientation difficulty merely from analysing the spatial layout (e.g., with space syntax isovist measures) may be highly problematic. I will conclude by discussing the implications of these results for future map design.

15:40 – 16:00 Coffee break
16:00 - 16:30 Breakout sessions: small group discussions around questions posed from the consortium with speakers, focussed on (1) evidence of impact of ICT on human behaviour; (2) heuristics; (3) spatial models.

16:30 - 17:00 Panel discussion & conclusions

17:00 Close

19:00 Evening Meal
Appendix B – Cardiff Workshop Twitter Participation

Figure 2 - Wordle of twitter comments from workshop
D1.1 RECOGNITION INTERNAL PROJECT WORKSHOP TO EDUCATE
CONSORTIUM ON CROSS-DISCIPLINE

**walter_colombo**
It seems that major events increase the negativity of tweets #recogws

**voxmjw**
Old rock videos receive the most overwhelmingly positive sentiment on youtube?! #nostalgia #recogws

**danielequercia**
If you are building sentiment analysis algorithms, few useful examples to test http://bit.ly/hQVTHz #recogws

**RecognitionCU**
Are major events on twitter characterised by an increase in negative tweeting? #recogws

**vladtn**
Heuristics for sentiment analysis by @mikethelwall at #recogws : repeated letters and exclamation marks boost sentiment, niiiiice!!!

**walter_colombo**
Current talk at #recogws : detecting mixed feelings with sentiment analysis

**RecognitionCU**
Prof Mike Thelwall - Sentiment Analysis in the Social Web #recogws

**RecognitionCU**
Tracking who talks to whom rather than just colocation #recogws

**RecognitionCU**
Could be many online sources to use to determine personality types #recogws

**martinjc**
Facebook mediates and reduces communication between people #recogws

**voxmjw**
The privacy spectrum: share everything -> ... -> share lies -> ... -> share nothing :).
#recogws

Figure 3 - Sample of twitter comments on workshop
Appendix C – Cardiff Discussion Transcript

The session was split into two discussion groups. Group 1 consisted of two guest speakers, Daniele Quercia (DQ) and Marc Bühner (MB), along with five Recognition project partners, Stuart Allen (SA), Andrea Passarella (AP), Marco Conti (MC) Ioannis Stavrakakis (IS) and Franco Bagnoli (FB), and one PhD student, Matthew Williams (MW). Group 2 consisted of two guest speakers, Mike Thelwall (MT) and David Peebles (DP), two project partners, Roger Whitaker (RW) and Chris Jones (CJ) and four project researchers, Eric Blass (EB), Viet Nguyen (VA), Martin Chorley (MC) and Walter Colombo (WC).

Group 1 Discussion

Daniele Quercia (DQ), Marc Bühner (MB), Stuart Allen (SA), Andrea Passarella (AP), Marco Conti (MC) Ioannis Stavrakakis (IS), Franco Bagnoli (FB), Matthew Williams (MW).

SA:
Twitter -- little intrinsic value to the information you're getting. How does one decide which items of information are going to affect people? Does personality play at all with this?

DQ:
A person's mood can affect their response to information, and also the information they provide when queried. Can be tested by priming the subject beforehand and then asking him/her for information.

MB:
"Compatibility effects in decision making" The manner in which tasks are framed greatly affects how the subject behaves. Example: a subject is given 10 options and must choose three to pass on. Task can be framed in one of two ways:
1) "eliminate seven of these options" (typically causes the subject to filter by looking for negative qualities)
2) "keep three of these options" (typically the opposite -- subject tries to find positive qualities)

SA: Boredom and information -- what makes things bland to different people?
MB: Some factors are: richness of information, number of features, extremity.

SA: Can it be related to personality? (As music can be related to personality.)
DQ: lastfm study on diversity of listening. Some people like few genres. Other people like a variety of genres. Songs liked by everyone are usually the popular ones. A popular song is listened to by many (various) people There are artists that unite people:

artists that are globally popular

and

artists that are popular in a restricted geography (i.e., within a specific country).

SA & DQ: lastfm -- do people want to conform or do they want to be different? Many people feel a social need to be similar to friends.

DQ: health foods for children study (BBC?)

SA: People may use listening preferences to define their identity.
MB: There is a lot of research about national identity (esp. Welsh identity); this may be relevant.

DQ: Political news and diversity on twitter. Recent Jon Crowcroft paper. Twitter allows people from the left to read right-wing news. Twitter helps expose people to different points of view.
MB: What is the effect of this? Does it make people more moderate or more extreme?
DQ: People trust content based on its source. E.g., Democrats will agree with Democrats. Also other work (Cass Sunstein, Harvard) shows that if all members of a jury have similar opinions, then their beliefs become more emphatic.
DQ: It is likely that individuals with high openness are those that seek out diverse information (may be similar for music tastes). It may also be that those with high openness may pass on diverse information to their acquaintances (e.g., twitter follows).

MB:
"Actively open-minded thinking" There are people with a higher propensity to engage on a cognitive level. People who typically enjoy cognitive tasks (puzzles, etc.)

DQ: "cognitive words". Following (many) people on twitter is a cognitive burden. But tweeting and having many follows is less burdensome (these people use cognitive words less often). It's easier to speak than to listen.

DQ & SA: It may be that those who are very quiet on twitter may be better sources of information. Quiet people may only tweet when their interest is especially piqued.

SA & MB:
How do people adjust their views when they find a friend's recommendation (e.g., restaurant) was not good? Other factors involved such as the act of recommending influences the level of expectation.

AP & MB & MC:
(Discussion about fatigue during the sampling task discuss in MB's presentation.) Can one model the resource consumption effect (i.e., fatigue due to many samples) such that we can see that increasing the sample doesn't result in any benefit?

MB:
"episodic memory" The task can be viewed as a "association updating task". Most current models assume path independence, but research shows that humans are not path independent Extreme blocks of samples (e.g., a stream of positives) can have a strong impact on the subject's decision. Also, the instructions given to the subject have a large impact. If the subject is explicitly instructed to aggregate over the whole series, then primacy and recency effects are mitigated. On the other hand, primacy
and recency can be strong for subjects who were not explicitly told to consider the whole stream. The machine learning literature can be useful for material on learning models (but these are typically from a ComSc/Engineering perspective).

**Group 2 Discussion**

Mike Thelwall (MT), David Peebles (DP), Roger Whitaker (RW), Chris Jones (CJ), Eric Blass (EB), Viet Nguyen (VA), Martin Chorley (MC), Walter Colombo (WC).

RW:
Personality traits in relation to sentimental analysis. Understanding who reacts well to some situations and who doesn't

MT:
Sentiment is something expressed in text that may cause emotions. Sentiment is a communication thing. Emotion is a feeling.

RW:
Utility degree easy to do if related to a specific item. Consume small pieces of information that causes emotions even if don't reflect a specific function.

MT:
Linked to sentiment analysis. For different people the word confuse can mean different things

WC:
Different cultures too. A way to adapt sentiment analysis may be: we cannot measure unconscious but we can measure behaviour

MT:
Cognition: women look more for landmarks, but the way the brain works is quite general and cannot go back to personality
RECOGNITION

WC:
Is extraversion the only personality trait that has an effect on online friendship?

MT:
Swearing between friends in twitter can be very common. Twitter more valuable because they come from specific users.

DP:
People re-tweeting more often have expertise in very narrow topics.

WC:
People tweeting about major events are always slightly negative - it is because of the big impact of these things.

EB:
Suggestion only neutral content have importance - I don't want any aggressiveness.

RW:
Personality - profiling individuals through multiple sources.

MC:
Our collection of foursquare checkins. Social networks and attractions between character dispositions.

CJ:
Application – captioning. Making content more self aware - content+meta data

DP:
Personality profiles and social networks. Individual choosing to be on twitter infer different attitudes and behaviours.
Appendix D - Florence Workshop Poster

**Centre for the Study of Complex Dynamics**

**Human Virtual Dynamics**

A new research center to develop psychological insights for the future Internet

25 May 2011

Department of Psychology, University of Florence

**Introduction**

Psychologists explore concepts as perception, cognition, attention, emotion, motivation, brain functioning, personality, individual behavior, sense making, interpersonal relationships, and collective behaviors in groups and other structured contextual settings. When viewed in an evolutionary perspective, psychology acquires the essence of the study of a finely optimized system (the human brain) by social interactions. The increasing knowledge of the workings of mind and brain, and the study of social phenomena has opened the study of cognitive modeling, that may represent a key link in many disciplines, such as sociology, epidemics, policies, marketing. But an even more interesting application concerns information and computers (ICT) worlds not only because computer devices are designed for human interaction, but also because the possibility to exploit knowledge about humans in order to devise new tools and approaches in the ICT field.

**PROGRAMME**

10:30 **Registration and Welcome Coffee**

11:00 **Opening Remarks by the Director of the Department of Psychology, University of Florence**

**PROF. DA CRISTINA STEFANILE**

11:30 **Simple Systems: Education and Research**

**STEFANO RUFO**

12:00 **Mind, computer and society: how the knowledge of psychology may be useful to computer science, and to simulations of society**

**FRANCO Bagnoli**

12:30 **The Role of Human Sciences in the Future Internet design**

**Marco Conti**

13:00 **Light Lunch**

14:00 **VirtualLab a new framework to investigate the Human Virtual Dynamics**

**Andrea Guazzini**

14:30 **A Small Group Dynamics Experiment: preliminary results**

**Alessandro Cini**

15:00 **Cognitive Complex Networks: from simple definitions to community detection**

**Emanuele Massaro**

15:30 **Coffee Break**

15:50 **Round Table**

**Moderator: Rosapia Lauro Grotto**

17:30 **Conclusion**

Contact: csdc@complexworld.net - http://virtuhub.complexworld.net

**Recognition**

Reference and permission by the European Commission on human-exchangeable data.
Appendix E – Florence Workshop Feedback

Participants were asked to complete a questionnaire about the workshop. This section presents the summary of the received 13 responses.

Legend:
Molto insufficiente: very insufficient
Insufficiente: insufficient
Sufficiente: sufficient
Buono: good
Ottimo: excellent

Global evaluation

Morning evaluation

Afternoon evaluation
Clarity of goals

Clarity of exposition

Content novelty
Relevance for own research

Logistic - room

Logistic - audio
D1.1 RECOGNITION INTERNAL PROJECT WORKSHOP TO EDUCATE CONSORTIUM ON CROSS-DISCIPLINE

Logistic - catering

Logistic – structure of day

Logistic - advertizing
molto insufficiente 0 0%
insufficiente 0 0%
sufficiente 7 54%
buono 5 38%
ottimo 1 8%

Logistic - involvement

molto insufficiente 0 0%
insufficiente 0 0%
sufficiente 1 8%
buono 9 69%
ottimo 3 23%

Logistic - planning

molto insufficiente 0 0%
insufficiente 1 8%
sufficiente 0 0%
buono 10 77%
ottimo 2 15%

Site virthulab.complexworld.net
Video recording

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