EBICC 2015 Accepted Papers and Posters with Abstracts

Wesley Becari, Gabriel Durante, Henrique Estanislau Maldonado Peres and Francisco Javier Ramirez-Fernandez.

Application of Support Vector Machines for adulteration detection of bovine milk

Abstract: Milk production is among the main Brazilian food sectors, with a total production about 35 billion liters in 2014. However, the supervision of the quality of those products does not keep pace with the sector production growth, which facilitates frauds. Furthermore, current technologies that check adulteration in milk are primarily chemical-analytical, performed in laboratory environment [1]. Thus, milk analysis and classification is an important way to prevent frauds. This work proposes a detection methodology of bovine milk adulteration applying Support Vector Machines (SVM) classifiers. SVM are a set of supervised learning methods used for classification, regression, recognition and prediction [2]. Through SVM it is possible to obtain higher classification accuracy and robust models [3] [4]. Three samples of brazilian cow milk were analyzed: raw milk, UHT (Ultra High Temperature) brand Ninho and UHT brand Paulista. These samples were diluted with different proportions of usual milk adulterants such as water, hydrogen peroxide, sodium hydroxide and formaldehyde. Then, the samples were characterized by measurements of its electric impedance, pH, temperature and by the Time Domain Reflectometry (TDR) technique. Classification was performed with a 5-fold validation set, each fold with approximately 59 data obtained from the sensors. Linear and non-linear SVMs were trained with different kernels. The best results were obtained with a simple linear SVM that allowed qualifying milk samples as "unadulterated" or "adulterated". The overall percentage of correct answers (overall accuracy) was 94.9%. Therefore, the proposed methodology is useful for classifying milk, enabling the possibilities of local and real-time monitoring systems for fraud detection in milk composition.

Vinicius Fernandes, João Sato, Lucas Trambaiolli, Renato Anghinah and André Fonseca.

Analysis Of Sample Entropy During A Resting-State Eeg Recording In Alzheimer's Disease

Abstract: Objective: Our study aimed to analyze the electroencephalogram (EEG) at rest in subjects with probable AD to test the hypothesis that regularity is higher in these subjects than in age-matched controls. Method: We recorded EEG from 34 subjects, 22 with probable AD, and 12 normal elderly. We applied spectral analysis to test whether the data present a typical activity signature (reported in literature) and then we correlated the results with sample entropy. Results: Spectral analysis was able to detect differences between the control subjects and Alzheimer's subjects; there was a decrease in the spectral power of high frequencies and an increase in slow frequencies throughout the cortex, a finding which is characteristic of the phenomenon known as waves' slowdown. By comparing the sample entropy taken from both AD subjects and healthy adults, we observed more regularity in the EEG signal from the Alzheimer's group at rest. Conclusions: The sample entropy results complemented the findings obtained using spectral analysis, an increased regularity may also be caused by the slowdown phenomenon, due to the death of cholinergic neurons. Nonlinear analysis of EEG might provide valuable information contributing to a wider view on brain dynamics in AD, which are not observable using conventional methodologies.

André Bazzoni.

Logical and Philosophical Foundations of Partial Belief Models

Abstract: This paper is an attempt to put forward a new kind of partial model for representing belief states. I first introduce some philosophical motivations for working with partial models. Then, I present the standard (total) model proposed by Hintikka, and the partial models studied by Humberstone and Holliday. I then show how to reduce Hintikka's semantics in order to obtain a partial model which, however, differs from Humberstone's and Holliday's. I finally discuss the nature of such differences, and provide motivations for using the former rather than the latter.

Lucy Mari Tabuti, Ricardo Nakamura and Ricardo Luis De Azevedo Da Rocha.

Análise das competências e habilidades de raciocínio lógico em um jogo de lógica nos meios físico e digital

Abstract: The progress of technology and its access to a large number of people, especially in mobile devices, make digital games a very popular tool, also in academic environment. Although, for digital games – mainly those of logic – to have acceptable quality in education, they must be developed in a way that skills and competences of traditional games are kept in the digital environment. This article presents a study of skills and competences of logical reasoning in a logic game both in traditional and in digital environment. The study shows that most of skills and competences of logical reasoning when developed in traditional environment are preserved in digital environment.

Beatriz Sorrentino Marques.

Presuppositions about the role of consciousness in the Agent Causation conception of agents and the problem of the Disappearing Agent

Abstract: Well-known Agent Causation theories rely on a certain conception of agency that leads to the expectation that agents play a role in the production of their action, a conscious role. According to this conception of agents, the requirement about consciousness is the ground for these theories to pose the objection of the Disappearing Agent to the Causal Theory of Action. I will argue that, in a similar way, Daniel Wegner defends the idea that consciousness is a defining mark of agency. However, Wegner is not an Agent Causationist; in this sense, he is viewed here as posing a modern version of the view that consciousness is a requirement for agency, and of the view that without consciousness playing a part in the production of action the role for the agent would be lacking in this production. I will argued that the objection of the Disappearing Agent raised by Agent Causation theories also equates lack of consciousness with lack of agential role in the production of action. This will show that the issue is grounded on a specific conception of what an agent is and what her role in producing actions should be; so, in this sense, the elements that ground the Disappearing Agent objection resemble Wegner's view. I, however, defend the claim that this conception of agency should be revised, as well as the problem of the Disappearing Agent, because human agents cannot fulfill the requirements in question.

Charles Borges.

Brain-Body-Life: Towards a panpsychist theory of embodied cognition

Abstract: This paper develops a Panpsychist theory of embodied cognition. As a monist theory, its aim is to present a non-reductive Materialist ontology of mind as an alternative to Dualist conceptions of mind and cognition (Substance Dualism and Propriety Dualism) regarding the mind-body and the mind-mind problems.

Zhengmao Ye, Habib Mohamadian, Hang Yin and Yongmao Ye.

Integration of Fuzzy C-Means Clustering and Fast Level Set for Aerial RGB Image Segmentation

Abstract: The fuzzy level set method is proposed for aerial object recognition with respect to three RGB color components independently. Seeing that the convergence rate and robustness of the fuzzy level set are both sensitive to initialization, fuzzy C-Means clustering is employed for pixel classification in spatial initialization and parameter configuration. The level set model is then introduced to deploy active contours and formulate dynamic boundaries. This approach has been implemented on multiple sets of aerial RGB images such as sparse-distributed and dense-distributed images. Based on numerical simulation, rapid and distinct recognition of targeting objects in all four typical cases are observed in each aspect of primary color representation, with the presence of intensity inhomogeneity in aerial images.

Leonardo S Barbosa and Sid Kouider.

Repetition Probability Modulates Repetition Suppression without Perceptual Awareness

Abstract: Neural activity induced by a visual stimulus is usually reduced when it is repeated. This phenomenon, termed repetition suppression (RS), is classically held to stem from neuronal adaptation either as a consequence of bottom-up adaptations (Grill-Spector et al., 2006; Gotts et al. 2012). More recently, however, RS has been argued to derive from top-down mechanisms of predictive coding, reflecting a comparison between the expected and actual sensory evidence conveyed by the stimulus (Rao & Ballard 1999; Friston 2005; Summerfield et al., 2008). Congruent with this view, RS has been shown to increase with the probability of encountering a repeated stimulus (Summerfield et al., 2008, 2011; Todorovic et. al, 2011). Nevertheless, this assumption has been challenged by a surge of recent studies arguing that this modulation of RS is restricted to a certain class of prior expectations (Kovacs et al., 2013; Larson & Smith, 2012), casting doubt as to which extent top-down mechanisms are necessary to explain RS, otherwise saying, questioning the automaticity in forming and applying prior information to sensory evidence. Here, to address this issue, we used a subliminal priming paradigm combined with EEG recordings (Henson et al., 2008). Moreover, we varied the probability of repetition between experimental blocks in order to address whether unconscious RS can be modulated by the predictive context (i.e. repetition probability). Our results show that invisible stimuli evoke RS at early stages of EEG in electrodes close to perceptual regions. Crucially, RS was present only when a repetition was expected, and vanished when an alternation was expected, independently of consciously perceiving the prime. We argue that this provides evidence for automatic, unconscious influence of probabilistic context in RS, affecting early perceptual components.

Denis James Pereira and Leonardo Lana De Carvalho.

A modelagem multiagente como metodologia de estudos de fenômenos sociais

Abstract: Este trabalho apresenta um breve panorama histórico sobre a conceitualização das Ciências Humanas e Sociais e uma discussão acerca de novas metodologias que utilizam plataformas computacionais multiagente para o estudo de fenômenos sociais, influenciadas pela abordagem Enativa em Ciências Cognitivas. Para a conceitualização desta pesquisa, selecionamos autores consagrados da fundamentação das Ciências Humanas e Sociais e do Enativismo, e em especial pesquisadores da modelagem multiagente para estudo dos fenômenos sociais. Wilhelm Dilthey um dos principais expoentes de uma proposta de Ciências Humanas e Sociais é retomado e suas considerações são apresentadas. O sociólogo Max Weber e, mais recentemente, o antropólogo Roberto da Matta também oferecem conteúdos importantes ao debate. No entanto, defendemos que o desenvolvimento da abordagem Enativa das Ciências Cognitivas, dos autores Humberto Maturana e Francisco Varela, abre novas possibilidades para os estudos dos fenômenos humanos e sociais. As conceitualizações do enativismo extrapola a área inicial de estudos, dentro da Biologia, para renovar paradigmas nas diversas áreas do conhecimento. Plataformas para o estudo de fenômenos sociais, por exemplo, são influenciados pelo enativismo e contribuem para aumentar as possibilidades em ciências humanas e sociais. Como importante marco da modelagem computacional em ciências humanas e sociais o Modelo de Segreção Racial de Schelling é discutido, assim como são considerados para este trabalho outros pesquisadores como Nigel Gilbert, Jacques Ferber e Robert Axtell. Em conclusão, reafirmamos que a abordagem Enativa em Ciências Cognitivas influencia diversas áreas do conhecimento sem violar a autonomia de diferentes disciplinas como por exemplo a sociologia, biologia, psicologia ou linguística. Mas fornece uma coerência interdisciplinar sem reduzi-las umas às outras, fornece uma alteração de paradigma no interior das disciplinas. A modelagem multiagente traz, neste contexto, novas possibilidades aos cientistas para o estudo de fenômenos humanos e sociais por acrescentar uma outra metodologia para suas pesquisas.

Majid Rostami and Mehrnaz Piroozbakht.

A new hybrid training algorithm based on Bird Mating Optimizer (BMO)

Abstract: Bird mating optimizer (BMO) is a novel heuristic optimization method based on the mating ways of bird species for designing optimum searching techniques. It has been proven that this algorithm has good ability to search for the global optimum, but it suffers from slow searching speed in the last iterations. This paper proposes a new hybrid algorithm based on opposition approach and BMO, named Opp-BMO. In this paper a comparison of the performance of BMO and Opp-BMO in feedforward neural networks (FNNs) training is performed, based on the case study of stock price forecasting. It is proven that an FNN trained with Opp-BMO has better accuracy than one trained with BMO.

Daniel Rodrigues, Wesley Becari, Alexandre Neto, Péricles Oliveira, William Silva and Henrique Peres.

Ethanol Fuel Analysis Using Artificial Neural Networks

Abstract: Brazil is a country with a high production of automotive fuel, producing almost 29 billion liters of ethanol in 2014. However, the illegal adulteration of automotive fuel can cause numerous problems: there is the pollution resulting from irregular fuel (burning of adulterated products results in more dangerous pollution); there are health issues (methanol used to adulterate ethanol can cause death in sufficiently large doses); there are mechanical problems (adulterated fuel conduces to reduced engine lifetime); and also economic issues (tax evasion and unfair competition are consequences of adulteration with cheaper and illegal substances). Besides, usual ways of fuel analysis require relatively complex laboratory methodologies and equipment. Hence, this work proposes a classification methodology of ethanol fuel using an Artificial Neural Network (ANN) algorithm embedded in a microcontroller, using the data from four portable sensors, and testing it with water-adulterated ethanol. For analysis, the ANN utilizes a Multilayer Perceptron (MLP) model trained with backpropagation for qualifying ethanol based on four different sensing methods: time-domain reflectometry (TDR), conductivity measurement, infrared absorbance (based on spectroscopy studies), and density measurements (obtained from a pressure sensor). Sixteen samples of ethanol adulterated with various proportions of water were prepared. Nine of them were used for training the ANN (to classify samples between "approved" or "reproved"), while the other ones were used for validation of the system. The results have shown that the system was able to detect a variation of 2 % (volume/volume %) of water in the ethanol samples. Therefore, the proposed methodology can classify ethanol fuel adulteration and can be useful for in situ ethanol fuel qualification.

Mariana Vitti-Rodrigues.

Information and Complexity in the Study of Cognition

Abstract:

The objective of this project is to analyze the relationship between information and cognition, from the perspective of the Theory of Complex Systems. The central research question is: "What is the role of information in abductive reasoning?" Our approach will be to analyze the concept of information, focusing on its semiotic aspects, as defined by Charles S. Peirce (1839-1914), and the notion of abductive reasoning. Three hypotheses will guide the work: H1. Information about objects indicates their characteristics or predicates; H2. The unveiling of information in the context of problem solving is the "fuel" of abductive reasoning and, in turn, of the process of cognition; H3. The Theory of Complex Systems provides relevant conceptual resources for study of the relationship between information and abductive reasoning. In short, we intend to analyze, from the perspective of the Theory of Complex Systems, the role of information in the development of abductive reasoning, which (we hypothesize) sheds lights in the process of cognition.

Marcelo Taddeo and Roberto Ivo Da Rocha Lima Filho.

An Event-Related Analysis Of The Traders Decision-Making By Using ICA

Abstract: The objective of this article is to identify, with the aid of an electroencephalogram (EEG) and by using a multivariate statistical tool called independent component analysis (ICA), the areas of the brain and their interconnection associated to the Traders' decision-making process. In order to assess such activity, a sample of forty (40) experienced traders were used, both divided equally into 50\% male and 50\% female. In Lima Filho (2014), it was found through brain mappings that such traders tend to make decisions by using an associative based rule process instead of any of analytical form, as posed by much of the classical financial literature. METHODOLOGY: Volunteers participated in a simulation of investments on the São Paulo Stock Exchange - BM & FBovespa - whilst electroencephalogram (EEG) epoch was recorded. The total simulation time lasted 50 minutes, also subdivided into 25 minutes, primarily related to a bull market and then a down market. Thus, the purpose was to characterize brain activity patterns associated with the purchase, sell or hold decision of a set of shares comprising two experimental portfolios (called A − Upward Market and B - Downward Market). According to Onton and Makeig (2006), "electrode locations are at best quite crude indicators of the locations of even the strongest underlying cortical sources", resulting into EEG recordings with 'low spatial resolution.' Since we aim to isolate the areas of the brain that were activated, a way of tackling this problem is making use of the Independent Component Analysis (ICA). They decompose the data (input) into a set of components which are independent and explain the data itself and its variability by writing them as a linear combination of such factors. RESULTS: Traders group proved to have a more heterogeneous decisions, given high standard deviation, with even negative values. It is also worth mentioning that the average decision time this group was fast, a total of 49.2 seconds/decision. This may also suggest a time discount regarding the expected reward, as advocated by Muller and Cohen (2001), since the activation of the decision-making process occurred late in the frontal cortex and prefrontal right. Additionally, this indicates an heuristic / associative system domain. The most interesting was the fact that the purchase and sale orders have triggered different neuronal circuits, even in a predictable market, as explained by Rocha (2013).

Roberto Ivo Da Rocha Lima Filho.

Traders' Decision-Making Processes: Results From An Investment Simulation Monitored With An EEG

Abstract: The objective of this article is to identify, with the aid of an electroencephalogram (EEG), that traders use different areas of the brain (and therefore different levels of neuronal activity) in their decision-making process when it comes to making a financial investment. A sample of forty (40) experienced traders was used, divided equally into 50% male and 50% female. Some findings through brain mapping indicate that these operators in the financial market tend to make decisions using an associative based rule process (anchored to historical or intuitive data); rather than any form of analytical based rule, as the classical financial literature on this issue suggests. From an economic standpoint, this work is distinct from the classical theories of Finance - Efficient Markets Theory and Modern Portfolio Theory - to the extent that it not only employs assumptions of behavioural finance, but also encompasses studies of neurocognitive processes.

Marek Vanzura.

What can a drone operators' PTSD tell us about embodied and extended mind?

Abstract: For a long time, academics are discussing ethical aspects of use of unmanned aerial vehicles, also known as "drones" in the warfare, especially the notion of remote killing. However, out of sight is another highly important perspective concerning drones, which is interesting mainly for philosophy of mind and cognitive science. It is the impact of drone use on their very pilots or operators. So far drone operations are not completely autonomous and at least all the important decisions are still made by human operators; in many cases, these men and women control unmanned vehicles almost all the time. So the perspective of what impact have drone operations on their remote pilots is still waiting for its analysis. Luckily, in recent years there emerged first studies, which promise a huge potential for important and interesting research. The starting points for philosophical exploration of this topic are studies on existence of Post-Traumatic Stress Disorder (PTSD) among drone operators. The very existence of this issue among people, who are physically distant from war-zones, is disturbing and so far not sufficiently explained. I am offering a potential explanation. I propose to think about this topic in framework of the extended mind theory. If we use this explanatory framework on drone operators' PTSD problems, we get not only quite satisfying look on what causes this problem with mental health of remote pilots, but we also get a lot of epistemologically relevant consequences. According to the extended mind theory, the PTSD among drone operators is caused by the fact that their minds (and also cognition and even emotions, as I propose) are embodied and extended not only into their biological bodies, but also into external non-biological artifacts, such as ground control station and the remote drone itself. Because of that, their mind is physically exposed to stressful conditions of war-zones and thus, drone operators experience everything almost the same way as pilots sitting in the manned airplanes. Cognitive processes and emotions are embodied and extended as well. This concept explains, why there is a PTSD present among people, who are sitting in safe and air-conditioned cubicles, while all discomfort connected to war is on the other side of the globe. If we accept this view, we will face serious epistemological, as well as ethical consequences. Drones are a picture perfect example of teleoperations, so we can find here a whole group of epistemological (in this case telepistemological) problems concerning acting and acquiring information in distance. First difficulties spring from the skeptical view that we could be deceived. It would be, for example, possible that situations presented via monitors at ground control station are computer-generated simulations that do not mirror reality in any sense, which drone operators do not know. In this case, it would mean that PTSD among operators is caused by non-existent situations, or at least by situations existing in very different and strange ontological sense. In other words, this would mean that mind, cognition and emotions are embodied and extended into computer simulations and potentially into something that does not exist. It seems that it is sufficient as a drone operator to think that I am causally active in a sequence of operations to embody and extend a mind into computer simulation. Ethical perspective on this situation is as follows. If we consider mind as embodied and extended into external artifacts and relationship between internal biological components and external non-biological components as reciprocal and causally active, then it would be possible to change ground control station's interface in a way that it would, for example, make every situation funny, insignificant or so. In this case, the perception of drone operators would change dramatically and the PTSD problem would eventually disappear. The mental health of these men and women would be again all right, but drones' engagement in war would be completely changed. To summarize, the fact that there is a PTSD among drone operators, who do not face any real discomfort connected to war, raises

question why is it that. I propose to look at this problem through lens of the extended mind theory, which will offer us useful explanatory tool to grasp this topic. If we then think more deeply about epistemological problems of this notion, it will offer us, on the one hand, important questions for ontology, philosophy of mind and cognitive science, and on the other hand, another major ethical consequences.

Luiz Augusto Rosa

The relation between James and Damasio: the body loop of emotions and feelings

Abstract: James (1884) argue that contrary to the natural way of looking at emotions as triggering bodily changes, "the bodily changes follow directly the PERCEPTION of the exciting fact, and that our feeling of the same changes as they occur IS the emotion" (JAMES, 1884, p. 189-190). So, according to James, when we see a predator we do not feel fear before running, but we feel fear as we run. Damasio (2010) argues that even agreeing largely with James' theory of emotion, he disagrees about one point: James fused emotion and feeling. For Damasio feeling and emotion are not the same thing, feeling is the conscious experience of an unconscious emotion. Thus what James define as emotion is in fact feeling. Besides this problem, Damasio see other difficulties in James approach of emotion. One of them is that James restricts the cognitive aspect of emotion to the perception of the stimulus and bodily activity, different on the nowadays prevalent view according to which the stimulus goes through stages of evaluation, filtering and channeling in the brain, even if unconsciously, that is, James' vision that the perception of the stimulusdirectly triggers the body activity is no longer supported. However, his idea of the mechanism of emotions and feelings is very much the same as Damasio's theory on the body loop. For Damasio (2010), emotional feelings are composed by both the particular state body during an emotion and the change of cognitive states with the use of mental scripts. And the emotional feelings are processed by areas responsible for creating the images, such as the brainstem and cortex. In the cerebral cortex the area that stands out in the processing of feelings is the insular cortex. This area is responsible for processing the feelings of disgust, for example, important for survival, as well as being associated with visceral functions (representation of the viscera), and, together with the somatosensory cortex, is also responsible for the production of body maps. Thus, Damasio shows the importance of brain areas responsible for processing signals arising from the body in the study of emotions and feelings. CONCLUSION : Both Damasio and James point out the importance of the body in the biological studies of the emotions and feelings.

João Pedro Prospero Ruivo, Tupã Negreiros, Marcos Barretto and Bruno Tinen.

A Model for Facial Emotion Inference Based on Planar Dynamic Emotional Surfaces

Abstract: Emotions have direct influence on the human life and are of great importance in relationships and in the way interactions between individuals develop. Because of this, they are also important for the development of human-machine interfaces that aim to maintain a natural and friendly interaction with its users. In the development of social robots, which this work aims for, a suitable interpretation of the emotional state of the person interacting with the social robot is indispensable. The focus of this paper is the development of a mathematical model for recognizing emotional facial expressions in a sequence of frames. Firstly, a face tracker algorithm

is used to find and keep track of faces in images; then the found faces are fed into the model developed in this work, which consists of an instantaneous emotional expression classifier, a Kalman filter and a dynamic classifier that gives the final output of the model.

Kae Leopoldo, Diego Decleva, Maarten Kamermans and Christina Joselevitch.

Gain Control at the First Visual Synapse

Abstract: Vision at different light levels depends both on how retinal circuits are connected and on adaptive mechanisms that enable these circuits to transmit information optimally as the mean luminance changes. This work investigates how the convergence between rods and their post-synaptic partners, the bipolar cells, affects the transmission of rod signals.

Ana Gomes and Joao Fernando Marar.

Phineas Gage and ADHA. Some related aspects.

Abstract: Comparing personality change due to a brain injury and symptoms of ADHA, we find many similarities as well the same brain area involved in both cases. We expect to obtain more knowledge about cognitive process with this study.

Cacilda Vilela.

Face-to-face interaction and the minimal enchronic unit

Abstract: We propose a new unit of practice for face-to-face interaction, called the minimal enchronic unit (MEU). Based on concepts from Conversation Analysis, Nonverbal Communication and Gestures Studies and the Enfield's notion of enchrony, we qualitatively analyze semi-spontaneous face-to-face interaction. We observe that participants have a practice inside the current-speaker's turn that allow them, collaboratively and in a jointly commitment, dealing with possible moves that could compromise the projectable trajectory of the interaction in progress. Working in the micro level of interaction, MEU allows not only a better understanding of language in use such as how higher levels of sequence organization can be produced in order to search for the preferred social-agreement pact, but also it can help other areas of research such as the Artificial Intelligence to build artificial agents to behave in a more "natural" way.

Paulo Uzai.

A crítica de Armstrong à noção searleana de background

Abstract: O background é um dos conceitos mais importantes na intencionalidade de John Searle. Por ser o fundamento de toda intencionalidade, o filósofo argumenta que não é possível que tal noção seja, ela mesma, intencional. Contudo, apesar de seu aparente externalismo, o background ainda é um conceito mental. Com efeito, por Searle considerar os estados e processos mentais ontologicamente irredutíveis, o background transforma-se, assim, também num conceito irredutível. Porém a não redução e não intencionalidade do background não é

compartilhada por alguns filósofos, dentre eles David Armstrong. Para este, Searle se equivoca quando argumenta a favor dessas duas teses acerca do background (irredutibilidade e não intencionalidade). Armstrong acredita que o background pode ser também intencional, desde que ele seja redefinido em termos diferentes. Com isso o filósofo procura definir a intencionalidade enquanto sistema funcional, dizendo que o background nada mais seria que um sistema funcional mais básico. Ele utiliza o conceito dennettiano de homúnculo, argumentando que cada nível do sistema poderia ser encarado como um homúnculo cada vez mais estúpido, conforme formos descendo os níveis sistêmicos. Apesar de julgar a crítica interessante, Searle não acredita que a noção de homúnculo pudesse dar certo, a não ser no nível da mera analogia. Para ele a intencionalidade intrínseca só faz sentido no nível mental, e não em sistemas inferiores. Concordamos com Searle nesta questão, porém destacamos que a crítica que Armstrong faz, e sua formulação alternativa para o problema do background, é muito interessante se quisermos ainda continuar dentro do naturalismo. Ora, a questão que Armstrong levanta é que se a intencionalidade é um fenômeno natural, então muito provavelmente ela também deve existir em outros níveis, e não apenas no nível mental.

Edilson Rodrigues, Paulo E. Santos and Marcos Lopes.

A Qualitative-Spatial Account for the Brazilian Portuguese Preposition "em"

Abstract: This paper presents a formal definition for some applications of the Portuguese preposition "em" (usually translated as "in") as used in Brazil. Our goal is to establish a mathematical model using Qualitative Spatial Reasoning formalisms and an extension of supervaluation semantics.

Aura Forero.

Integration of the basal ganglia connectivity and structural information to enhance the default mode network detection perturbed by motion artifacts

Abstract: The basal ganglia are subcortical structures important for motor, cognitive and emotional processing. [4] . The default mode network is one of the most studied networks in resting state. Using noninvasive techniques of imagenology, such as fMRI, it is possible analyze the structural, functional and effective connectivity in the brain. sc-fcMRI data are useful for observing functional organization within the human basal ganglia [4]. Based on the anatomical and functional organization of the basal ganglia as prior information, the approach of this work is to perform a new method to detect the default mode network with more robustness. Taking into account that the basal ganglia has been studied since different levels (histological, anatomical, topological and functionally) [2][4][5] and has been demonstrated that the patterns of connectivity with the cerebral cortex and the spatial constraints are two properties of the basal ganglia divisions that facilitate identification with noninvasive neuroimaging methods [1]. The challenge of this work is to use the information from the structural and effective connectivity and present a multiscale [7], multivoxel and statistic method which allows a robust detection of the default mode network in images with artifacts due to movement. The methodology proposed includes a preprocessing of fMRI images using FSL, registration based on an atlas of the basal ganglia [6]. Independent component analysis and anisotropic filtering based on the direction of the connectivity information. Finally, the importance of the research and

analysis of structural and functional connectivity in the brain is highlighted. Also, is important indicate that the method proposed could be helpful for the analysis of cases which involves troubles with memory and learning like Autism spectrum disorder. But specially for diagnosis, control and treatment of pathologies where patients move due their stage such as Alzheimer and Parkinson.

Ricardo Tiosso, Marcelo Benvenuti and Christina Joselevitch.

Behavior Analysis and Neuroscience: Exploring frontiers for a new neuroscientific model

Abstract: The nature and basic processes that underlie behavior and cognition is under constant scrutiny [1]. Experimental Analysis of Behavior (EAB) provides a methodological and theoretical framework that allows the study of the neural bases of behavior without the need to separate behavior processes of learning from basic cognitive processes [2, 3]. According to this school, behavior can be acquired and maintained in either of two ways: by consequences (i.e. positive reinforcement or aversive stimuli trigger the desired behavior), or by association (i.e. an innate physiological stimulus is triggered by the conditional stimulus). However, this framework is underused: EAB does not seek to explain the physiological basis of these behaviors, even though it could [4, 5]. In this context, Neuroscience and EAB can offer each other complementary information. This work reviews the literature in both areas as regards different learning processes and how they can be integrated to research with neural stimulation and reinforcement pathways to seek common grounds for interfaces. Our scientific effort is to investigate how learning and its neural bases can interact in the generation of complexity, without judgment as regards the investigative approach.

Ágnes Urbin and Beáta Korcsok.

Etho-robotics - an insight

Abstract: As service robots gain more ground compared to industrial robots, the field of robotics needs to face new challenges regarding Human-Robot Interaction. Etho-robotics offer a new approach based on human-dog interaction in comparison to the previous approaches mainly based on human human interaction. Etho robotics research integrates ethological principles and methods, mathematical modelling and robotic applications. The interdisciplinary system built up from these helps to create coherent behavior models. The main contribution of this paper is to show an introduction to the mechanism of etho robotics researches showing how can these scientific fields work together in order to support the unavoidable changes in the field of robotics.

Luiz Carlos Vieira and Flavio S Correa Da Silva.

Assessment of Fun in Interactive Systems: a Survey

Abstract: Fun is a fundamental aspect of life that fosters interaction and learning. Hence, it is an important factor for engagement with digital artefacts. The design of engaging artefacts is not a trivial task since fun is subjective: it is context dependent and relies upon the preferences and history of users. A designer must choose the best approach to maximize the chances of an

artefact to generate fun. In this process, assessment is an important aspect. Traditional methods involve observation of users interacting with artefacts and questionnaires to ask what users felt while doing so, while more recent methods involve data collection and physiological measurements. This paper presents a survey on the existing methods for the assessment of fun, considering its constituent elements - attention, flow, immersion and emotions.

Luciana Campos, Ronald Dickman, Frederico Graeff and Henrique Borges.

A concurrent, minimalist model for an embodied nervous system

Abstract: The nervous system has inspired many computational simulations modeling systems capable of learning through interactions with their environment. We propose a minimal model of a nervous system operating in a concurrent manner, capable of maintaining behavior homeostasis of a virtual organism. The model nervous system includes subsystems which, according to the functions performed, may be classified as sensory, effector, cognitive or emotional. These subsystems, while autonomous, exchange messages between one another. The organism is endowed with innate behaviors of exploration, approach, eating and resting; the nervous system affords the possibility of learning through evaluation and memory of experiences associated with these behaviors, interacting with a virtual environment. These experiences influence the selection of subsequent actions, to promote self-regulation, and thereby, survival of the organism. The proposed model is concurrent, asynchronous and non-deterministic. We simulate a simple realization of the model. Our results show that the expected behaviors of establishing food preferences in fact emerge. We conclude that the model is functional and robust and that learning increases longevity.

Wallas Pereira, Angelo Loula and Joao Queiroz.

Pointing gesture for communication between robots

Abstract: Communication has an important role among social animals, being a fundamental trait for their organization and survival, nevertheless, its origin and evolution still holds several open questions. One of the many studied forms of communication are gestures, used as symbolic conventions and also to support verbal communication. A particularly interesting gesture is human pointing, for it does not present a unique meaning, contrariwise, it provides contextual information (deictic) by directing attention to an object of mutual interest establishing shared and joint attention. The pointing gesture is an indispensable precursor to social learning among humans. One of the most significant difficulties to the studies of the origins and evolution of the communication is the lack of empirical data, once such processes do not leave fossils, with which one could perform observations and analysis, and the established systems come from many generations, in such a way that that, adopting a new system is not interesting for their users [4]. Computer models and simulations are a way to circumvent these issues, giving a great contribution on this subject. Computational approaches allow to express theories and hypotheses as computer programs, granting a way of defining different scenarios with the possibility of manipulating several aspects, which permits the investigation of the influence of many of them in a given subject. Many models and simulations involve agents in an environment, which are meant to perform a given task or a set of particular tasks, for which they can obtain any kind of benefit by using communication. Individuals are evaluated, not directly

in relation to their communicative capacity, but, by the benefits brought by the development of their capacities for communication. We propose to investigate conditions for the emergence of pointing gesture interpretation among robotic agents, applying a computational modeling approach. As pointing gestures have referential properties, we bring forth the theoretical framework of C.S. Peirce semiotics, to define the pointing gesture as an index, such that the pointing gesture is connected to its referent by means of a relation of physical contiguity, holding no resemblance or symbolic relation to it. Accordingly, the interpreter must rely on spatial temporal relations to determine the referent for such gesture. As an initial experiment a community of simulated robotic agents are evolved to recognize a pointing gesture, performed by one robot agent and seen by another one. The ability to interpret the gesture and determine its referent is not pre-defined, but we apply techniques of artificial evolution to adapt the neural cognitive architecture of the robot, which are equipped with cameras as inputs. Objects with different colors are randomly placed in the environment and robots are evaluated according to their ability of identifying the pointed object in the scenario. Simulations of this experiment indicate that agents can successfully interpret the pointing gesture by returning the color of the pointed object. This is a work in progress with initial results. We plan the next experiments to allow the emergence of both the gesture producing and gesture interpretation and further analysis of how the indexical relations are established in the cognitive architecture of the agents.

Camila Agostino and Yossi Zana.

Long-term time perception: A Pilot Study

Abstract: Patterns of intertemporal choice were explained by biases in the temporal perception. However, methodological limitations in the time perception estimations suggest a necessity for new measurements. The aim of this work was to estimate the temporal perception in relation to objective time in the scale of month units. Six adult participants were allocated in three groups, two in each: (I) Temporal estimation followed by numeric estimation; (II) Temporal estimation followed by numeric estimation with feedback; (III) Numeric estimation. The temporal estimation consisted of the presentation of a specific time interval between today and 36 months followed by a 180 mm line. The participants were instructed to indicate, with a click on the line, the length that corresponds to the perceived temporal distance. Three blocks with 10 time intervals each were presented in a pseudorandom order. The numeric estimation task had the same procedures, but instead of presenting time intervals (number and month unit), only numbers were presented. The numeric estimation task with feedback was identical to the numeric estimation task, with the addition of a visual mark indicating the correct length and a beep tone when the deviation was greater than 2.6 mm. Temporal perception was linearly correlated with calendar time with $R>=0.98$ for all four subjects with $P<0.00$. Numerical estimation was linearly correlated with line length with $R>= 0.97$ for all four subjects with $P<0.00$. Numerical estimation with feedback was linearly correlated with line length with $R>= 0.98$ for all two subjects with $P<0.00$. This pilot study results suggest that the paradigm commonly used to measuring time perception should be revised, thus justifying a full-scale study.

Thales Estefani, Pedro Atã and João Queiroz.

E-picturebooks and Cognitive Niche Construction

Abstract: This research project, which is still in its initial steps, introduces a theoretical framework for investigation of the cognitive and semiotic impacts of digital storytelling. Our approach is based on recent approaches in situated cognitive science and cognitive semiotics -- distributed cognition and cognitive niche construction -- that reconsider the relation between human cognition and the environment. The notion of distributed cognition has challenged the relevance of skin and skull as clear spatial boundaries of mental activity. Niche Construction Theory re-frames the discussion on evolution, moving the co-influence between organism and environment, from a peripheral position to the center of the evolutionary process. Cognitive niche construction can be characterized as evolution of cognitive abilities through a feedback cycle between problem spaces and cognitive artifacts. Initial modifications in the artifacts available in the environment alter problem-spaces that pressure for further developments in the artifacts and so forth, specializing cognitive activities. We analyze e-picturebooks (digital picturebooks) as cognitive artifacts and their role in cognitive niche construction. As we are dealing with cognitive niche construction, our framework can be applied to cultural evolution in general, such as in other types of recent transformation in interactive media (computer games, audiobooks, digital photography, hyperliterature). We investigate (i) how the problem space of storytelling is structured on cognitive artifacts, (ii) what are the specific semiotic features of e-picturebooks and how these features can alter storytelling production and interpretation, and (iii) how these alterations influence cognitive abilities regarding storytelling tasks. Answering question (i) requires an operational definition of storytelling as a problem space and identification of specific artifacts and semiotic features which produce effects that are observable and relevant for that problem space. Answering question (ii) requires analysis of examples and comparison between e-picturebooks and other forms of storytelling (digital or not). Answering question (iii) requires a model of the integration of the semiotic features identified in the answer (ii) and the inference of probable effects of these features in the storytelling niche. In the following paragraph we present an initial plan for the investigation on the cognitive-semiotic nature of e-picturebooks and some of its most salient features. The task, or problem, that the term 'problem space' refers to in the first question (how the problem space of storytelling is structured on cognitive artifacts?) is that of story. How do people produce and interpret stories to make sense of the world? The problem space (and the set of possible problem states) can be described as the possible causal links between semiotic entities and processes and high level structures (defined as boundary conditions or organizational principles) that influence these links. The "boundary conditions" have a downward effect on the spatiotemporal distribution of lower-level semiotic items [9]. Cognitive artifacts are the devices that allow navigation through the problem space (i.e., transition between problem states). What are the specific semiotic features of e-picturebooks and how these features can alter storytelling production and interpretation? Specific semiotic features of e-picturebooks include gestural repertoire, superposition of non-linear interactive elements, tendency of gamification, navigation conditioned to a specific interaction, multimodal textual forms, multimedia resources (video,animation,audio).

José Francisco Santos Neto and Paulo Rogério Miranda Correia.

Computational tool for structural analysis of concept maps for assessing mappers proficiency

Abstract: Concept maps are graphical organizers containing concepts embedded into a propositional network. Each proposition (initial concept - linking phrase -> final concept) presents a linking phrase to explicitly declare the conceptual relationship between the concepts. The meaning can be easily checked and commented for any reader due to the role of propositions as semantic units. Therefore, concept mapping is a powerful way to externalize and share meaning with clear applications in any educational setting. Other graphical organizers (e.g. mind maps) are associative in nature and the conceptual relationship is implicit at best. For example, there are several different forms to relate the concepts "cognitive science" and "field of research" and all of them can fit into an associative map. On the other hand, the concept map asks for a linking phrase ("cognitive science - is an interdisciplinary -> field of research") to reach a precise and understandable message. The meaning of this proposition can be readily discussed by anyone interested in the mapped topic. The creation of concept maps is a complex task because it involves the content to be represented (intrinsic cognitive load) and the procedures to set up an acceptable map (extraneous cognitive load). A training period on the technique is critical to support beginners to avoid cognitive overload. Our research group has investigated the effect on training strategies on mappers' proficiency during the last 5 years. We observed that specific structural changes in the propositional network indicate the increase of proficiency on the concept mapping technique. The aim of this paper is to model and build a computational tool to automatize the structural analysis of concept maps and to provide a feedback about the user's proficiency level. The effective use of concept maps in large scale (e.g. MOOCs and corporations) requires a training period that must be scaffold by experts through an automated system. The structural analysis we developed consider 8 parameters to fully describe the propositional network morphology. The design of the computational tool consider the following steps: (a) receive the file containing the concept map, (b) validate the received file, (c) calculate the parameters related to the structural analysis, (d) select a specific feedback considering the concept map morphology and (e) show the feedback and additional instructions to keep the users improving their proficiency on concept mapping. Preliminary results will be shown during the poster presentation.

Maria Alice Leal and Angelo Loula.

Emergence of Bodily Gestural Communication among Robots

Abstract: Communication, one of the most outstanding traits in animals, has inspired interest and curiosity in researchers for a long time concerning its origin and evolution, but it is still unknown how this social phenomenon emerged or how it has been modifying itself to become what it is nowadays. One particularly important type of communication are gestures, visible body actions used to convey 'intention, interest, feelings and ideas' [2]. It still an open question whether gesture or vocalization came first in communication traits, or whether gesture only has a complementary role in oral communication. In fact, some [Gilliespie] advocate in favor of a co-evolution of these two cognitive skills. Others [pollick 2007] study the possible influence of the gestures in the emergence of vocalization, as in some primates with common ancestor to human beings gestures are more developed than vocalization, suggesting gestures could be the first cognitive skill to emerge. So, it's extremely important to study gestures, to understand its nature

and provide more evidence to determine which of these cognitive phenomena derived first or how they are related. As there are no fossil artifacts associated to communication and language [4], it is not possible to determine how different types of communication have emerged or which are the conditions related to its origin. Thus, computational modeling has aroused and been established as a fruitful tool to study such processes. Through computer simulation it is possible to test and run a great amount of scenarios about cognition skills evolution in a shorter time than if it was to follow its natural course. In such studies, basic cognitive principles are predefined for artificial agents, but the particular process of interest must emerge by means of adaptive or evolutionary mechanisms during agents' interactions. In many previous works, a dedicated communication channel is present (e.g. sound channel, radio frequency channel, or light color channel) We propose to study the emergence of gesture communication among robots using their body movement as the means for communication. Here we use motor skill and visual perception, as the basis for gesture communication will take place. One of the situated agents should provide movements (bodily gesture) to convey a meaning, while the other agent should perceive that movement and determine the original meaning from the first agent in the interaction. More specifically, as an initial step of this project, we have developed an experiment where robots, controlled by artificial neural networks, are evolved to perform a double task of generating different body movements depending on the scenario and also of recognizing these bodily gestures from other robots. The robots have ground sensors for color perception and proximity sensor to perceive movements from the other robot. The robots also have wheels and motor, besides a LED ring that can be lit with different colors. The speaker robot may move right or left depending on color of the ground. The interpreter robot should grasp the speaker movement with its proximity sensors and turn a given color on in its LED ring. The purpose of this initial experiment is to observe if the interpreter is able to determine the ground color perceived by the speaker, only by perceiving its movement. Initially, we have the speaker skills and actions pre-programmed, so we are evolving only the interpreter, which has input neurons with time decayed activation. This is a work in progress, and first results show that he interpreter is able to partially perform the task. We are running more tests and adjusting experimental parameters to find out why the interpreter wasn't able of recognize bodily movements in al test configurations. After that, we are going to model a more complex experiment with the evolution of both agents in a more demanding task.

Richard Hanley.

Skepticism revisited: Chalmers on The Matrix and brains-in-vats

Abstract: Thought experiments involving The Matrix, brains-in-vats, or Cartesian demons have traditionally thought to describe skeptical possibilities. David Chalmers has denied this, claiming that the simulations involved are real enough. Through an examination of kind terms I argue that, though the Chalmers view may be otherwise attractive, it is not an antidote to skepticism.

Rogerio S. Teza.

The Persistence of Mental Representation and the different levels of representation

Abstract: This poster is to present a currently graduation research in philosophy of mind. The aim is to show that considering different levels of representation, there is no room for anti-representationalism.

Lucas Machado.

 É a consciência uma tela que vê a si mesma?

Abstract: Resumo: Em nossa apresentação, proporemos, a partir da discussão sobre a natureza do fenômeno da percepção visual e de sua relação com a consciência, uma concepção sobre o âmbito em que o fenômeno visual se daria que, acreditamos, pode contribuir para conceber a consciência como uma tela que vê a si mesma, ou seja, como um sistema cuja informação produzida só é acessível ao próprio sistema que a produziu. Esperamos, assim, pela metáfora da tela que vê a si mesma, fazer uma pequena contribuição para a reflexão filosófica sobre o fenômeno da percepção visual e, por extensão, para a reflexão filosófica sobre a consciência e sobre o problema difícil da consciência.

Daniella de Aguiar, Pedro Atã and Joao Queiroz.

Creativity as niche construction and some examples in theatrical dance

Abstract: Creativity can be regarded as a property of semiotic resource exploration and niche construction. More specifically, and according to this perspective, creativity is distributed, in cognitive niches, as opportunities for niche-construction. Artistic cognitive niches represent established ways to exploit available artistic semiotic resources. When such opportunities are explored so that new relations between cognition and artistic semiotic resources are established (i.e., the artistic cognitive niche is constructed), then creativity is observed. This process of niche construction involves the transformation of problem spaces ("a branching-tree of achievable situations") through the exploration of cognitive artifacts design of new of artifacts (in dance, for example, softwares, techniques, equipments such as dance shoes, stage, dance and music notations). Our approach is supported by specific examples in history. In each of these examples, the introduction of artifacts changed not only how to make dance, but also the very concept of dance, opening opportunities for the exploration of new niches.

Edison De Jesus Manoel, Pedro F.V. Felicio, Roberto Gimenez, Cristiane Makida, Rafael Do Nascimento Soares and Alessandro Freitas.

Proprioceptive-visual integration and situated embodied cognition: A developmental perspective

Abstract: Knowledge and sensory-motor integration are related in situated embodied cognition. In the present paper, we investigated whether the transition between egocentric and decentred mode of thinking are associated to the development of intra-sensory and inter-sensory integration. Thirty six children with ages between 5, 7 and 9 years performed a paramedian

correspondence task with conditions requiring inter-sensory integration (visual-proprioceptive) and a problem solving task. Using a mirror perturbed the sensory judgments in the paramedian correspondence taks. The results did not corroborate the thesis presented, nevertheless the increasing importance of proprioception in the perceptual judgments for older children suggests that although younger children maybe body centred (egocentric mode of thinking), older children seemed more able to use body to mediate their perceptual judgements.

Garri Hovhannisyan and Caleb Dewey.

Natural and Normative Dynamical Coupling

Abstract: This paper argues that cognitive systems obtain their dynamical coupling to the world through the continual realization of relevance. We establish this thesis by an induction from two premises. The first premise is that cognitive systems are autopoietic systems. To confirm this, we draw from the definition of autopoiesis found within the enactivist framework for embodied action [10][11]. We find that self-promotion, an essential component of autopoiesis, implies that cognitive systems develop normatively as well as naturally (i.e. that there are both normative and natural attractors). The second premise is that cognitive systems constitutively realize relevance via opponent processing. We draw from and elaborate on Vervaeke, Lillicrap and Richards' framework of relevance realization [12]. We note that their account does not explain how it is that cognitive agents lose and regain their dynamic coupling (which is constitutively relevance realization) with the world via the loss and reacquisition of meaning. This creates a demand for an account of dynamical coupling in terms of relevance realization, which our thesis promises to accomplish. Thus, we propose that the capacity for insight is a central function of relevance realization, comprising the cognitive agent's capacity to re-adapt to the given situation by realizing novel relevance. The capacity for insight, as well as the tendency to become fixed on irrelevant information resulting in the incapacity to address real world problems, is then illustrated in terms of a proposed theoretical learning architecture, coined the Ouroboros Learning Mechanism (OLM) [5]. The OLM explains how cognitive systems obtain their dynamical coupling to the world in terms of the continual realization of relevance, thereby confirming our thesis.

Edilene De Souza Leite.

Monism of Triple Aspect a proper concept to sustain the ontology of the nature of mind-body in Meditation

Abstract: In the West Meditation has been for so long restrict to religious issues or to spirituality. However, after the popularization and increase of the debates and researches about consciousness issues in the latter century, the interest for the topic has increased on neuropsychological e philosophical studies, because it could offer as a technique tools for stabilization of the mental states. Pragmatically some areas related to health problems had since very early already taken advantage of the practice of meditation because of its beneficial effects, as for stress relive, arousal of attention and concentration, or treatment of chronic pain. In a published article, Attention regulation and monitoring in meditation (LUTZ et al., 2008), after monitoring neuronal activity during meditation, the authors related meditation states with very high frequencies. Beyond this there is many articles indicating that the practice of meditation

affects not only the type of activity in the brain, but can also change its structure physically, strongly indicating correlation of mental activity and brain, but not enough to warranty casual correlation. Nevertheless, there is still a lot of debate about the possibility of this kind of measurement of mental activity. In addition, there is many different traditions and types of techniques for meditation, what leave us in this moment without an agreement about the concept of what is meditation and what would be a proper technique (SCHMIDT & WALACH, 2014). For some scholars meditation is the exercise of the consciousness turning it to its self. All this results, of the research on meditation, implies issues that affect many concepts of the ontological nature of the mind-body, leading to a star point where all those notions of body-mind must comply with the understanding that mind and body are an unity with complementary properties. Walach sustain that we should look for a monism where "Mind or consciousness would not have to somehow arise but it would be an original complementary aspect to matter." (2015, p. 81), he also proposed in the book Secular spirituality that we could have specific access to reality through meditation, in addition to what we can learn trough perception. In this work, we aim to exposes that the PEREIRA JR 's concept of Monism of Triple Aspect could satisfy the requirements for the ontology of the nature of body-mind during meditation, and this concept could also offer a hypothesis to the relation of the practice and its effects on the behavior and in the physiology of the body.

Mariana Matulovic and Maria Eunice Gonzalez.

Self-organization and circular causality: where are we going with neo-mechanicism?

Abstract: In this paper, we investigate the role of self-organization processes in the dynamics of complex systems. Our investigation is grounded on the four principles of adaptive information processing in decentralized systems, proposed by Mitchell [2] and summarized here as: i) Global informational patterns are encoded over the system's components; ii) randomness and probability are essential to the dynamics of systems with a relatively small number of components, enabling exploration of different connection possibilities; iii) complex systems often carry out a fine-grained parallel search for possibilities; iv) the systems express continuous bottom-up and top-down systemic interactions. It is argued that a common characteristic of these four principles is the presence of feedback mechanisms applied to self-organization processes in systems that deal with situated and embodied information. In this kind of system, order parameters might emerge (at the macroscopic level) from spontaneous interactions established among elements at the microscopic level [1]. According to Haken [1], when order parameters emerge, they enslave the behavior of the elements that gave them origin, in a kind of circular causality. Our goal in this work is to provide evidence to support the hypothesis that the development of self-organized systems grounded on feedback mechanisms (expressed as circular causality) might bring about a type of neo-mechanism. When operating in accordance with the four principles of adaptive information processing proposed by Mitchell, such neo-mechanism could cause unpredictable outcomes in the physical, biological, and social spheres of life.

Amanda Veloso Garcia.

A non-linguistic analysis of information: the possibility of other forms of expression of thoughts

Abstract: With the advent of science and technology, the relation of a large portion of human beings with each other and the world has changed significantly. The exams to identify diseases and treatments increasingly specific, the possibility of communication through image and sound at any time with people from different locations, the use of Internet for different everyday tasks and even banking use, etc., have made our relations more "fast". On the other hand, the Internet has enabled to the subjects of industrialized societies - those who have access to the internet and technological resources - also the globalization, allowing knowledge and experience of different cultures of the world, which leads to the estrangement of the other and questioning himself to draw comparisons with other habits and practices. Expanding look through the information technology requires a different view of the world, since it takes the indirect contact with each other. Questions like: "My culture is actually the existing better?" or the adoption of a different culture of the local habits have become commonplace today. In a world where borders are becoming less rigid, it is necessary a new look. The great diversity of habits with which we have contact every day requires to consider the various points of view to think the current problems. And so, a view through the paradigm of complexity looks promising and convenient nowadays. The paradigm of complexity provides a view at the world through different methodological and epistemological perspectives to understand a phenomenon. Starting from the need to expand the look, the aim of this paper is to discuss the relation between the study of the thought and the presence of oral/written language as parameter to think. During the twentieth century there was a paradigmatic revolution in philosophy, which was later called "linguistic turn". This paradigm shift was made through an overvaluation of language understanding it as the center of discussions. In other words, with the linguistic turn, oral/written language came to be seen as capable of solving philosophical problems, so that the task of philosophy would be to clarify the language. From this perspective, several problems were seen as pseudo-problems to be only due to difficulties in the use of language. The linguistic paradigm spurred a series of debates around the thought and intelligence, whose researchers are busy trying to simulate machines in human mental processes to find out what is the mind. Such studies make use of linguistic rules for the simulation and linguistic expression as a criterion for evaluation of the tasks performed by machines. It is intended, in this study, discuss the limits and possibilities of linking thought to language, in order to analyze other forms of expression of thoughts. The linguistic paradigm that generates consequences for what we mean by "thought", excluding other ways of thinking, as well as some indigenous and Oriental thoughts. In this work, we will try to discuss the potential of thought expression in other forms such as painting and gesture.

Bruno J. M. De Camargo and Peter M. E. Claessens.

Dynamics of Subjective Contrast in Sequential Comparison of Gabor Patches

Abstract: In a comparison of two asynchronous and spatially-separated luminous disks, the second stimulus has a tendency to be evaluated lighter against a dark background and darker against a lighter background, suggesting a temporal context effect to the perceived contrast rather than on luminosity. The current study confirms this hypothesis by direct evaluation of contrast comparison of Gabor patches, stimuli that have intrinsic contrast.

Renata Souza.

Synchronization, self-organization and creative action: new horizons in cognitive science studies

Abstract: The goal of this paper is to investigate the notion of synchronization of rhythms and its possible contribution to the understanding of creative action in the context of cognitive science studies. The following question is therefore posed: how can the concepts of rhythm and synchronization help in understanding self-organized creative processes, in the context of human action? During the progress of human civilization and the emergence of complex social interactions that include specific routines, human beings have increasingly distanced themselves from their natural rhythms, gradually becoming dependent on specific non creative actions implemented at strategically planned times. As a result, the dynamics of synchronization of the body's rhythms to the environment has been reduced to a secondary role. In this context, we will argue that an understanding of the notions of rhythm and synchronization can provide a favorable context for creative action. In the terminology of Bohm (2011), a creative action lies in the perception of new orders underlying the organization of the environment. This order allows the creation of structures that are convergent with the characteristic of wholeness and perceived harmony. One of the main driving forces underlying creative action is given by the following dynamics: the perception of the lack of synchronization and the attempt to resolve it. This perception enables the search for ways of achieving harmonization between individuals and their environments. In our presentation, we are going to explain this dynamics in terms of processes of stabilization and rupture of habits, due to the perception of a given anomaly and the attempt to resolve it from building hypotheses that supposedly would solve the problem. This process characterizes what Peirce calls abductive reasoning (PEIRCE, 1977, p. 220). We understand that the perception of the origin of the lack of synchronization with natural rhythms may propitiate the search for ways of harmonizing individuals in their respective environments. In summary, our hypothesis is that the search for synchronization –given at different levels of analysis (social, biological, and environmental) – is one of the main driving forces underlying creative knowledge/action.

Ian Oliveira and Joao Eduardo Kogler Junior.

A software platform for adaptive systems modelling and simulation, with application to the study of cognitive processes

Abstract: We present AWARE 2.0 and propose its use in two scenarios of experimental study of cognitive processes. AWARE is a software meta-system targeted for building applications using Adaptive Finite State Machines (AFSMs). We conceived and developed AWARE intended for applications in the realm of cognitive processes expressible in AFSMs and, in this research line, we are launching two projects. Firstly, we describe some of the new features added to the original version of AWARE and then we propose the application projects, the first targeted to the understanding of the dynamics of learning by agents inside dynamic environments, and the other proposes the study and formal modelling of the topological transformation sequences that arise from the adaptations employed by autonomous systems, when these are in the process of solving a problem by interaction driven learning.

Peter Maurice Erna Claessens, Victor Gregório De Queiroz Lima and Manasses P. Nóbrega.

Learning and perception of causality

Abstract: Causality is the term used to refer the relationship between a "causative event" and a "subsequent event" that former seems to be inducing. The sense of causality is an assignment of the mind that is not immediately given by the impact of the physical world on the subject. According to Hume, the idea of causality must be derived from three basic criteria: (1) contiguity: if A causes B, then A and B are contiguous both time and space; (2) temporal succession: if A causes B, then A precedes B in time; (3) required connection: if A causes B, then B invariably occurs when A occurs. As a first approach, the principles of causality described by Hume look pretty solid, both natural and scientific inference of causation. The pioneer in scientific research on the perception of causality was undoubtedly Albert Michotte. As Gestalt psychologist, Michotte was interested in the factors that cause the sense of causality as an emergent property of visual stimulation. His experiments suggest that an important aspect in the sense of causality is the temporal contiguity. However, recent studies have been shown the relationship between voluntary action and subjective time, called intentional binding: in those situations which subjects are agents of the actions, the perceived time between action and its consequence is smaller than the subjects of passive situations. Since, many studies have been considered both the role of causality and agency in intentional binding. We present a study about the role of spatial and temporal intervals on the sense of causality in agency situations. A new paradigm centered on dynamic Poisson process as stimulus was implemented. In the pilot experiment reported here volunteers are tasked to press the mouse button at any time and position in the computer screen and to observe a presentation of random points at the monitor. Maximum distance, time intervals and the rate of points per second was controlled. After each trial the volunteer indicated his "belief" to have caused or not the event indicating a level of certainty handling a featured slider on a numerical scale at the screen, from 0: 'certainly I did not cause' to 100%: 'certainly I caused' the points presentation. The data analyzed so far indicate a systematic negative trend only in the time interval, i.e. the higher the temporal interval between the action and the appearance of the stimulus, the less the sense of causality. We also discuss how the random aspects in the presentations may have influenced the sequence of events and this is a basis for a more detailed future analysis.

Walter Lima Jr. and J. Reinaldo Silva.

From Licklider to Cognitive Service Systems

Abstract: This article investigates the seminal concepts of J.C.R. Licklider about the interaction between man and computational machine and its evolution over the years after the publication of his article \textquotedbl{}Man-computer symbiosis\textquotedbl{}, in 1960, in his subsequent work. Surprisingly, Licklider work cross the time line going through epistemological cuts, distinct scientific advances, technological innovations, and survived new possibilities of relationship between human and computational machines occurred in the last 50 years. Despite technological difficulties to totally implement concepts of Man-computer symbiosis, many technological branches are advancing to accomplish the intentions foreseen by Licklider, converging from different viewpoints.

Josiane Gomes de Oliveira and Sílvia Helena Guttier Faria.

Moral action and complexity: An essay on human morality based on self-organization theory

Abstract: Based on the systemic method of analysis, we propose in this paper to investigate the concept of human morality as a product of recurrent self-organizing processes in the society. We intend to analyze how the dynamics of systemic interaction between environment and individual can affect the production of the universality of moral actions in certain social groups and, above all, we intend to interpret this dynamic as a self-organized process. We will analyze some of the key concepts that integrate science systems, taking as starting point the Theory of Complex Systems, for the purpose of we enter into our discussion of the principle of moral action on the complexity science. Generally speaking, we can say that a complex system is composed of a set of individual elements in interaction expressing an organization, which has a functionality: contribute to the system behavior. According to this idea, the society can be understood as a system in which their individuals are the elements that maintain relations with each other and are in constant interaction. Considering the possibility of crediting the systemic interactions present in society to self-organized processes, we will adopt the perspective of the theory of self-organization proposed by Michel Debrun. According to this theory, self-organizing processes are those that grow up without a center-controller and are informationally open. Therefore, we understand that in the social groups occur self-organizing processes that result from the relationship between individuals who maintain a relationship with each other. So, our central question focuses on the following hypothesis: because the society is interpreted as a system, based on the perspective of analysis of the complex systems, can be the moral action understood as a product of self-organized processes?

Luana Camila Marques and Juciane Terezinha Do Prado.

Possible solutions to the mind-body problem: Nagel and Searle

Abstract: The mind-body problem is to explain, for example, how the mind and the body can affect each other. In the twentieth century, in particular, various perspectives were proposed in order to solve such a problem. In this work, we present and compare two approaches to mind-body problem, proposed by Searle and Nagel. One goal of these thinkers is to overcome the problems attributed to the dominant approaches in the study of the mind, both the materialists versions and the dualism of substances. The proposal offered by Nagel argues that there is only one substance involved in the mind-body relationship. It is a physical substance, attributed to the brain. However, although it is the basis of the mind, the brain is equipped with a special set of properties, not physical, which no other kind of object features. They are characteristic of conscious intelligence, considered not physical in the sense that they can never be reduced or explained in terms of the concepts of habitual physical sciences. Searle, in turn, develops a new perspective to this issue, seeking to eliminate the mind/body dichotomy in the existing dualistic approaches. According to Searle, the mind-body problem has a simple solution: mental phenomena are caused by processes taking place in the brain, but can not to be reduced to it. Thereby, such thinker argues that the mind-body problem can be easily solved from a Biological Naturalistic posture. He suggests a causal relationship between the brain and mental phenomena, irreducible to it. However, it does not propose two categories of phenomena. Somehow it can be said that because the brain itself. This presents a problem with regard to

causality: the cause and the effect are directed to the same object. Mental phenomena are caused by processes occurring in the brain and are at the micro level, as of synaptic transmission between neurons, occurred in the macroscopic level. The purpose of these two proposals, the Nagel and Searle, is suggest a reasonable explanation of mind-body problem, looking suit his views in a scientific approach to mind. We going to compare these two approaches and analyze in what sense they are suitable for solving the problem of the mind body connection.

Nathália C. A. Pantaleão and Franciele Da Silva Leal.

What we're made: An analysis of the relevance of the body in cognitive processes

Abstract: The objective of this paper is to investigate the relevance of embodiment in cognitive processes from a situated and embodied perspective. For that we will use the critical by philosophers to the representative model of cognition (CLARK, 1997, 1999, 2003, 2008; CHEMERO, 2007, 2012). According to proponents of the theory of cognition situated and embodied, the process of cognition can emerge from the interaction of the physical attributes of the bodies with the environment in which these bodies are situated. Clark, one of the advocates of the approach, advocates, including the cognitive processes cannot be adequately investigated without taking into account the roles that embodiment, the action and the environment executes in such processes (1999). It is to be situated in an environment and incorporate relevant information for a given agent that is active and not just representations generator. Thus, we argue in favor of the hypothesis that the body structures in its systemic unit, play central roles, not just peripheral, in cognitive processes that involve complex skills. Thus, we will analyze what the process of acquisition and development of complex skills is not limited to the manipulation of mental representations, and what is the scope of the hypothesis of the existence of an intrinsic dynamics between agents and their environments.

Mirella Telles Salgueiro Barboni, Balázs Vince Nagy, Cristiane Maria Gomes Martins, Tina Tsai, Francisco Max Damico, Givago Da Silva Souza, Marcelo Fernandes Costa, Luiz Carlos De Lima Silveira, Jan Kremers and Dora Fix Ventura.

Physiological mechanisms underlying ON and OFF visual perception in humans

Abstract: Electrophysiological methods such as electro¬retinography (ERG) and visually evoked potentials (VEPs) allow the assessment of retinal and cortical physiological mechanisms for specific visual functions that can also be assessed by psychophysical methods. The present report compares results obtained with the two methods to show that they can be relevant in understanding visual cognition.

Samuel Bellini Leite.

The Revisionist Strategy in Cognitive Science

Abstract: In this paper I provide an analysis of the frame problem in order to propose the revisionist strategy for cognitive science. Such strategy aims to describe a recipe for how cognitive science should proceed in dealing with the frame problem. The idea is that theoreticians should start by identifying various sub-instances of the frame problem (of which

we provide a first list) to be used as guides for reformulating frameworks of cognitive science and how they relate. Various approaches could follow this recipe but as an example we will see how the ideas of situated cognition can help re-think ways of dealing with these sub-instances which emerged in the classic symbolic approach. This also shows how the situated approach can be seen not as a new science but as new ideas that can shape the same science.