CIMeC Seminars 2016

When: mer, 21 dicembre, 11AM – 12PM

*Where***:** ACN lab - seminar room II floor, piazza della Manifattura 1 - Building n.14

Speaker:
- Prof. Francesco Nazzi, Dipartimento di Scienze AgroAlimentari, Ambientali e Animali, University of Udine

Title: **Ethology meets pathology. The case of honeybee colony losses**

Abstract: It is now ten years since the first reports about sudden collapses of honeybee colonies were reported in the US and now widespread colony losses are a major concern for beekeeping and agriculture in most countries of the northern hemisphere. For this reason, honeybee pathology has become an important issue for researchers worlwide, somehow obscuring other disciplines that used to play a major role in the context of bee sciences, including, for example, neurophysiology and ethology. However, recent studies revealed a number of points of contact between these disciplines and bee pathology that would deserve a great attention for the possible important implications. After shortly reviewing some essential aspects of bee pathology, some of the possible intersections between ethology and pathology will be presented and discussed.

Host: Giorgio Vallortigara

When: mer, 21 dicembre, 05:00 PM – 06:00 PM

*Where***:** CIMeC, Corso Bettini 31 Rovereto 3rd floor seminar room

Speaker:
- Prof. Christian Ruff, Laboratory for Social and Neural Systems Research, University of Zurich

Title: **Neural foundations of social norm compliance**

Abstract: Human behaviour in all known cultures is heavily regulated by social norms, widely shared standards of how one ought to behave in given situations. These norms cover most aspects of behaviour ranging from mundane (dress codes and table etiquette) to deeply ethical actions (fairness and honesty). Compliance with such norms is fundamentally important for the success of institutions and collective welfare, and failures of norm compliance can have severe financial and societal consequences. Despite this importance, it is largely unknown which personal and situational factors determine our individual ability to comply with social norms. In my talk, I will present a series of experiments that identify brain processes that are biological prerequisites for social norm compliance. By combining experimental games with non-invasive brain stimulation techniques and functional neuroimaging, these experiments show that the human brain contains at least two mechanisms that are necessary for fair and honest behaviour. These mechanisms exert their effects by either enhancing the sensitivity to social incentives for norm-compliant behaviour or by selectively biasing the trade-off between financial and moral values associated with norm-compliant actions. The precise properties of these mechanisms may have interesting implications for the possibilities and limits of interventions designed to enhance collective norm compliance.

Host: Giorgio Coricelli

When: mar, 20 dicembre, 10:00 AM – 11:00 AM

Where: CIMeC, Corso Bettini 31 Rovereto 3rd floor seminar room

Speaker:
- prof. Christoph Kayser, Full Professor of Neuroscience at the Institute of Neuroscience and Psychology of the University of Glasgow

Title: **The cortical organization of multisensory perception**

Abstract: We perceive our environment through our different senses, such as by hearing, seeing or touching. How the brain merges the information from our senses still remains unclear. I'll present some of our recent studies that use a combination of behavioural tasks, behavioural modelling and neuroimaging. Specifically, our research focuses on extracting neural signatures relevant for supporting the specific benefits that characterize behaviour in a multisensory environment, and to exploit these to link specific neural processes to perceptual choice. This has allowed us to localize the multisensory benefits for audio-visual motion discrimination to higher visual cortical regions and to processes that are intermediate to early sensory encoding and late decision processes. When combined with manipulations of sensory congruency this approach further reveals that neural correlates of perceptual weighting and causal inference occur at different times during a trial, also within sensory cortices. Overall these findings support the notion that multisensory processes occur within areas traditionally considered as unisensory (so called early multisensory effects), but also demonstrate that distinct multisensory computations seem to occur at different times during the transformation of a sensory input into a perceptual choice.

Host: Giorgio Coricelli

When: gio, 15 dicembre, 11:00 AM – 12:00 AM

Where: Via delle Regole, 101, Mattarello, Province of Trento, Italy Conference Room

Speaker:
- Marco Mantovani, Postdoc Università degli Studi Milano-Bicocca

Title: **Cognitive ability and games of school choice**

Abstract: We take school admission mechanisms to the lab to test whether the widely-used manipulable Boston mechanism disadvantages students of lower cognitive ability and whether this leads to ability segregation across schools. Results show this is the case: lower ability participants receive lower payoffs and are over-represented at the worst school. Under the strategy-proof Deferred Acceptance mechanism, payoff differences are reduced, and ability distributions across schools harmonised. Hence, we find support for the argument that a strategy-proof mechanism ``levels the playing field''. Finally, we document a trade-off between equity and efficiency in that average payoffs are larger under Boston than under Deferred Acceptance.

Host: Giorgio Coricelli

When: gio, 1 dicembre, 4:00 PM – 5:00 PM

Where: Corso Bettini, 84, Rovereto, Province of Trento, Italy Palazzo Istruzioni, Aula Magna

Speaker:

- Prof. Micah Murray, University of Lausanne

Title: **The Multisensory Scaffolding for Perception, Sensory Substitution and Memory**

Abstract: This talk summarizes our efforts to identify the spatio-temporal brain mechanisms and behavioural relevance of multisensory interactions in humans and the consequence such has had on our understanding of the organization of the brain, the functional selectivity of low-level cortices, and plasticity across the lifespan. Across studies we have used combinations of psychophysics, ERPs, fMRI and TMS, taking advantage of innovations in signal processing to yield greater mechanistic interpretability of the data. Several general conclusions are supported by the collective data. First, (near) primary cortices are loci of multisensory convergence and interactions. Second, these effects occur at early latencies (i.e. <100ms post-stimulus onset). Third, these effects directly impact behaviour and perception. Fourth, multisensory interactions are context-contingent. One the one hand, they affect not only current stimulus processing, but also later unisensory recognition. Current unisensory (auditory or visual) object recognition and brain activity are incidentally affected by prior single-trial multisensory experiences; the efficacy of which is predictable from an individual's spatio-temporal dynamics of multisensory interactions. We then extend such findings across the lifespan to show how multisensory processes may be yoked together. Finally, examples of multisensory processes at the service of sensory substitution are presented. Together, these data underscore how multisensory research is changing long-held models of functional brain organization and perception in both health, across the lifespan, and in disease and its remediation

Host: Olivier Collignon

Il pensiero artificiale

When: mar, 15 novembre, 6:30PM – 7:30PM

*Where***:** Corso Bettini, 84, Rovereto, Province of Trento, Italy Palazzo Istruzione, Aula Magna

Speaker:
- Piergiorgio Odifreddi, Berkeley

Title: **Neuroscience & Society: Il pensiero artificiale**

Abstract: Il computer è stato concepito da Turing come un modello meccanico della mente. In seguito allo sviluppo teorico e pratico dell'informatica, soprattutto nel campo dell'Intelligenza Artificiale, oggi le carte si sono invertite e la mente si può considerare come un modello biologico del computer. Più in generale, si può sviluppare un'analogia tra hardware e software da un lato, e corpo e mente dall'altro, che può essere istruttiva e stimolante per entrambi i punti di vista, biologico e informatico.

Host: Louise Johanna Francisca Maria Van Zoest

CIMeC Colloquium

When: ven, 28 ottobre, 12PM – 1PM

*Where***:** Corso Bettini, 84, Rovereto, Province of Trento, Italy Palazzo Istruzioni, Sala Convegni

Speaker:
- Terrence W. Deacon**,** Professor, Department of Anthropology, University of California, Berkeley

Title: **Neither nature nor nurture: the semiotic basis of language universals**

Abstract: The concept of a "universal grammar" has been hotly contested over the past half century. What is the source of the many highly convergent language structures in the world's many diverse languages? The usual lines of debate divide along nature/nurture lines: e.g. commonalities due to innate evolved cognitive predispositions or due to common discourse demands that become cultural conventions. But nature and nurture do not exhaust the possibilities. Many language universals are analogues to mathematical universals.

These universal grammatical constraints are effectively "discovered" in the history of linguistic evolution, language change, and during process of language acquisition due to pragmatic feedback about failed or ambiguous reference. And many of the most critical semiotic constraints are discovered in prelinguistic and extralinguistic iconic and indexical communication. This makes both innate grammatical knowledge and the so-called poverty of the stimulus problem irrelevant.

Seminar

When: mar, 18 ottobre, 2:30PM – 3:30PM

Where: CIMeC Corso Bettini 31 Fedrigotti 3rd floor seminar

Speaker:
- Stefan Van der Stigchel, Associate professor at Universiteit Utrecht

Title: **Visual stability across saccades**

Abstract: As the neural representation of visual information is initially coded in retinotopic coordinates, eye movements (saccades) pose a major problem for visual stability. If no visual information were maintained across saccades, retinotopic representations would have to be rebuilt after each saccade. It is currently strongly debated what kind of information (if any at all) is accumulated across saccades, and when this information becomes available after a saccade. In this talk, I will provide evidence that presaccadic information is used to facilitate postsaccadic perception, in support of a forward model of transsaccadic perception, aiming at anticipating the consequences of eye movements and operating within the narrow perisaccadic time window. In a second line of research, we tested the role of visual working memory in maintaining visual stability using a dual task. Our studies indicate that visual continuity is dependent on visual working memory and that information that is relevant for maintaining visual continuity is prioritized over the current content of visual working memory.

Host: Louise Johanna Francisca Maria Van Zoest

Seminar

When:

Wednesday 21/9: 2 - 3.30 pm

Wednesday 28/9: 2 - 4:30 pm

Wednesday 05/10: 2 - 4:30 pm

Wednesday 12/10: 2 - 3.30 pm

Where: CIMeC Corso Bettini 31 Fedrigotti 3rd floor seminar

Speaker:
- CIMeC's Visiting Professor, Prof. Michael Waldmann
- Georg-Elias-Müller-Institute for Psychology, Cognitive and Decision Sciences University of Goettingen, Germany

Title: **Models of Causal Reasoning**

Abstract: Causal reasoning is a central cognitive competency, enabling us to adapt to our world. Yet causal reasoning has been curiously absent from mainstream cognitive psychology until recently. The situation has slowly changed in the past two decades leading to a number of competing theories of causal cognition. The goal of the lectures is to present recent research demonstrating the progress in this research area. It will provide an overview of competing theories of causal reasoning, including associative accounts, causal Bayes nets, and force dynamics, and discuss experiments testing these theories.

Host: Katya Tentori

When: mer, 21 settembre, 11AM – 12PM

Where: ACN lab - seminar room II floor, piazza della Manifattura 1 - Building n.14

Speaker:
- prof. Ivan Colagè, Faculty of Philosophy, Pontifical University Antonianum, Rome

Title: **Cultural Evolution and its Possible Mechanisms: Neuroscience, Archeology and Pedagogy**

Abstract: Recent achievements in the fields of neuroscience and pre-historical archaeology emphasize the importance of cultural evolution to understand the process leading to the present-day bio-cognitive and socio-cultural conformation of Homo sapiens. The challenge is now to unveil the possible mechanisms characterizing cultural evolution as well as the analogies and differences with biological evolution and natural selection. The point is in trying to elaborate a conceptual framework capable of acknowledging the specificities of cultural evolution without untying it from biological evolution.

I will first focus on the notion of "cultural neural reuse", which points to the idea that the neural substrates underpinning key cultural practices (such as writing or arithmetic) may have emerged not as a direct result of biological evolution but as the outcome of the canalized exploitation of neural plasticity.

Then, I will present archaeological evidence suggesting that the temporal pattern of cultural innovations (many of them appearing, disappearing, and reappearing in different places, at different times, within different populations – not only sapiens – and with varied specifics) is incompatible with the conviction that biological evolution must always and necessarily precede (and/or cause) the emergence of cultural innovations.

Finally, I will propose some hypotheses on how cultural innovation, cultural neural reuse, and teaching strategies can act together in shaping the basic dynamics of cultural evolution, concluding with the idea that even some of the fundamental features of articulate language might have emerged, especially in the latest stages, through cultural evolution rather than because of biological evolution. Cultural Evolution and Its Possible Mechanisms: Neuroscience, Archaeology and Pedagogy

Host: Giorgio Vallortigara

When: ven, 2 settembre, 11AM – 12PM

Where: ACN lab - seminar room II floor, piazza della Manifattura 1 - Building n.14

Speaker:
- prof. Ivan Colagè, Faculty of Philosophy, Pontifical University Antonianum, Rome

Title: **Wein Chen on Pupil dilation reveals latent decision processes in value-based choice**

Abstract: Recent achievements in the fields of neuroscience and pre-historical aciunrchaeology emphasize the importance of cultural evolution to understand the process leading to the present-day bio-cognitive and socio-cultural conformation of Homo sapiens. The challenge is now to unveil the possible mechanisms characterizing cultural evolution as well as the analogies and differences with biological evolution and natural selection. The point is in trying to elaborate a conceptual framework capable of acknowledging the specificities of cultural evolution without untying it from biological evolution.

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Host: Giorgio Vallortigara

CIMeC Seminar

When: gio, 28 luglio 2016, 3PM – 4PM

*Where***:** Center for Mind/Brain Sciences (CIMeC), University of Trento, Corso Bettini, Rovereto, Province of Trento, Italy Conference room

Speaker:
- Philipp Schwedhelm

Title: **Towards understanding the cortical control of feature-based attention**

Abstract: A rapid and accurate identification of behaviorally relevant stimuli is often mediated by the deployment of attention. If target stimuli requiring a behavioral response are identified based on their stimulus features (e.g. their color or motion direction), feature-based attention enhancing searched-for features constitutes an efficient mechanism to quickly separate targets from distractors.

However, the cortical mechanisms subserving a rapid and voluntary deployment of feature-based attention are only poorly understood. We measured feature-based enhancements of single units in motion selective area MT of two macaque monkeys while animals performed a delayed match-to-sample task. Stimuli were identified as targets either based on their motion component, their color, or a conjunction of motion and color.

Target stimuli matching the searched for motion were enhanced by attention, but we also found significant modulations of firing rates when animals did not attend to the motion but the color of the stimuli. Here, the time-courses of the attentional modulation in area MT revealed latency differences between feature-based modulations; with attention to the primarily encoded feature occurring earlier in time. This finding is consistent with a theory of sequential activation of cortical modules and supports the notion of a unified, object-based attention system.

Further, when monkeys identified target stimuli based on a unique conjunction of color and motion, the observed modulation was not the sum of color- and motion-based matching tasks. Instead, we measured the biggest attentional effects for distractor stimuli matching either of the searched-for features, consistent with a role of area MT in signaling potential targets, rather than targets. This finding reveals a limit in the specificity of the feature-based attentional system and will serve as a tool for testing potential control areas involved in the deployment of attention. We also demonstrate a probable link between feature-based and object-based mechanisms of attention, with feature-based enhancement preceding object-based modulation.

Preparing for the challenge of unraveling the cortical control circuit underlying the deployment of feature-based attention, we performed psychophysical experiments with human subjects, putting the popular Normalization Model of Attention to the test. We used a behavioral task with transparent motion stimuli that forced subjects to deploy feature-based attention in order to reach a sufficient performance level. We then computationally linked human performance to the responses of putative neuronal populations, and were

successful in extending the Normalization Model to include the measured performance enhancements. Together, our results give an intuition about the nature of the feature-based modulatory signal, reaching extrastriate, visual cortex, presumably originating from prefrontal sources. The logical next step is the challenging task to map out prefrontal sources involved in the control of feature-based attention to ultimately unravel the cortical network subserving the deployment of attention.

Host: Daniel Baldauf

Seminar Series

When: gio, 28 luglio 2016, 11:00AM – 12:30PM, 1PM – 3PM

*Where***:** Center for Mind/Brain Sciences (CIMeC), University of Trento, Corso Bettini, Rovereto, Province of Trento, Italy 3rd floor seminar room

Transfer Learning Seminar

When: mer, 27 luglio 2016, 3PM – 4PM

*Where***:** Center for Mind/Brain Sciences (CIMeC), University of Trento, Corso Bettini, Rovereto, Province of Trento, Italy 1st floor seminar room

Speaker:
- Benedetto De Martino, Sir Henry Dale Senior Research Fellow, University of Cambridge

Title: **The construction of confidence in value-based judgments**

Abstract: Basic psychophysics tells us that decisions are rarely perfect: even with identical stimuli choice accuracy fluctuates and errors are often made. Metacognition allows appraisal of this uncertainty and correction of errors. For more complex value-based decisions (also known as economic decisions), however, metacognitive processes are poorly understood. In particular, how subjective confidence and valuation of choice options interact at the level of brain and behaviour is unknown. In this talk I will present recent work we conducted in my lab to investigate this relationship (combining psychophysics paradigms, computational modelling and neuroimaging tools). The aim of this approach is to provide new links between uncertainty in value computation and reports of confidence. I will also show how humans can use their metacognitive awareness to correct future decisions and how confidence evolves during value-based learning.

Host: Giorgio Coricelli

ATTEND Seminar

When: mer, 27 luglio 2016, 11AM – 12PM

*Where***:** Center for Mind/Brain Sciences (CIMeC), University of Trento, Corso Bettini, Rovereto, Province of Trento, Italy, 3rd floor seminar room

Speaker:
- Christoph Huber-Huber, Department of Basic Psychological Research and Research Methods, University of Vienna, Austria

Title: **Using temporally aligned event-related potentials for the investigation of attention shifts prior to and during saccades**

Abstract: According to the pre-motor theory of attention, attention is shifted to a saccade's landing position before a saccade is executed. Such pre-saccadic attention shifts are usually studied in psychophysical dual-task settings consisting of a saccade task and a discrimination task carried out before saccade onset. Here, we present a novel single-task approach to investigate pre-saccadic attention shifts with the help of

combined eye-tracking and event-related potentials (ERPs). This single task has the advantage to avoid artificially prolonged saccade latencies due a secondary task. Participants executed one or two saccades to color-defined targets while ERPs and eye-movements were recorded. In single-target blocks, participants executed a single saccade. In two-target blocks participants made either a single saccade to one of the targets, or two successive saccades to both targets. Importantly, in two-target blocks, targets could appear on the same or on opposite sides of the vertical midline, providing additional insights into the parallel allocation of attention. We temporally aligned EEG data simultaneously to stimulus onset and saccade onset to inspect eye-movement-artifact free contra-to-ipsilateral ERP differences (akin to components like the N2pc or posterior contralateral negativity [PCN]) prior to saccade onsets. Significant contra-to-ipsilateral differences within 100 ms before the saccade indicated attentional selection of the relevant target before saccade onset. Greater contra-to-ipsilateral differences for two same-side than for opposite-side targets suggested parallel selection of both saccade targets prior to the onset of the first eye movement. However, contra-to-ipsilateral differences were the same for one target and same-side target conditions. I will explain the implications of the results for the role of attention during saccade preparation, and present the design of a follow-up study targeting specifically the influence of an additional discrimination task on attentional allocation before saccade execution. I will also point out how temporally aligned ERPs compare to independent-component analysis (ICA) based correction of the electroencephalogram (EEG) for eye-movement artifacts.

Host: David Melcher

Transfer Learning Seminar

When: mar, 26 luglio 2016, 3PM – 4PM

Where: Center for Mind/Brain Sciences (CIMeC), University of Trento, via delle Regole 101 Mattarello
Conference Room

Speaker:
- Carlo Reverberi, Assistant Professor, Department of Psychology, Università Milano-Bicocca

Title: **Coherent pattern detection on ~10-volume long fMRI data**

Abstract: Short-term, transient interactions between brain areas might play a fundamental role in cognition. Uncovering these interactions is important to understand normal and pathological brain function. Short-term interactions can be difficult to detect, as they may be rapid, idiosynchratic, unrepeatable, not synchronized with external events. Common fMRI analysis methods are not optimal: while model-driven methods require synchronization with external events, data-driven methods suffer from severe artifacts. We need methods that are sensitive and clean enough to identify interesting signal in a single subject and short time windows.

We have developed Coherence Density Peak Clustering (CDPC), a data-driven fMRI analysis method aimed at detecting coherent activity patterns. Applying CDPC to both simulated and real data, we have shown that it is able to recognize genuine signal in short time windows and single subjects, with better performance compared to a common method (ICA). CDPC can highlight the presence of correlations between distant brain areas and opens the way to the study of short-time brain network dynamics.

Host: Giorgio Coricelli

Transfer Learning Seminar

When: mar, 26 luglio 2016, 11AM – 12PM

Where: Center for Mind/Brain Sciences (CIMeC), University of Trento, via delle Regole 101 Mattarello
Conference Room

Speaker:
- Doris Pischedda, Bernstein Center for Computational Neuroscience, Berlin

Title: **Neural representations of task sets: from the individual to interacting people**

Abstract: In everyday life, humans perform various tasks, such as moving a sofa to a different room or preparing a tray of lasagna. Such tasks can be described in terms of the rules that specify how to perform the task (e.g. the instructions in the lasagna's recipe). Task rules can be of different nature (e.g., rules defining different types of associations) and structured in different ways (e.g., in a hierarchy), depending on the complexity of the task. While some tasks can be performed by a single individual, more complex tasks require interaction with other people, like when one has to move a sofa to another room. But how are tasks rules represented and processed in the brain? Are different rules encoded by distinct brain structures? Do task representations change when we perform a task with other people? In this talk, I will present some of my studies investigating how different task rules are represented and processed in the human brain. Specifically, I considered rule sets comprising either different types of rules (e.g., conjunctive, disjunctive, or conditional rules) or rules organized in a hierarchy (with concrete low-level stimulus-response rules and more abstract high-level section rules) to identify neural representations of such task rules. Task encoding was also explored in situations where different people have to coordinate their actions to achieve a common goal, to identify neural representations of tasks that are performed by the subject or by their partner. Our results showed that task rules were encoded by multiple brain regions within the frontoparietal control network, with no difference depending on either the type of rule or the hierarchical level the rule belonged to. However, we did find some differences in brain activity related to the processing of the various types of rules, suggesting that rule encoding depends on task phase. Moreover, different frontal and parietal regions encoded information about the identity of a task assigned to either the subject or their partner and about who performs a specific task, suggesting that task ownership determines how information is represented across the brain.

Host: Giorgio Coricelli

Seminar Series

When: mar, 26 luglio 2016, 11AM – 1PM

*Where***:** Center for Mind/Brain Sciences (CIMeC), University of Trento, Corso Bettini, Rovereto, Province of Trento, Italy 3rd floor seminar room

Transfer Learning Seminar

When: gio, 21 luglio 2016, 4PM – 5PM

*Where***:** Center for Mind/Brain Sciences (CIMeC), University of Trento, via delle Regole 101 Mattarello Conference Room

Speaker:
- Vasilisa Skvortsova, Laboratoire de Neurosciences Cognitives, Inserm research unit 960, Département d'Etudes Cognitives, Ecole Normale Supérieure, Paris, France

Title: **Learning flexibility in response to the correlation structure of choice alternatives**

Abstract: Learning from trial-and-error has been well characterized at the behavioral, computational and neurobiological levels, and shown to play an important role in human decision-making. However, the extent to which the underlying reinforcement learning process adapts to long-term correlations in the environment remains unclear. While learning rates adapt to the overall volatility of choice-outcome contingencies during reversal learning, do learning rules change depending on the presence or absence of the correlations between choice alternatives?

In a series of experiments, we asked healthy subjects to play a repeated two-armed bandit game where: a) rewards which could be obtained from the two levers were either uncorrelated or anti-correlated over time, and b) rewards from the unchosen lever on each trial were either shown or hidden (complete or partial feedback information), in which case they could only be inferred. This design allowed us to ask two questions. First, do subjects apply the same learning scheme when they have to infer, rather than observe,

the reward from the unchosen lever? Second, do subjects adapt this 'fictive' learning process to the correlation between rewards from the two levers?

In the first experiment (N = 30), participants were explicitly informed about the correlational structure of the two levers prior to each learning block. In the second experiment (N = 29) no explicit information was given and subjects had to detect whether the outcomes were correlated over time while playing the game.

In both experiments Bayesian model selection revealed that subjects applied different learning schemes in complete and partial feedback conditions, and adapted learning rules depending on the presence or absence of reward correlation between levers. When both chosen and unchosen rewards were shown, a reinforcement learning scheme which tracks the relative preference for one lever over the other outperformed learning schemes using separate value representations of the two levers (exceedance probabilities in both experiments pexc > 0.999). The opposite pattern was observed in the partial feedback condition, where a learning scheme which tracks the absolute values of the two levers better accounted for the human data (both pexc > 0.95). In this condition, subjects adopted a 'normalization' learning rule by updating the value of the unchosen lever with the negative prediction error for the chosen lever when rewards from the two levers were anti-correlated, and a 'regression-to-the-mean' learning rule when rewards were uncorrelated (anti-correlated: pexc ≈ 0.88 and pexc ≈ 0.98, uncorrelated: pexc ≈ 0.89 and pexc ≈ 0.93 for experiments 1 and 2). This flexible adjustment of the learning scheme was observed on top of the stable preference of the subjects towards either of the two learning schemes and correlated positively with the performance.

In both experiments, model-free analyses revealed different weighting of the previously experienced outcomes as a function of the environmental correlation when making a decision to switch the response on the next trials. Transient changes in pupil diameter in response to chosen and unchosen outcomes also encoded the information about the the task structure. Together, these findings show that human subjects are capable of both detecting the correlation structure of their environment and adjusting to it through fictive learning rules. This 'computational flexibility' has important implications for real-life economic environments (e.g., stock markets) which feature complex correlation structures.

Host: Giorgio Coricelli

When: gio, 21 luglio 2016, 11AM – 12PM

*Where***:** Center for Mind/Brain Sciences (CIMeC), University of Trento, via delle Regole 101 Mattarello Conference Room

Speaker:
- Bastien Blain, PhD student at the Brain & Spine Institute (ICM), Paris and Paris Panthéon-Sorbonne University

Title: **Executive Fatigue and Choice Impulsivity**

Abstract: While we understand quite well why muscles ache after prolonged exercise, the origins of mental fatigue still appear mysterious. Existing theories remain at a psychological level, with scarce supporting evidence. I will present a series of studies supporting that:

1)   Fatigue develops over much longer time scales (from hours to weeks) than usually explored, and in severe cases results in major health issues known as overtraining or burnout syndromes;

2)   Fatigue arises from the prolonged use of a specific brain system dedicated to executive control, in the lateral prefrontal cortex;

3)   Fatigue may not manifest as performance decrease with time-on-task but as a bias in unrelated choices (impulsivity in intertemporal choice), due to a lack of executive control during decision-making;

4)   Fatigue is not directly linked to subjective stress or hunger;

5)   Decision-making can be used to evaluate executive fatigue in real world situation, for example when medical students are preparing their exams over a several hour work session.These findings might help to prevent both daylong cognitive work from biasing economic decisions and burnout syndromes.

Host: Giorgio Coricelli

Transfer Learning Seminar

When: lun, 18 luglio 2016, 11AM – 12PM

Where: Center for Mind/Brain Sciences (CIMeC), University of Trento, via delle Regole 101 Mattarello Conference Room

Speaker:
- Giuseppe Attanasi, Associate Professor - Director of LEES (Laboratory of Experimental Economics of Strasbourg), University of Strasbourg

Title: **Disclosure of Belief-Dependent Preferences in a Trust Game**

Abstract: Experimental evidence suggests that agents in social dilemmas have belief-dependent, other-regarding preferences. But in experimental games such preferences cannot be common knowledge, because subjects play with anonymous co-players. We address this issue theoretically and experimentally in the context of a trust game, assuming that the trustee's choice may be affected by a combination of guilt aversion and intention-based reciprocity. We recover trustees' belief-dependent preferences from their answers to a structured questionnaire. In the main treatment, the answers are disclosed and made common knowledge within each matched pair. Our main auxiliary assumption is that such disclosure approximately implements a psychological game with complete information. To organize the data, we classify subjects according to their elicited preferences, and compare predictions for the complete-information model (main treatment) with robust qualitative predictions for the incomplete-information model (control).

Host: Giorgio Coricelli

Transfer Learning Seminar

When: mar, 12 luglio 2016, 4PM – 5PM

Where: Center for Mind/Brain Sciences (CIMeC), University of Trento, via delle Regole 101 Mattarello Conference Room

Speaker:
- Joshua Miller, Assistant Professor, Bocconi University, Department of Decision Sciences, Milano

Title: **Tra i Leoni: An Economic Measure of Superstitious Belief**

Abstract: Superstitious beliefs are widespread. Superstitious beliefs often generate stark behavioral patterns, suggesting that they may also have a meaningful impact on economic behavior. To have a economically meaningful impact, it is necessary that a superstition be strongly held. We identify a naturally occurring superstition that generates a stark and nearly universal behavioral pattern, yet whose strength is amenable to measurement. We design two field experiments and a laboratory experiment in order to determine if people are willing to incur a cost (qualitative and quantitative) to behave in accordance with their superstition, and if so, to also identify whether social conformity, rather than superstitious belief per-se, can explain their behavior.

Host: Giorgio Coricelli

When: mar, 05 luglio**,** 4:00 PM-5:30 PM

*Where***:** Center for Mind/Brain Sciences (CIMeC), University of Trento, via delle Regole 101 Mattarello Conference Room

Speaker:
- Eve Fabre, Institut Supérieur de l'Aéronautique et de l'Espace (ISAE) of Toulouse, France

Title: **The impact of hierarchy on decision-making in the field of military and aeronautics**

Abstract: Both military and aeronautical environments are based on strong hierarchical systems. Co-pilots as well as soldiers are expected to follow the orders of their line managers. This sometimes has very negative consequences in that it is likely to jeopardize safety in the aircraft or cause personal distress to soldiers. In the first part of the talk, I will present the early results of an EEG/fNIRS study investigating the impact of hierarchy on decisions made in a military moral dilemma context. Participants were acting as drone pilots and in each trial, the drone they piloted suffered damage. They had to choose the best place to crash between a "civilian site" where civilians were standing, and a "military site" with military facilities/equipment that were void of people (i.e., soldiers and civilians). In the first part of the experiment, participants were given no rule and had to choose the crash site according to their own preferences. However, in the second part of the experiment, they were explained that their mission was to protect military sites. Lower central PFC activations were found when participants chose to follow the immoral rule (i.e., sacrificing civilians) compared to when they chose to disobey (i.e., not killing individuals). Choosing to disobey an order given by a line manager may have a greater "emotional cost" than obeying it, which may explain why some individuals are likely to follow bad orders rather than oppose it. In the second part of this talk I will present three experiments composing my postdoctoral project aiming at testing how hierarchy impacts decisions and risk taking in the cockpit.

Host: Giorgio Coricelli

When: ven, 24 giugno, 10:30 – 11:30

Where: P. Fedrigotti, 1st floor conference room

Speaker:
- Valeria della Maggior Department of Physiology, School of Medicine, University of Buenos Aires, Argentina

Title: **Motor memory formation: what have we learned from longitudinal studies conducted at different time scales**

Abstract: Previous studies suggest that learning two similar motor tasks leads to long-lasting anterograde interference (Miall et. al., 2014; Caithness et. al., 2014; Krakauer et. al., 2005, Krakauer 2009). In this talk, I will present evidence indicating that anterograde effects may lead to interference or facilitation depending on the time interval elapsed between tasks.

Host: Jorge Jovicich

When: mar, 21 giugno, 15:30 – 16:30

Where: 1st floor conference room CIMeC Corso Bettini 31 Rovereto

Speaker:
- Roy Mukamel, Ph.D. Associate Professor in the School of Psychological Sciences, and Sagol School of Neuroscience Tel-Aviv University

Title: **Neural circuits mediating transfer of motor knowledge**

Abstract: Visual input of actions has been shown to evoke significant activity in neural circuits of the motor pathway (mirror neuron system). During my talk, I will demonstrate that visual input of actions that are non-consciously perceived, still elicits significant neural activity in the mirror neuron system. Additionally, observation of consciously perceived actions elicits implicit subsequent changes in behavior which can be predicted from neural activity during observation. Moreover, we see differential behavioral and neural effects during action observation for the explicit purpose of learning that depend on the identity (right/left) of observed hand. Finally, I will describe a novel virtual-reality setup we developed in the lab which yields efficient performance gains in a limb that is not engaged in physical training. Together, these results have implications for efficient motor skill learning and rehabilitation of patients with hemiparesis and may explain behavioral phenomenon such as the Chameleon effect.

Host: Luca Turella

Seminar

When: mer, 15 giugno, 10:00 – 11:00

Where: Corso Bettini, 31, Rovereto, Province of Trento, Italy 1st floor conference room

Speaker:
- Massimo Piattelli-Palmarini Professor of Cognitive Science Department of Linguistics University of Arizona

Title: **Multiple takes on de se: On referring to oneself (in different languages)**

Host: Giorgio Vallortigara

CIMeC Talk

When: mer, 1 giugno, 11:00 – 12:00

Where: ACN lab - seminar room II floor, piazza della Manifattura 1 - Building n.14

Speaker:
- Prof. Mauro Mandrioli, Associate Professor in Genetics Laboratory of Insect Genetics and Biosciences (IGB), Dept. Life Sciences

Title: **Microbial symbionts: a new resource for the management of insect-related problems**

Abstract: Symbiosis involving insects and microorganisms is of high relevance for their ecology and evolution. Indeed, several advantages are provided by symbionts to their hosts, affecting their capability to occupy different ecological niches, to be protected by natural enemies or to face environmental stresses. In the light of their importance, these interactions may be exploited for the management of insect-related problems, such as pest diffusion, spread of insect-borne diseases, or infection of useful insects by pathogens. Control strategies against pathogens and pests in agriculture and biomedicine have been already proposed for several models making symbiosis a new tool for pest insect management.

Host: Giorgio Vallortigara

CLIC research colloquium

When: gio, 19 maggio, 4PM – 6PM

Where: Corso Bettini, 31, Rovereto, Province of Trento, Italy 3rd floor seminar room

Speaker:
- Kees van Deemter, University of Aberdeen, UK.

Title: **Computational Models of Referring**

Abstract: In this talk I will, firstly, try to assess the state of the art of the computational Generation of Referring Expressions, viewed as the construction of computational models of human reference production; in this first part of the talk, I will ask what algorithms in this area are able to do well and what it is that they still struggle to do. In the second part of the talk, I will use evidence from experiments with human speakers and hearers to argue that the most difficult problems in this area arise from situations in which reference is something other than the "simple" identification of a referent by means of knowledge that the speaker shares with the hearer; I will give examples of these epistemically problematic situations, and of the generation algorithms that address them. -- The talk offers a sneak preview of my book "Computational Models of Referring: A Study in Cognitive Science" (MIT Press, May 2016).

CIMeC Talk

When: lun, 16 maggio, 10AM – 11AM

Where: ACN lab - seminar room II floor, piazza della Manifattura 1 - Building n.14 (mappa)

Speaker:
- Hans-Joachim Bischof, University of Bielefeld, Germany

Title: **The Role of Smelling and the Nucleus Taeniae of the Amygdala (TnA) on Social Behaviour of Zebra Finches.**

Abstract: Since it is confirmed that the avian nucleus taeniae of the amygdala (TnA) is homologue to the medial amygdala in mammals, it has gained interest of researchers dealing with the neural control of social behavior. I shall present some experiments with zebra finches on the role of TnA at controlling social behaviour, on the development of this nucleus and its connections. I also present some experiments concerning the role of odour for social recognition in zebra finches, and finally speculate about what the investigations on TnA function might have to do with those on smelling in zebra finches.

Host: Giorgio Vallortigara

Transfer-Learning Seminar

When: gio, 12 maggio, 11:00AM – 12:30PM

Where: CIMeC via delle regole 101, Mattarello Conference room

Speaker:
- Leonidas Spiliopoulos, Max Planck Institute for Human Development Berlin

Title: **A process analysis of heuristics use in games under time constraints**

Host: Giorgio Coricelli

CIMeC Seminar

When: lun, 9 maggio, 3PM – 4PM

Where: CIMeC Corso Bettini 31 Rovereto 1st floor conference room

Speaker:
- Sara Fabbri, Postdoctoral fellow at the Donders Institute for Brain, Cognition, and Behaviour, Radboud University, Nijmegen

Title: **Neural correlates of real actions: grasping and swiping**

Host: Simona Monaco

Seminar

When: mer, 4 maggio, 3PM – 4PM

Where: CIMeC Corso Bettini 31 Rovereto 1st floor conference room

Speaker:
- Claudia L. R. Gonzalez, Canada Research Chair, University of Lethbridge, Alberta, Canada

Title: **Towards a theory of sensory and cognitive specialization**

Abstract: One of the oldest and most intriguing puzzles in behavioral neuroscience is the nature of localization of function, the extreme case being lateralization of function. In 2016, we know that the neural processes underlying motor control, language, haptic processing, and spatial abilities are lateralized, but how and why these functions are lateralized remains a scientific mystery. Indeed, we still do not know exactly what is lateralized, nor how lateralized functions relate more generally to sensory inputs (e.g. visual versus haptic) or cognition. One of the goals of my research program is to determine if hemispheric specializations for sensorimotor control served as a platform for the later development of cognitive specializations. For example, is the left hemisphere specialization for visuomotor control related to the left hemispheric specializations underlying language? Similarly, is the right hemisphere specialization for haptic control associated with this hemisphere's specialization for spatial processing? In this talk I will present data supporting these speculations. Specifically, I will draw parallels between hemispheric specializations for sensorimotor control and cognitive abilities by highlighting the relationship between hand-to-mouth actions and language.

Host: Simona Monaco

Funds: FIRB 2013 to Luca Turella

MADVIS Seminar

When: mar, 26 aprile, 11AM – 12PM

Where: CIMeC Corso Bettini 31 Rovereto 1st floor conference room

Speaker:
- Lotfi Merabet, Director of the Laboratory for Visual Neuroplasticity Massachusetts Eye & Ear Infirmary, Associate Professor of Ophthalmology Harvard Medical School

Title: **Comparing Neuroplastic Changes in the Brain of Individuals with Ocular versus Cortical Causes of Visual Impairment**

Abstract: Within the setting of visual deprivation, the brain undergoes dramatic reorganization in both its structure and function. Furthermore, these neuroplastic changes are intimately related to compensatory sensory and perceptual behaviors observed in individuals who are blind. We will present how modern neuroimaging has helped reveal the relationship between the brain and behavior as it relates to blindness,

and highlight differences between individuals who are visually impaired due to ocular causes as compared to those who have developmental damage to the visual cortex.

Host: Olivier Collignon

This talk is carried out within the framework of MADVIS, an ERC-funded project.

CLIC Seminar

When: gio, 21 aprile, 1PM – 2PM

Where: 3rd floor seminar room, CIMeC, Palazzo Fedrigotti, (Corso Bettini 31, Rovereto)

Speaker:
- Mariella Dimiccoli, Computer Vision Center, Universitat Autonoma de Barcelona

Title: **Towards storytelling from visual lifelogging**

Abstract: Visual lifelogging consists of acquiring images that capture the daily experiences of the user by wearing a camera over a long period of time. The collected data, commonly called visual lifelogs, offer considerable potential for inferring knowledge about a person's life and hence enable many applications such as contrasting dementia by cognitive training based on digital memories and monitoring lifestyle for the prevention of noncommunicable diseases. However, visual lifelogs present a significant challenge for automatic visual analysis, mainly due to the free motion and to the low frame rate of the camera (up to 2 pictures per minute), and to the nonintentional nature of the images. Furthermore, the sheer number of data that a visual lifelog consists of and the rate at which they increase (up to 2,000 images per day) imposes a need for efficient methods to extract and locate relevant content. In this talk, I will discuss recent results (and some ongoing work) on the automa tic analysis of visual lifelogging. In particular, I will focus on the problems of 1) event representation, 2) activity recognition and 3) visual question answering, for which the use of language processing would be highly beneficial, if not necessary.

Seminar

When: gio, 21 aprile, 10AM – 11AM

Where: ACN lab - seminar room 2nd floor, piazza della Manifattura 1 - Building n.14 Borgo Sacco

Speaker:
- Alan M. Leslie, Distinguished Professor of Psychology and Cognitive Science, Rutgers University Center for Cognitive Science, USA.

Title: **Keeping track of objects in the first year of life**

Host: Giorgio Vallortigara

Talk

When: mar, 19 aprile, 4PM – 5PM

Where: Corso Bettini, 31, Rovereto, Province of Trento, Italy 1st floor conference room

Speaker:
- SP Arun, IISc Bangalore, India

Title: **If we can make computers play chess, why can't we make them see?**

Abstract: If we can make computers play chess, Jeopardy and even Go, then why can't we make them see like us? This is a particularly perplexing question when we consider how easy we find the act of seeing which we perform countless times each day with virtually no errors. What makes vision such a hard problem? How does the brain accomplish vision? To answer these questions, we perform behavioral tests of vision in humans as well as recordings from neurons in the visual cortex of monkeys. I will describe some of our recent findings elucidating object recognition at the behavioral and neuronal level.

Bio: SP Arun received his B. Tech from IIT Bombay, and MS & PhD from Johns Hopkins University, all in Electrical Engineering. He completed his postdoctoral research at Carnegie Mellon University and joined the Centre for Neuroscience at IISc in 2010. His interests are in visual perception and object recognition.

Host: Marius Peelen

CIMeC Seminar

When: gio, 14 aprile, 11:00 – 12:30

Where: CIMeC, Corso Bettini 31 Rovereto 3rd floor seminar room

Speaker:
- Franco Pestilli, PhD, Indiana University

Title: **Precision brain science: Advances in connectome mapping for individual human brains**

Abstract: Magnetic resonance diffusion imaging and computational tractography are the only technologies that enable neuroscientists to measure white matter in the living human brain. In the decade since their development, these technologies revolutionized our understanding of the importance of the human white-matter for health and disease. There are good reasons to make these measurements in human. The human brain (1400 g) is 15 times the volume of the rhesus monkey (90 g), 700 times the volume of the rat (2 g) and 2,300 times the volume of the mouse brain (0.6 g). The human brain comprises of functionally specific clusters of maps communicating via an extensive network of long-range, myelinated, axonal projects. The size of the human brain imposes significant challenges for communicating across different regions
Prior to these technologies, the white matter was thought of as a passive cabling system. But modern measurements show that white matter axons and glia respond to experience and that the tissue properties of the white matter are transformed during development and following training. The white matter pathways comprise a set of active wires and the responses and properties of these wires predict human cognitive and emotional abilities in health and disease. We can now predict confidently that to crack the neural code in mapping the human brain, neuroscientists will have to develop an account of the connections and tissue properties of these active wires. Whereas there are many impressive findings, it is widely agreed that there is an urgent need to keep developing and improving tractography methods. The need for a systematic approach to tractography validation and for a framework to perform statistical model testing in individual brains has been claimed (Pestilli Nature: Scientific Data 2015).
First, I will present new framework for performing tractography evaluation and statistical inferecne on the network of brain connections (Pestilli et al., Nature Methods 2014). Second, I will introduce recent advances in methods for mapping human connectomes in living individuals (Takemura et al., PLoS computational Biology 2016). These new methods improve current techniques in fundamental ways and can be applied to any type of diffusion data. Finally, I will briefly show that by using the methods we were able to identify a major white-matter pathways previously unreported in the human brain. Such as sensory-motor integration (Takemura et al., Cerebral Cortex 2015; Yeatman et al., PNAS 2014), object-perception (Gomez et al., Neuron 2015) and decision making related pathways (Leong et al., Neuron 2016).
Videoconferencing available

Host: Paolo Avesani

CIMeC Seminar

When: ven, 18 marzo, 15:00 – 16:00

Where: Corso Bettini, 31, Rovereto, Province of Trento, Italy 1st floor

Speaker:

- Kenneth Valyear, Lecturer at Bangor University

Title: **Hand and Brain: The cognitive neuroscience of human hand function**

Abstract: Exquisitely designed for function, our hands enable us to literally reshape the world around us. When brain or bodily injury impairs our ability to use our hands, their pivotal role in upholding our independence and quality of life is made painfully clear. The purpose of my research is to better understand the neural basis of human hand function. In this talk I review fMRI data from a series of experiments that span three conceptual themes of ongoing interest in my lab: (1) action selection, (2) the neural specification of action possibilities, and (3) experience-dependent brain plasticity. First, I present evidence that parts of posterior parietal cortex represent action plans in hand-specific terms. Second, I present evidence that anterior intraparietal and premotor brain areas represent visual information as action possibilities, and that these representations are shaped by prior knowledge and experience. I discuss these two sets of findings together, and advance the hypothesis that action selection and the sensory specification of action possibilities involve some of the same neural machinery that is responsible for the online guidance and control of actions. Finally, I share newer brain imaging data related to grasping with a transplanted hand. The results reveal a similar functional brain organization related to grasping with a transplanted hand as is seen for grasping in healthy controls. These findings have positive rehabilitation implications, and suggest that grasp-related brain areas may provide suitable control signals for brain-machine interface technologies in patients with paralyses or limb loss.

Host: Simona Monaco

Funds: Luca Turella FIRB 2013

CIMeC Seminar

When: ven, 26 febbraio, 10:00 – 11:00

Where: Corso Bettini, 31, 38068 Rovereto TN, Italy (mappa)

Speaker:

- Ansuini Caterina - Post-Doc Fellow @ RBCS - Italian Institute of Technology

Title: **If what we want is in how we move: decoding action goals from kinematics**

Abstract: Is it possible to understand what others want by merely observing how they move? Based on the assumption that goals are hidden away in the other person's mind and therefore not accessible to perception, standard theories of social cognition have mainly focused on the contribution of higher level processes. Here I will delineate a new alternative approach to the intention-from-movement understanding problem in which a tight functional link between action execution and action observation is established. In doing this, I will first report on data from our lab that show to what extent and when, during action execution, goals shape movement kinematics. Then, I will provide evidence indicating that observers are sensitive to goal information conveyed by visual kinematics and can use this information to predict how an action would unfold. Finally, I will discuss about the implications these data might have in terms of how we know other minds and predict others' behavior.

Host: Luca Turella (funded by FIRB 2013)

MADVIS Seminar

When: gio, 11 febbraio, 10:00 – 11:00

Where: Corso Bettini, 31, Rovereto, Province of Trento, Italy 3rd floor seminar room (mappa)

Speaker:

- Gilles Vandewalle, FNRS Research Associate, University of Liège, Liège, Belgium .

Title: **Daily and yearly variations in neuronal function and their relationships with cognition and behavior**

Abstract: Wakefulness is associated with molecular/cellular/systemic changes in human brain function which are deemed to negatively impact cognition. The wake-related progressive performance decrement is however highly non-linear. Cognitive performance remains remarkably stable during a normal waking day, but undergoes abrupt degradation if wakefulness is extended into the biological night. This non-linearity reflects the influence of the circadian timing system, which counter sleep need during the day and favours sleep at night.
Results of recent study we conducted show that cortical excitability, a basic feature of brain function, changes with prolonged wakefulness, with a similar profile to cognitive performance variations, i.e. non-linearly. These changes in cortical excitability with prolonged wakefulness were associated to non-linear changes in excitation/inhibition balance, inferred in sillico through a data driven computational model (excitation/inhibition connectivity and glutamate/GABA receptor density balance).

These dynamics highlight novel aspects of the dual wake and circadian influence on brain function. However, beyond its daily regulation, brain function is also modulated by season. Animal data suggest that changes in the daily (circadian) dynamics of neuronal excitation/inhibition balance may contribute to seasonal adjustments within neuronal networks. Based on our data, we show that human the circadian profile in cortical excitability and GABA/Glutamate receptor density balance is indeed affected by season changes. These daily and yearly dynamics in neuronal excitability and in excitation/inhibition balance may represent some of the means though which the circadian machinery copes with wakefulness extension and season changes to maintain cognitive performance.

Host: Olivier Collignon

This talk is carried out within the framework of MADVIS, an ERC-funded project.

PREMESOR SEMINAR

When: gio, 21 gennaio, 11:00 – 12:00

Where: CIMeC - ACN laboratories, second floor, piazza Manifattura 1, Rovereto. (mappa)

Speaker:

- Dr. Marie HÉBERT, PhD in Neurosciences, University of Caen Lower--Normandy, France.

Title: **Molecular bases and factors influencing lateralization and spatial cognitive processes in the common cuttlefish (Sepia officinalis) and the house mouse (Mus musculus).**

Abstract: By allowing dual-brain processing of different kind of information simultaneously, cerebral lateralization has been shown to enhance brain efficiency in cognitive tasks. At the behavioural level, these anatomical or functional brain asymmetries often result in observable sensorimotor asymmetries, called behavioural lateralization. Even if it is now largely admitted that the level of cerebral and behavioural lateralization can vary from one individual to the other, only few studies have investigated the roles played by environmental pressures onto the development and expression of lateralization in animal species. Using as a model species the common cuttlefish, a cephalopod mollusc known to display visual lateralization, the

aim of my first study was therefore to investigate the impact of an exposition to different environmental pressures (i.e, predation and competition pressures) onto the development and expression of visual lateralization in juvenile cuttlefish.

Being able to orientate and navigate in the surrounding environment is a crucial point for survival of many animal species. During spatial navigation, visual information relative to environmental cues appeared to be highly used. So far, even if neuronal pathways underlying the cognitive processing of the different kind of visual cues available for spatial navigation have been extensively described is mammals, the molecular pathways involved remain still not fully understood. Therefore, the aim of my second study was to address the question of a possible differential involvement of the protein tissue-type Plasminogen Activator, a protein known to be involved in spatial learning, in the processing and use of distal versus proximal visual cues during spatial learning in mice, as well as to identify its mechanisms of action and molecular targets.

Host: Giorgio Vallortigara

The talk is carried out within the framework of PREMESOR, an ERC-funded project.

CIMeC Seminar

When: gio, 14 gennaio, 11:30 – 12:30

Where: Corso Bettini, 31, Rovereto, Province of Trento, Italy 3rd floor seminar room (mappa)

Speaker:

- Agustín Ibañez

1. Director, Institute of Translational and cognitive Neuroscience, INECO Fundation & CONICET, Favaloro University, Buenos Aires, Argentina.

2. Independent Researcher, National Scientific and Technical Research Council (CONICET), Buenos Aires, Argentina.

3. Co-Director, UDP-INECO Foundation Core on Neuroscience (UIFCoN), Diego Portales University, Santiago, Chile.

4. Associated Investigator, Centre of Excellence in Cognition and its Disorders, Australian Research Council (ACR), Sydney, Australia.

Title: **The Primacy of Body, Emotion, and Social Interaction in Psychiatric and Neurological Conditions**

Abstract: For more than half a century, cognitive science and neuroscience have envisioned human beings as radically disembodied entities guided by logical rationality and isolated from culture. However, these disciplines have recently provided novel alternatives proposing that action, body, emotion, and social interaction are characterized by situatedness. Here I will present relevant evidence from my laboratory, including behavioural studies of neurological and psychiatric disorders, intracranial recordings, lesion studies, high-density electroencephalography, neuroimaging, functional connectivity and meta-analysis studies. These convergent data suggest that the clinical and theoretical limitations of classical cognitive measures can be circumvented through ecological and situated tasks tackling body awareness, emotions, and social cognition in several disorders (frontotemporal degeneration, Huntington's and Parkinson's disease, focal lesions, developmental disorders, schizophrenia; ADHD; bipolar disorder). I will propose that these impairments are partially dependent on a broad fronto-insular-temporal network (FITN) responsible for (a) on-the-fly context-based prediction making, (b) coordination of the internal (bodily) and external (task-related) milieus, and (c) consolidation of associations between context and target stimuli. Then, I will show that in different disorders, deficits in disparate domains (e.g., interception, emotion recognition, empathy,

social decision-making, moral cognition) can be partially described as context-integration impairments triggered by aberrant activity of the FITN. Finally, I will discuss the new challenges implied in this new approach. In considering context as an intrinsic part of cognition, I will highlight the need for a situated approach to neuropsychiatric research, which stands in opposition to abstract, universal, and decontextualized perspectives. This joint venture between situated cognition, neuroscience and neuropsychiatry could fruitfully complement phenomenological and empirical approaches to psychiatry and neurology. (Partially supported by CONICYT/FONDECYT Regular 1130920; COLCIENCIAS 1115-545-31374 and 1115-569-33858; FONCyT -PICT 2012-0412, and 2012-1309; and the INECO Foundation.)

Host: Jorge Jovicich