APRIL
27

ENES Symposium
2023 Programme

ENES Bioacoustics Research Lab
Centre de Recherche en Neurosciences de Lyon

Université Jean Monnet Faculté des Sciences et Techniques, Bâtiment J (STAPS) Amphi J108, 23 rue Paul Michelon, 42023 Saint-Etienne

Thursday April 27, 2023, 9.30 - 17.30 h
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Schedule

9.30	**Welcome with Coffee**	
10.00	Nicolas Mathevon	Welcome and research talk: The voice of the Amazon
10.30	Florence Levrero	Current and future research on vocal communication in social mammals
10.45	Cédric Girard-Buttoz	Communicative function of chimpanzee vocal sequences
11.00	Vincent Arnaud & Christophe Coupé	How can we better exploit imperfect recording datasets? The bonobo call example
11.30	**Coffee Break**	
12.00	Kasia Pisanski	Can human listeners judge speaker traits from extremely short speech utterances?
12.15	Anna Terrade	Deterrence efficiency of ultrasonic frequency modulations in red deer (*Cervus elaphus*)
12.30	Floriane Fournier	Production of nonlinear acoustic phenomena is age-dependent in mandrills
12.45	Jules Brochon	Sense of smell in pinnipeds, is it really poorly developed?
13.00	**Lunch**	
14.30	David Reby	Beyond speech: Exploring diversity in the human vocal space
14.45	Romane Philippe	Effects of calming products on puppy distress whines (*Canis familiars*) in a separation context
15.00	Naïs Caron Delbosc	Multimodal perception of aquatic vibrations and airborne sound in crocodiles
15.15	Aitana Garcia Arasco	Do nonverbal vocalisations differ across human cultures?
15.30	Jeremy Rouch	Unsupervised exploration of the sound landscape of coral reefs
15.45	**Coffee Break**	
16.15	Siloé Corvin	Pain identification in human babies' cries: Neural correlates in expert adults
16.30	Théophile Turco	How noisy is the largest natural deep lake in France?
16.45	Xi Wang	Dynamics of food sensory alliesthesia during the day
17.00	Virgile Daunay	What does your laugh mean? Production and perception of context-specific volitional human laughter

Speakers & Abstracts

Nicolas Mathevon
ENES — Director

The voice of the Amazon

Having no cultural component, the songs of non-oscine passerines are thought to express variability that is primarily dependent on genetic drift. By studying the screaming piha, an emblematic bird of the Amazonian forest whose males sing in exploded leks, we show that vocal polymorphism can be expressed first at the individual level, allowing recognition between males and structuring of their communication network.

Florence Levrero
ENES — Associate Professor

Current and future research on vocal communication in social mammals

I will present the guidelines for my current and future research which notably explores the acoustic coding of various information in mammal vocalisations, the effect of the density of social networks on their communication, and vocal ontogeny across various mammal species.

Cédric Girard-Buttoz
ISC Marc Jeannerod — Postdoctoral fellow

Communicative function of chimpanzee vocal sequences

While language allows humans to communicate about a virtually infinite range of information through the combination of words into sentences, new meaning generation through the production of vocal sequences appears rather limited in non-human animals. I will present our recent results on the potential meanings of chimpanzee vocal sequences and show that these sequences likely dramatically expand the range of information that can be conveyed using only single calls.

Vincent Arnaud & Christophe Coupé

Invited speaker — Professor, Université du Québec à Chicoutimi

How can we better exploit imperfect recording datasets? The bonobo call example

Audio recordings of vocal interactions help us to understand what animals are saying, but scientists are often faced with datasets characterised by a limited number of mostly noisy and unbalanced recordings. Here, we report our new study (Arnaud et al., 2023 *PLOS Comput. Biol.*) highlighting recent machine learning advances applied to a Small, Unbalanced, Noisy, but Genuine (SUNG) dataset that succeed to unravel the complex vocal repertoire of the bonobo (*Pan paniscus*).

Katarzyna (Kasia) Pisanski

DDL & ENES — CNRS Researcher

Can human listeners judge speaker traits from extremely short speech utterances?

Nonverbal parameters of the human voice can communicate a remarkable amount of information about the speaker, from their sex and age to their physical attributes and personality. In a series of experiments, we show that listeners' voice-based judgments of speakers are highly stable, regardless whether they are basing their judgment on a single vowel sound or on longer bouts of scripted or spontaneous speech produced by the same speakers.

Anna Terrade

ENES, MNHN, SNCF — PhD student (D. Reby)

Deterrence efficiency of ultrasonic frequency modulations in red deer (*Cervus elaphus*)

Wildlife-vehicle collisions, especially with large mammals, are a major issue for transport companies. To evaluate efficiency of ultrasounds as deterrence signals, we ran a series of playback experiments on three ungulate species (*Cervus elaphus, Sus scorfa, Tayassu pecari*) and one carnivore species (*Canis lupus*). We show that while ultrasounds could in principle serve as deterrents, they are inefficient for our target species.

Floriane Fournier

ENES — Master student (F. Levrero)

Production of nonlinear acoustic phenomena is age-dependent in mandrills

Nonlinear phenomena (NLP) are frequent in mammalian vocalisations yet their functional value remains poorly understood. Here, we investigate potential changes in different types of NLP (deterministic chaos, sidebands, subharmonics, vibrato) produced at different ages in mandrills (*Mandrillus sphinx*), showing that the proportion of NLP decreases as emitter age increases.

Jules Brochon

ENES, NeuroPSI, Beauval Nature Association — PhD student (Gérard Coureaud & Isabelle Charrier)

Sense of smell in pinnipeds, is it really poorly developed?

Although pinnipeds have long been considered as having a poor sense of smell, our recent results show that California sea lions (*Zalophus californianus*) can discriminate between categories of odours both in air and under water. Using behavioural and experimental approaches, my PhD aims to better characterise the olfactory abilities of these marine mammals in their natural environments while determining processes that enable odour detection in aquatic environments.

David Reby

ENES — Professor

Beyond speech: Exploring diversity in the human vocal space

It has been suggested that human speech has led to the complexification of filter-related articulation (formants) at the expense of source-related modulation (pitch, intonation, NLP). Our data show that while speech indeed uses only a fraction of available source modulation, humans extensively modulate the source to produce a wide range of nonverbal vocal signals in everyday communication, singing, hunting, etc. Thus, speech production has not evolved at the expense of nonverbal vocal production.

Romane Phillipe

ENES, CEVA — PhD student (D. Reby, K. Pisanski, M. Massenet)

Effects of calming products on puppy distress whines (*Canis familiars*) in a separation context

In domesticated dogs, separation from owners or conspecifics can be stressful and ultimately lead to behavioural disorders. Products such as the Dog Appeasing Pheromone (DAP) and calming harnesses (Dog Anxiety) have been developed to alleviate the stress generated by these events. To assess the efficacy of these products, we monitored acoustic cues to emotional state in puppy distress whines produced during separation from litters.

Naïs Caron Delbosc

ENES, CRNL — PhD student (N. Mathevon, N. Grimault)

Multimodal perception of aquatic vibrations and airborne sound in crocodiles

We do not yet know to what extent crocodilians can integrate airborne sounds with vibrations on the water surface. To test this, we played back crocodile vocalisations using speakers and vibratory devices at variable spatial and temporal patterns. By studying the responses of young crocodiles to these audio-tactile stimuli, we test for possible dominance of one perceptual modality over another and for interactions between the two modalities.

Aitana Garcia Arasco

ENES — PhD Student (K. Pisanski, D. Reby)

Do nonverbal vocalisations differ across human cultures?

Nonverbal vocalisations such as cries and laughs are highly present in human social life. Although they are ubiquitous across diverse societies, it remains unknown the extent to which vocalisations differ across human populations and why. The aim of my PhD is to apply a comparative approach to test for factors contributing to variability in the acoustic structure and perception of vocalisations cross-culturally.

Jeremy Rouch

ENES — Postdoctoral fellow (F. Sèbe)

Unsupervised exploration of the sound landscape of coral reefs

For more than a year, the ENES laboratory has been collaborating with the Hubert Curien laboratory to develop machine learning tools for the exploration of natural sounds. We present here a first version of these tools and the results they will allow researchers to obtain, using an analysis example of a recording campaign of coral reef soundscapes.

Siloé Corvin

ENES, NeuroPain — PhD student (N. Mathevon, R. Peyron, C. Fauchon)

Pain identification in human babies' cries: Neural correlates in expert adults

Identifying that a baby's cry expresses pain actually requires learning through experience. Remarkably, parents of young babies are also able to identify the pain of an unfamiliar baby. Here we investigate the brain correlates of pain identification for familiar and unfamiliar babies in expert participants (parents and professional caregivers).
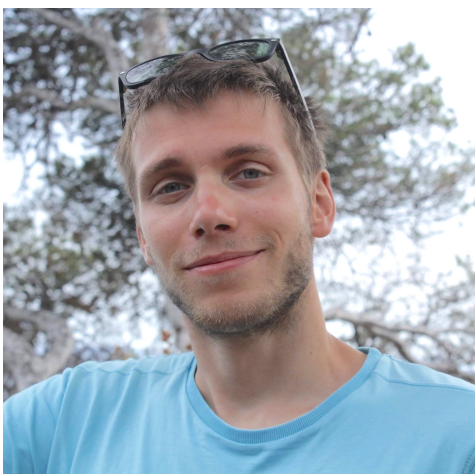
Théophile Turco

ENES — PhD student (V. Médoc, M. Beauchaud)

How noisy is the largest natural deep lake in France?

Anthropogenic (human-made) noise is one of the least visible but most widespread symptoms of human activities around the world. Its ecological impact and quantification on fresh waters remains under-investigated. In the largest natural lake in France, we assessed the phenology of noise pollution, calculated the increase in sound level and used unsupervised automatic approaches to characterise the diversity of artificial sounds.

Xi Wang

ENES, WakingTeam CRNL — PhD student (T. Jiang, C. Gronfier)

Dynamics of food sensory alliesthesia during the day

Research has shown that the sensory system plays a key role in controlling food intake. Food sensory alliesthesia (FSA), altering reward responses based on internal metabolic states, is one such sensory mechanism. Here, we measured sensory responses to food before and after a meal over 5 days. Our preliminary results show that FSA is not stable throughout the day and that the amplitude of FSA correlates with changes in hunger and satiety interoception.
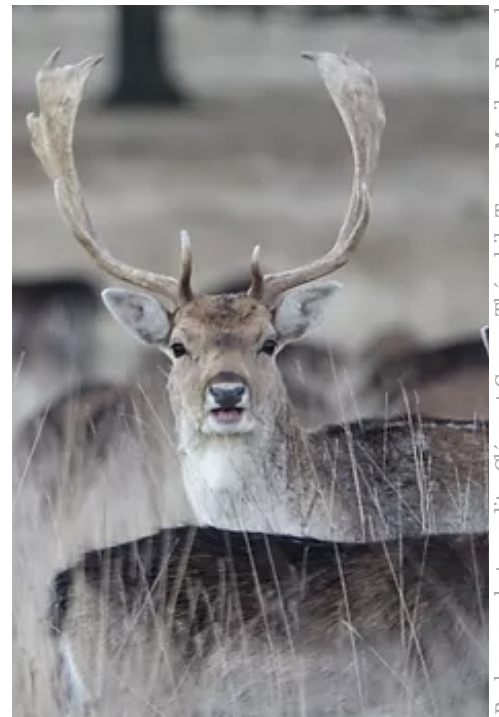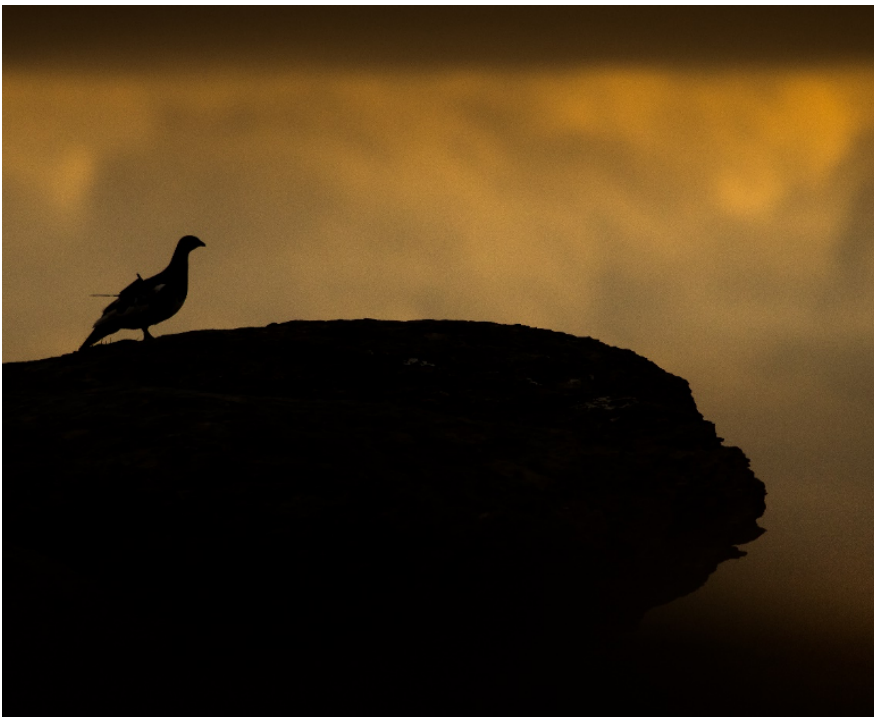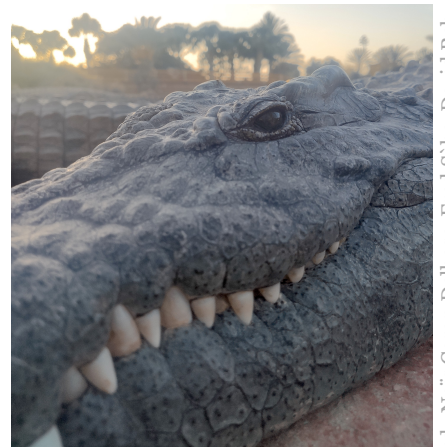
Virgile Daunay

ENES — PhD Student (K. Pisanski, D. Reby)

What does your laugh mean? Production and perception of context-specific volitional human laughter

Laughter has been extensively studied, particularly differences in volitional versus spontaneous laughs. However, within these two broad laughter types, laughs can be produced in a wide variety of social contexts. To test if the acoustic forms of laughter reflect their context of production, I acoustically analysed volitional laughs produced in eight scenarios and conducted playback experiments to investigate whether listeners can identify these scenarios.

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