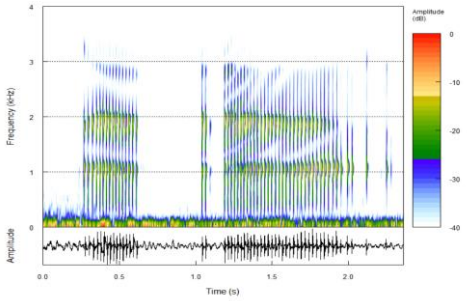
Post-doctoral Research Fellow in automatic discrimination of bird song for Bioacoustics population monitoring.

Funding: Post-doctoral funded by UiT The Arctic University of Norway

Location: Lab. ENES (https://www.eneslab.com/), Univ. Saint-Etienne, France and the Department of Arctic and Marine Biology of The Arctic University of Norway (Tromsø).

Keywords: Acoustic identification, automated processing of bird's vocalization, bioacoustics monitoring, ethology, ecology.



Description

Reliable estimation of the size or density of wild animal populations is important for effective wildlife management, conservation and ecology. Acoustic monitoring is becoming an effective mean to assess wildlife diversity, resulting in minimal impact to the environment (Sueur and Farina, 2015). The use of acoustic monitoring is usually motivated by the difficulty in observing the species because of its secretive behavior or the difficulty in accessing its habitat (Marques et al., 2013). This is particularly the case in mountain or arctic regions. At the ENES lab we recently demonstrated how bioacoustics could be used to monitor alpine ptarmigan populations (Marin-Cudraz et al 2019). We have developed methods to analyze long-term recordings obtained under field conditions. We can then estimate the number of males and the temporal dynamics of presence of each male as well as their reproductive status.

We now propose to develop a large-scale monitoring of populations of mountain and arctic birds, including rock and willow ptarmigan populations. The aim is to design solutions for large-scale monitoring in order to improve wildlife management and conservation in response to climate change (Henden et al. 2020).

About the position

A fixed-term 100 % position is available at the University of Saint-Etienne (France) in collaboration with UiT The Arctic University of Norway, for a period of 2 years.

The position is located at the ENES Lab. Part of the time will be also spent at The Arctic University of Norway, depending on the Covid-19 regulations. The starting date is early November 2020 (the date is negotiable).

The ENES lab is specialized in acoustic communication, with studies of coding and decoding of acoustic signals. The ENES lab is member of the CelyA labex, a collaborative group in acoustics. The Department of Arctic and Marine Biology is specialized in questions related to attribution and mitigation of climate change impacts on Northern ecosystems. It manages the COAT project (Climate ecological Observatory for Arctic Tundra – www.coat.no). The collaboration with the Department of Arctic and Marine Biology of the Arctic aims at developing passive bioacoustics monitoring for biodiversity assessments in response to climate change.

Responsibilities

The position is part of ENES and UiT long-term focus on adaptive ecosystem management and monitoring (Ims & Yoccoz 2017). Recent advances in bioacoustics technologies and artificial intelligence have opened up new research possibilities for monitoring wild animal populations. The applicant will work on large scale monitoring of populations of mountain and arctic birds, emphasizing the role of climate variability and change.

The applicant will be jointly advised by Dr. Sèbe Frédéric (ENES Lab, Univ. Saint-Etienne), and Pr. Yoccoz Nigel G. (Dpt of Arctic and Marine Biology /UiT), and will receive additional support from local and international partners.

The applicant is expected to develop analytical tools for identification, extraction, and automated processing of bird vocalization data. These tools will be used for research on behavioral and evolutionary ecology and to develop passive

bioacoustics monitoring for applications such as biodiversity assessments. The ENES lab and the DAMB research group has previously recorded hundreds of hours of audio. Additional data may also be obtained through existing and new collaborations, including possibly from field experiments. Initiatives based on personal interests are welcome.
The Post-doctoral Fellow is also expected to engage with the research group and contribute to an active, positive, and inclusive research environment with opportunities for personal and professional development.

Supervisors and host laboratories:
Sèbe Frédéric : Equipe de Neuro-Ethologie Sensorielle, ENES/CRNL, CNRS UMR 5292, University of Saint-Étienne, 23 rue du Dr Michelon, 42023 Saint-Étienne Cedex 2, France
Yoccoz Nigel G. : UiT The Arctic University of Norway, Department of Arctic and Marine Biology. Tromsø, Norway

Required profile:
The successful applicant must have:
- Doctoral degree (PhD) in a relevant subject area, such as (but not limited to) applied mathematics, computer science, information and communication technology, acoustic engineering, or machine learning. The applicant must have had her/his these approved or be able to document a confirmed date for the PhD defense by the time of the application deadline.
- A strong background in signal processing and a working knowledge of AI and machine learning algorithms, including their implementation for audio analysis, such as speech recognition or natural language processing.
- Strong computer programming skills, (R, Python, MATLAB and object-oriented programming.)
- Experience working with an interdisciplinary team.
- Interest in acoustics and/or bioacoustics, ecology, animal behavior, or related fields.
- A good track record of scientific publishing (e.g., scientific articles, technical reports, conference proceedings, conference presentations, or preprints).
- English language proficiency, both written and oral.
- Good physical condition and be willing and able to do field work.
- The ability to work independently, with a proactive approach with creativity.

Practical information:
Duration: 2 years, from November 2020 to November 2022.
Hosting laboratories:
-Laboratoire ENES-CRNL UMR 5292, University of Saint-Etienne, 23 rue du Dr Michelon, 42023 Saint-Etienne Cedex 2, France ;
-Department of Arctic and Marine Biology. UiT The Arctic University of Norway, Tromsø, Norway (www.uit.no)
Remuneration: ~ 3700 € per month gross salary (45000/year)
Application: send your CV and a cover letter before 10th of October, 2020 by email to
Sèbe Frédéric, frederic.sebe@univ-st-etienne.fr
Yoccoz Nigel Gilles, nigel.yoccoz@uit.no

Henden, J.-A., Ims, R. A., Yoccoz, N. G., Asbjørnsen, E. J., Stien, A., Mellard, J. P., . . . Uhd Jepsen, J. (2020). End-user involvement to improve predictions and management of populations with complex dynamics and multiple drivers. *Ecological Applications,*, e02120. doi:10.1002/eap.2120

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Sueur, J., and Farina, A. (2015). Ecoacoustics: the ecological investigation and interpretation of environmental sound. Biosemiotics, 8(3), 493-502. doi:10.1007/s12304-015-9248-x