

SIMEON QUIRINUS SMEELE

CONTACT INFO

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ABOUT ME

I'm a tenure track researcher at Ecoscience, Aarhus University. I work with deep neural networks to detect and classify bat species from audio and image data and use the results to model space use and migration. I'm looking to build a small research group to expand bat monitoring in Denmark and surrounding countries.

EDUCATION

- Dr. rer. nat.** 2019-2023
University of Konstanz | Konstanz, Germany
- Behavioural Ecology, *magna cum laude*
 - Within and between species approaches to the study of communication and cognition in parrots
 - Supervisors: Dr. Mary Brooke McElreath and Dr. Lucy Aplin
- Master of Biology** 2016-2018
University of Southern Denmark | Odense, Denmark
- Courses in behavior, bio-acoustics, terrestrial ecology, statistics, research projects, Matlab, sound and hearing, marine mammals, biodiversity.
 - Thesis topic: "Pinniped cognition: the ability to recall own behaviour on cue"
- Bachelor of Biology (minor in Mathematics)** 2013-2016
University of Southern Denmark | Odense, Denmark
- Courses in zoology, botany, ecology, ecotoxicology, statistics and mathematics.
 - Thesis topic: "Spatial memory in Daubenton's bats"

EXPERIENCE

Tenure track researcher **2025 - current**
Wildlife Ecology, Ecoscience, Aarhus University | Aarhus, Denmark

- Passive acoustic monitoring of bats
- Camera trapping of bats
- Population modelling of bats

Post doctoral researcher **2023 - 2024**
Wildlife Ecology, Ecoscience, Aarhus University | Aarhus, Denmark

- Passive acoustic monitoring of bats
- Camera trapping of bats

IMPRS doctoral researcher **2019 - 2023**
Max Planck Institute of Animal Behavior and Max Planck Institute for Evolutionary Anthropology | Radolfzell, Germany

- Within and between species approaches to the study of communication and cognition in parrots
- Supervisors: Dr. Mary Brooke McElreath and Dr. Lucy Aplin

Staff member **2022**
Museum Haus Otto Dix | Hemmenhofen, Germany

- Helping visitors (in German) in the museum during weekends in the summer season

Research assistant **2019**
University of Southern Denmark | Odense, Denmark

- Analysing large datasets on species demography and conservation
- Supervisor: Professor Dalia Amor Conde

Study group supervisor **2015-2017**
University of Southern Denmark | Odense, Denmark

- Helping first year Natural Science students work in groups on biology and mathematics projects

Teaching assistant **2014-2015**
University of Southern Denmark | Odense, Denmark

- Teaching first year Natural Science students in the general biology course

VOLUNTEERING

Volunteer **2023 - current**
Save the Children | Aarhus, Denmark

- Co-management volunteer group
- Registering participation
- Cooking food with Ukrainian children and their parents

- Research assistant (internship)**
2018 - 2019

University of Southern Denmark and Fuglezoo | Odense, Denmark

 - Co-supervising master student working on cooperative and vocal behaviour in parakeets
 - Supervisor: Professor Ole Næsby
- Animal trainer**
2017 - 2018

Marine Biological Research Centre | Kerteminde, Denmark

 - Training grey seals, great cormorants and common murre
 - Assisting with data collection for psychophysics, conservation and cognition
 - Supervisor: Dr. Kirstin Anderson Hansen
- Trainer and member general board**
2014 - 2018

Odense SportsKlatreKlub (climbing gym) | Odense, Denmark

 - Training the youth elite team, adult advanced team and schools
 - Moving the club to new facilities and setting up the new management structure
- Field assistant**
2014

University of Southern Denmark | Odense, Denmark

 - Collecting data from tit nest boxes
 - Conducting observational study of great tit foraging behaviour
 - Supervisor: Prof. Owen Jones

TEACHING

- Biology field course**
2021

Max Planck Institute of Animal Behavior | Radolfzell, Germany

 - I gave a lecture on bio-acoustics and co-supervised a group of master students working on local dialects and aggression in great tits
- General introduction biology**
2014-2015

University of Southern Denmark | Odense, Denmark

 - I worked as a teaching assistant during the biology part of a larger course that introduced natural science students to different subjects in the wider field
 - I had the responsibility for groups of 20-30 students that worked on exercises and presented the solutions

ACHIEVEMENTS

- Awards**

 - 2025 Research Reserve Grant, AU (€ 40,000)
 - 2022 Small Cluster Grant, CASCBS (€ 10,000)
 - 2021 Small Cluster Grant, CASCBS (€ 10,000)

ACTIVITIES

Peer reviews

- 2025 Methods in Ecology and Evolution
- 2024 Ethology, Ethology, Proceedings of the Royal Society B, Journal of Ornithology, Bioacoustics, Royal Society Open Science, Royal Society Open Science
- 2023 Methods in Ecology and Evolution
- 2022 PLOS Computational Biology, Scientific Reports, Ethology, Ethology, Scientific Reports
- 2021 Ecology and Evolution

Organisation

- 2021-current Preprint Team Member, Proceedings of the Royal Society
- 2021-2023 member Sustainability Group MPI-AB
- 2021 co-host Virtual ESLR Workshop (GatherTown)
- 2021 co-host Virtual IMPRS Grand Challenges Symposium (Zoom)
- 2020-2022 external PhD representative Max Planck Institute of Animal Behavior

PUBLICATIONS

2025

- Keck, Sarah M., Alex Barnhill, **Simeon Quirinus Smeele**, Maxine Hsu, Ailin Dolson-Fazio, Christian Bergler, Gregory F. Ball, Cara A. Krieg, and Karan J. Odom. (2025). **Deep machine learning allows classification of male and female songbird songs in a species with highly variable repertoires.** Behaviour, 1(aop), 1-35. <https://doi.org/10.1163/1568539X-bja10324>
- **Smeele, S. Q.**, , Senar, J. C., McElreath, M. B., & Aplin, L. M. (2025). **The effect of social structure on vocal flexibility in monk parakeets.** R. Soc. open sci. <https://doi.org/10.1098/rsos.241717>

2024

- *preprint* Ortiz, S.T., **Smeele, S.Q.**, Osvath, M., Guerrero, A.M., Sanchez, A.H., Ramirez, C.U., Almunia, J. and von Bayern, A.M.P. (2024). **Awareness of the future: Dolphins know when they need to remember for the future.** bioRxiv, 2024-11. <https://doi.org/10.1101/2024.11.28.625857>
- *preprint* Krasheninnikova, A., **Smeele, S. Q.**, Snijders, M., Haldar, E., Carpenter, J., Zamora, R., Naguib, M., Wolf, J. B., Gahr, M. and von Bayern, A. M. (2024). **Evolution of vocal production learning in parrots.** bioRxiv, 2024-11. <https://doi.org/10.1101/2024.11.05.622162>
- **Smeele, S. Q.***, Tyndel, S. A.*, Klump, B. C., Alarcon-Nieto, G. & Aplin, L. M. (2024). **callsync: An R package for alignment and analysis of multi-microphone animal recordings.** Ecology and Evolution, 14, e11384. <https://doi.org/10.1002/ece3.11384> [* co-first author]
- **Smeele, S. Q.***, Tyndel, S. A.*, Aplin, L. A. & McElreath, M. B. (2024). **Multilevel Bayesian analysis of monk parakeet contact calls shows dialects between European cities.** Behavioral Ecology, Volume 35, Issue 1, January/February 2024, arad093, <https://doi.org/10.1093/beheco/arad093> [* co-first author]

2023

- Smeele, S. Q., Senar, J. C., Aplin, L. A. & McElreath, M. B. (2023). **Evidence for vocal signatures and voice-prints in a wild parrot.** R. Soc. open sci. <https://doi.org/10.1098/rsos.230835>
- Mooney, A., Teare, J. A., Staerk, J., Smeele, S. Q., Rose, P., Edell, R. H., King, C. E., Conrad, L., & Buckley, Y. M. (2023). **Flock size and structure influence reproductive success in four species of flamingo in 540 captive populations worldwide.** Zoo Biology, 1-14. <https://doi.org/10.1002/zoo.21753>

2022

- Smeele, S. Q., Conde, D. A., Baudisch, A., Bruslund, S., Iwaniuk, A., Staerk, J., Wright, T. F., Young, A. M., McElreath, M. B. & Aplin, L. M. (2022). **Coevolution of relative brain size and life expectancy in parrots.** Proceedings of the Royal Society B, 289(1971), 20212397. <https://doi.org/10.1098/rspb.2021.2397>
- Smeele, S. Q. (2022). **Using relative brain size as predictor variable: Serious pitfalls and solutions.** Ecology and Evolution, 12, e9273. <https://doi.org/10.1002/ece3.9273>
- Bergler, C., Smeele, S.Q., S.A., Barnhill, A., Ortiz, S.T., Kalan, A.K., Cheng, R.X., Brinklöv, S., Osiecka, A.N., Tougaard, J. and Jakobsen, F. (2022) **ANIMAL-SPOT enables animal-independent signal detection and classification using deep learning.** Sci Rep 12, 21966. <https://doi.org/10.1038/s41598-022-26429-y>
- Torres Ortiz, S., Smeele, S.Q., Champenois, J. & von Bayeren A. M. P. (2022). **Memory for own actions in parrots.** Sci Rep 12, 20561. <https://doi.org/10.1038/s41598-022-25199-x>

2021

- Cantor, M.*, Chimento, M.*, Smeele, S. Q.*, He, P., Pappageorgiou, D., Aplin, L. M., & Farine, D. R. (2021). **Social network architecture and the tempo of cumulative cultural evolution.** Proceedings of the Royal Society B, 288(1946), 20203107. <https://doi.org/10.1098/rspb.2020.3107> [* co-first author]

2020

- Nielsen, R. O., da Silva, R., Juergens, J., Staerk, J., Sørensen, L. L., Jackson, J., Smeele, S. Q., & Conde, D. A. (2020). **Standardized data to support conservation prioritization for sharks and batoids (Elasmobranchii).** Data in brief, 33, 106337. <https://doi.org/10.1016/j.dib.2020.106337>
- Bergler, C., Schmitt, M., Maier, A., Smeele, S., Barth, V., & Nöth, E. (2020). **ORCA-CLEAN: A Deep Denoising Toolkit for Killer Whale Communication.** In INTERSPEECH (pp. 1136-1140). <http://dx.doi.org/10.21437/Interspeech.2020-1316>

2019

- Smeele, S. Q., Anderson Hansen, K., Ortiz, S. T., Johansson, F., Kristensen, J. H., Larsson, J., Siebert, U. & Wahlberg, M. (2019). **Memory for own behaviour in pinnipeds.** Animal cognition, 22(6), 947-958. <https://doi.org/10.1007/s10071-019-01286-x>

REPORTS

2025

- Nielsen, L. T., Brinkløv, S. M. M., Elmeros, M., Galatius, A., Grønkjær, P., Hansen, J. W., Hansen, J. L. S., Koziol, A. L., Larsen, M. M., Lønborg, C., Mohn, C., Petersen, I. K., **Smeele, S. Q.**, Strand, J., Stæhr, P. A., Sveegaard, S., Teilmann, J. & Tougaard, J. 2024. **Review af datablade for effektovervågning i danske havvindmølleparker**, Aarhus University, DCE - Danish Centre for Environment and Energy. 39 p. https://dce.au.dk/fileadmin/dce.au.dk/Udgivelser/Notater_2025/N2025_29.pdf

2024

- Brinkløv, S.M.M., **Smeele, S.Q.**, Uebel, A.S., Fjederholt, E.T. & Elmeros, M. (2024). **Bats surveys - pre-investigations for offshore wind farms in the area North Sea I**. Energinet Eltransmission A/S. https://dce.au.dk/fileadmin/dce.au.dk/Udgivelser/Eksterne_udgivelser/2024/Bat_surveys.pdf
- Brinkløv, S.M.M., **Smeele, S.Q.**, Fjederholt, E.T., Skalshøj, M.R., Elmeros, M. (2024). **Bestandsovervågning af flagermusarter i Mønsted Kalkgruber med fotofælder og citizen science**. Aarhus Universitet, DCE - Nationalt Center for Miljø og Energi, 27 s. - Videnskabelig rapport nr. 604. https://dce.au.dk/fileadmin/dce.au.dk/Udgivelser/Videnskabelige_rapporter_600-699/SR604.pdf

CONFERENCES

IBAC

2025

University of Southern Denmark, Kerteminde

- Talk: 'Quantification of bat offshore activity above the North Sea'

Oikos

2025

Innovate - Aalborg University

- Talk: 'Using Neural Networks for Continuous Monitoring of Bat Populations in Mønsted Kalkgruber'

IBAC AI in Bioacoustics

2024

Copenhagen University, Denmark (online)

- Talk: 'Passive acoustic monitoring of bats above the Danish North Sea using deep learning'

Active Sension Seminar

2024

Aarhus University, Denmark

- Talk: 'Animal Spot, a convolutional neural network to detect bat calls and classify genus/species'

Vocal Complexity and Social Learning Workshop

2023

Max Planck Institute for Evolutionary Biology, Germany

- Talk: 'Vocal flexibility in monk parakeets'

CES Hybrid Conference

2022

Aarhus University, Denmark (online)

- Talk: 'Monk parakeets exhibit individual vocal signatures and population-level dialects in their vocalisations'

- Talk: 'Brainy lives: do larger brained parrots live longer?'

SKILLS

- ● ● R, driving licence, GitHub, acoustic analysis, first aid, sea survival, elementary fire
 - ● ○ L^AT_EX, Python, Bayesian statistics, teaching and supervision, international collaborations, field work
 - ○ ○ Matlab, Bash, Git
- Languages**
- English (fluent)
 - Danish (fluent)
 - Dutch (fluent)
 - German (intermediate)

REFERENCES

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PERSONAL

Date of Birth 02-08-1992

Place of Birth Assen, The Netherlands

Nationality Dutch

Location Aarhus, Denmark