Neil Scheidwasser-Clow

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Education

University of Copenhagen — Copenhagen, Denmark
PhD Fellow, Public Health and Epidemiology — *2022 –*
Project title: Harnessing machine learning frameworks and deep learning-based representations for phylogenetic inference
Supervisor: Samir Bhatt, David Duchêne

EPFL — Lausanne, Switzerland
MSc in Life Sciences Engineering (Distinction), Minor: Computational neurosciences — *2019 – 2022*
Master's thesis: Analytical approaches to data from human virtual reality (VR) and neuro-physiology studies
Supervisor: Carmen Sandi

KTH Royal Institute of Technology — Stockholm, Sweden
Swiss European Mobility Programme – 3rd year Bachelor exchange — *2018 – 2019*

EPFL — Lausanne, Switzerland
BSc in Life Sciences Engineering — *2016 – 2019*

Experience

Logitech — Lausanne, Switzerland
Scientific advisor — *2021 – 2023*
Assisting interns for projects on deep-learning based speech representations

Engineering intern, CTO office — *Feb. 2021 – Aug. 2021*
Project: Paralinguistic analysis of speech and non-speech audio signals

EPFL — Lausanne, Switzerland
Research engineer — *Feb. 2022 – Sep. 2022*
Behavioural Genetics lab – Linking kinematic and fiber photometry data from behavioural tests in rodents

Student research assistant — *2019 – 2021*
Neuroengineering lab – Deep learning algorithms for 2D pose estimation of tethered flies
Psychophysics lab – Modelling the Sequential Metacontrast Paradigm with RNNs

Projects (selected)

University of Copenhagen — Copenhagen, Denmark
Department of Public Health — *2023 –*
D3P: Danish Pandemic Preparedness Platform
Goal: characterise a complete picture of the COVID-19 pandemic in Denmark using genomic sequencing, registers, and contact-tracing data
Pixels2Pathogens: leveraging deep learning-based pose estimation frameworks for early detection of *Escherichia coli* infection in broiler chickens
Phylo2Vec: a pip-installable package for fast vector representation of phylogenetic trees

EPFL — Lausanne, Switzerland
Behavioral Genetics Lab — *Feb. 2022 – Sep. 2022*
Design of a GUI to facilitate post-processing of data from DeepLabCut (kinematics) and fiber photometry for behavioral tests in rodents.

Publications

2023

The limits of the constant-rate birth-death prior for phylogenetic tree topology inference,
Khurana, M. P., **Scheidwasser-Clow, N.**, Penn, M. J., Bhatt S., & Duchêne, D. A.
Systematic Biology

Leaping through tree space: continuous phylogenetic inference for rooted and unrooted trees,
Scheidwasser-Clow, N.*, Penn, M. J.*, Penn, J., Donnelly, C. A., Duchêne, D. A., & Bhatt, S.
Genome Biology and Evolution
*Equal contribution

Speaker Embeddings as Individuality Proxy for Voice Stress Detection,
Wu. Z, **Scheidwasser-Clow, N.**, El Hajal, K., & Cernak, M
Proceedings of the 24th Interspeech conference **Interspeech**

Efficient Speech Quality Assessment using Self-supervised Framewise Embeddings,
Hajal, K. E., Wu, Z., **Scheidwasser-Clow, N.**, Elbanna, G., & Cernak, M.
International Conference on Acoustics, Speech and Signal Processing **ICASSP**

2022

BYOL-S: Learning Self-supervised Speech Representations by Bootstrapping,
Elbanna, G., **Scheidwasser-Clow, N.**, Kegler, M., Beckmann, P., & Cernak, M.
HEAR: Holistic Evaluation of Audio Representations (NeurIPS 2021 Competition) **PMLR**

Hybrid Handcrafted and Learnable Audio Representation for Analysis of Speech Under Cognitive and Physical Load,
Elbanna, G., Biryukov, A., **Scheidwasser-Clow, N.**, Orlandic, L., Mainar, P., Kegler, M., Beckmann, P. & Cernak, M.
Proceedings of the 23rd Interspeech conference **Interspeech**

SERAB: A multi-lingual benchmark for speech emotion recognition,
Scheidwasser-Clow, N., Kegler, M., Beckmann, P., & Cernak, M.
International Conference on Acoustics, Speech and Signal Processing **ICASSP**

- Featured as one of the strongest submissions of the HEAR 2021 NeurIPS challenge.

2021

Commentary: The Risky Closed Economy: A Holistic, Longitudinal Approach to Studying Fear and Anxiety in Rodents,
Scheidwasser-Clow, N., Faggella, M., Kozlova, E., & Sandi, C.
Frontiers in Behavioral Neuroscience

Preprints & upcoming publications

Life course analysis using deep learning approaches: a simulation study,
Coupland H., **Scheidwasser-Clow N.**, Katsiferis A., Flaxman S., Hulvej Rod N., Mishra S., Bhatt S., Unwin H.J.T.
Under review, 2023

Phylo2Vec: a vector representation for binary trees,
Scheidwasser-Clow, N.*, Penn, M. J.*, Khurana, M. P., Duchêne, D. A., Donnelly, C. A., & Bhatt, S.
Under review, 2023
*Equal contribution

- Code: https://github.com/Neclow/phylo2vec

Presentations

Phylo2Vec: A vector representation of binary trees,
Scheidwasser-Clow, N.*, Penn, M. J.*, Khurana, M., Donnelly, C. A., & Bhatt, S.
2023 ICLR First Workshop on Machine Learning & Global Health.
*Equal contribution

Leaping through tree space: continuous phylogenetic inference for rooted and unrooted trees,
Scheidwasser-Clow, N.*, Penn, M. J.*, Penn, J., Donnelly, C. A., Duchêne, D. A., & Bhatt, S.
2023 Mathematics of Evolution Workshop on Algorithms and Software in Phylogenetics.
*Equal contribution

Teaching

University of Copenhagen — Copenhagen, Denmark
Lecturer — *2023 –*

2023: Data visualisation and storytelling (PhD course; created the course)

2023: Ethics of AI (one lecture)

EPFL — Lausanne, Switzerland
Student assistant — *2019 – 2022*

2021-2022: Information, Computation, Communication (CS-119)

2021-2022: Applied data analysis (CS-401)

2019-2021: Analysis III (MATH-203)

2019-2021: Projects in Informatics (for SV) (CS-116)

Technical Skills

Operating systems: Windows, Linux
Office automation: Microsoft Office, LaTeX
Programming languages: Python, C++, Matlab, basic knowledge of Bash, R, Julia, Ruby
Machine learning frameworks: PyTorch, Jax, Tensorflow, Keras, scikit-learn
Audio processing: Audacity
Image processing: ImageJ
GUI design: Tkinter
Web development: Basic knowledge of Jekyll and Hugo

Languages

French, English: Native speaker
German, Danish, Swedish, Mandarin Chinese: Elementary knowledge

Other interests

Scrabble: Under-18 French World Scrabble Champion (2015), in world top-100 for 5 years
Sports: Football, running, bouldering, skiing, tennis, squash, padel, hiking...
Student organizations:

- Erasmus Student Network (ESN):
  - Copenhagen: commitee member (2022-2023), Event Manager (2023), Treasurer (2023-)
  - Lausanne: commitee member (2020-2022)
- Data Analytics Group (DAG) at EPFL: co-founder
  - Goal: build a strong community of students who share a passion for data science and artificial intelligence
  - 2022: Head of Communications
  - 2021: Head of Event Management
  - 2021-2022: designed 20+ coding challenges in Python (data science and basic algorithms)

Other: Chess, cooking, guitar