

Monday

8h45-9h Welcome, introduction

9h-10h Keynote

Harnessing AI in phylogenomics

Tal Pupko

10h-11h Phylogenetics (1/2)

Phyloformer: Towards fast and accurate phylogeny reconstruction with self-attention networks

Luca Nesterenko, Luc Blassel, Bastien Boussau, Laurent Jacob

Learning from an Artificial Neural Network in Phylogenetics

Alina Leuchtenberger

11h-11h30 coffee break

11h30-13h Simulating realistic data

Assessing usefulness of artificial genomes via local ancestry inference

Maiwen Demeulle, Titouan Chambe, Antoine Szatkownik, Léo Planche, Burak Yelmen, Flora Jay

Simulations of Sequence Evolution: How (Un)realistic They Are and Why

Johanna Trost, Julia Haag, Dimitri Höhler, Laurent Jacob, Alexandros Stamatakis, Bastien Boussau

Fitting Indel Evolution Model Parameters to PFam Protein Alignments with a GPU-accelerated Framework

Annabel Large, Ian Holmes

13h-14h30 lunch break

14h30-15h30 Keynote

Deep learning for the phylogenetic inference of species diversification

Hélène Morlon

15h30-16h30 Phylogenetics (2/2)

Neural networks can predict ghost species diversity from gene transfers

Enzo Marsot, Théo Tricou, Laurent Jacob, Bastien Boussau, Damien De Vienne

Predicting Phylogenetic Bootstrap Values via Machine Learning

Julius Wiegert, Julia Haag, Dimitri Hoehler, Alexandros Stamatakis

16h30-17h coffee break

17h-19h poster session [posters could hang for the rest of the conference?]

Tuesday

9h-10h Keynote

Generative adversarial networks, transfer learning, and interpretability for evolutionary inference

Sara Mathieson

10h-11h Predictions on a single sequence (1/2) : Protein Language Models

Illuminating the functional landscape of the dark proteome across the Animal Tree of Life through natural language processing models

Gemma I. Martínez-Redondo, Israel Barrios, Marçal Vázquez-Valls, Ana M. Rojas, Rosa Fernández

Deciphering Deep Phylogeny and Evolution of Protein Families through Protein Language Models

Ivan Koludarov

11h-11h30 break

11h30-13h30 Predictions on a single sequence (2/2)

Classification of the evolutionary origin of orphan genes using machine learning approaches

Nikolaos Vakirlis, Anne Kupczok, Jori De Leuw, Leonardos Mageiros, Christoforos Nikolaou

Unsupervised learning as a tool to retrieve genomes from undersampled taxa: Fast and slow evolution in myxozoans

Claudia Weber

Long context windows improve deep learning methods for predicting genomic regulation

Ian Holmes

Interpreting artificial neural networks for detecting genome-wide association signals for complex traits

Burak Yelmen, Maris Alver, Silva Kasela, Lili Milani

13h30-14h30 lunch break

Afternoon: time for exchange/networking, optional short hike (bus + hike at Sroumpoulas
<https://blog.fodelebeach.gr/uncategorized/mount-stroumboulas/>)

Wednesday

9h-10h Keynote

Inference of Coalescence Times and Variant Ages Using Convolutional Neural Networks
Pier Palamara

10h-11h Population genetics (1/2)

Using supervised machine learning methods to infer demographic history from genomic data
Arnaud Quelin, Flora Jay, Frédéric Austerlitz

Unifying Ideas from the Sequentially Markovian Coalescence with Deep Learning for Population Genomic Inference
Kevin Korfmann, Aurélien Tellier

11h-11h30 break

11h30-13h Detecting positive selection

Scalable CNN-based classification of selective sweeps using derived allele frequencies
Sjoerd Van den Belt, Nikolaos Alachiotis

Detecting selective sweeps using FPGA-accelerated spiking convolutional neural networks
Hanqing Zhao, Federico Corradi, Zhanbo Shen, Nikolaos Alachiotis

Detecting Positive Selection using Convolutional Neural Networks
Charlotte West, Conor Walker, Nicola DeMaio, Nick Goldman

13h-14h30 lunch break

14h30-16h Phylodynamics

Improving tree representation and neural network architecture for deep learning from phylogenies in phylodynamics and diversification studies
Manolo Perez, Olivier Gascuel

Transformers for EpiDemiological DYnamics: from genomic data to epidemiological parameters
Vincent Garot, Luca Nesterenko, Luc Blassel, Anna Zhukova, Samuel Alizon, Laurent Jacob

Assessing the power of artificial intelligence approaches for birth-death model classification
Pablo Gutiérrez de la Peña, Guillermo Iglesias Hernández, Andrea Sánchez Meseguer, Isabel Sanmartín

16h-16h15 closing comments

16h15-18h poster session