

Simon Adamov

Abstract:

About 1.5 million people or 15-20% of the Swiss population suffer from pollen allergy. The economic damage due to medical costs and work absences is estimated at CHF 1-4 billion per year. Rising temperatures due to climate change are leading to an earlier pollen season and, in the case of certain pollen species, to higher pollen loads. The burden on the population is therefore likely to increase in the coming years. To provide the public with more accurate and up-to-date pollen measurements, MeteoSwiss has installed a network of automatic pollen monitoring stations. Technologies for automatic, real-time monitoring of pollen concentrations have advanced considerably in recent years and are increasingly available. This opens up the possibility to calibrate numerical pollen forecast models and to make a significant step forward in the quality of pollen forecasts. Unfortunately, the calculation of pollen forecasts in a traditional NWP model (e.g. COSMO) requires considerable computational resources. While MeteoSwiss measures >40 different pollen species, only 5 of them can be modelled due to computational limitations. Therefore, the search for a model architecture that requires less computational power while maintaining prediction quality to forecast additional pollen species has become important. This is where Aldernet comes in, a newly developed neural network for surface level pollen forecasting. Aldernet shows that it is indeed possible to infer surface level pollen concentrations from other prognostic variables, using only statistical learning. Currently, such efforts are limited to one species at a time (hence the model name :)). However, the results show great potential for extending the scope to other species and providing the public with a more complete pollen forecast.