KI und COVID

Erklärbarkeit und Entscheidungsunterstützung durch KI in Pandemie-Situationen

**Analyzing European countries
SARS-CoV-2 policies**

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Objectives

❖ To explore the effects of governments' non-pharmaceutical interventions (NPIs) effect on the spread of the virus in in thirty European countries

➢ based on data from European center of disease prevention and control COVID database
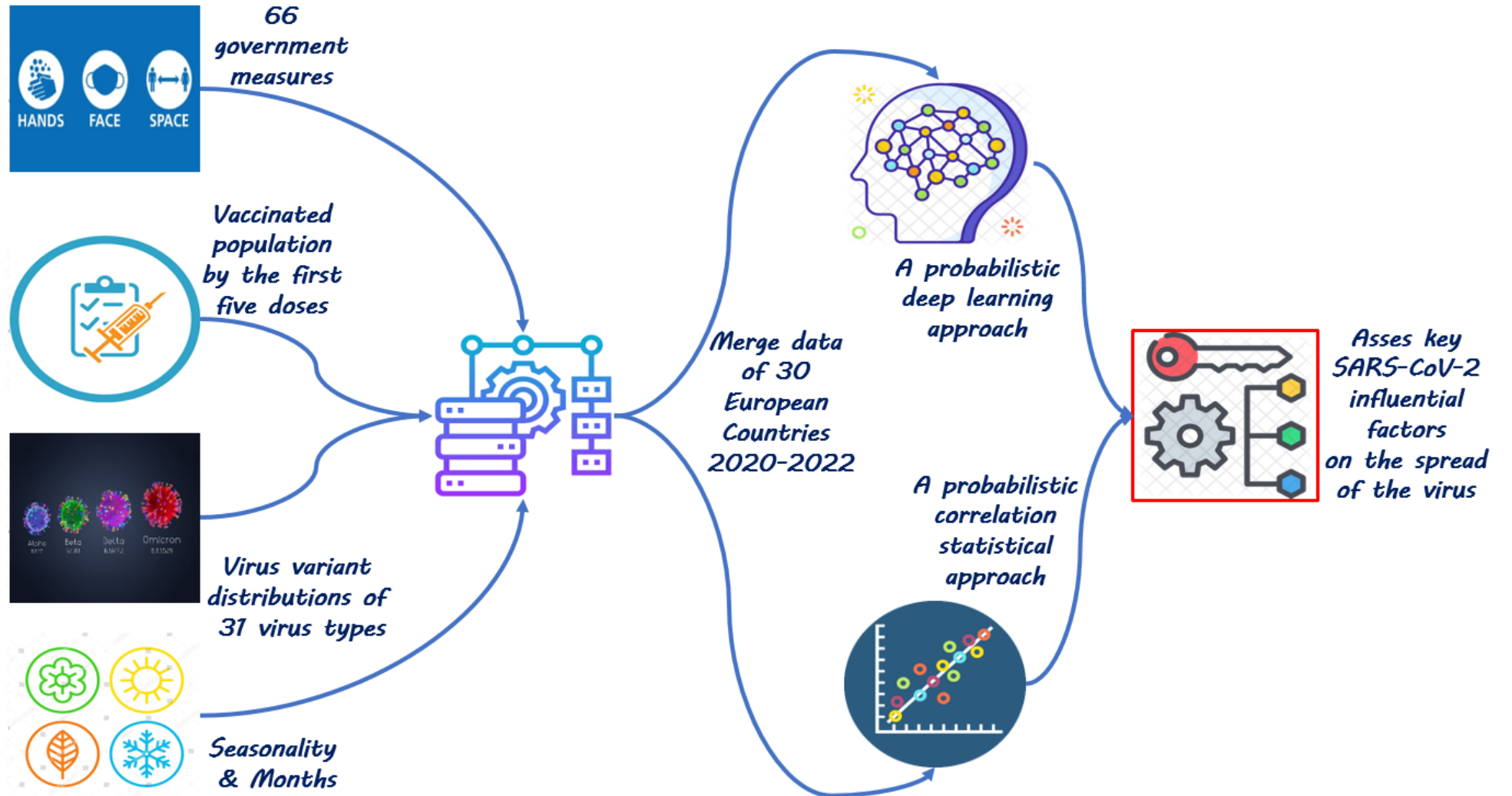
Methods

❖ Method 1: Bayesian Convolutional Neural Networks
  ➢ predict the reproduction of the virus one month ahead of the time from each arbitrary day!
    ❖ Relative heavy amount of the memory needed to train Tensorflow process!
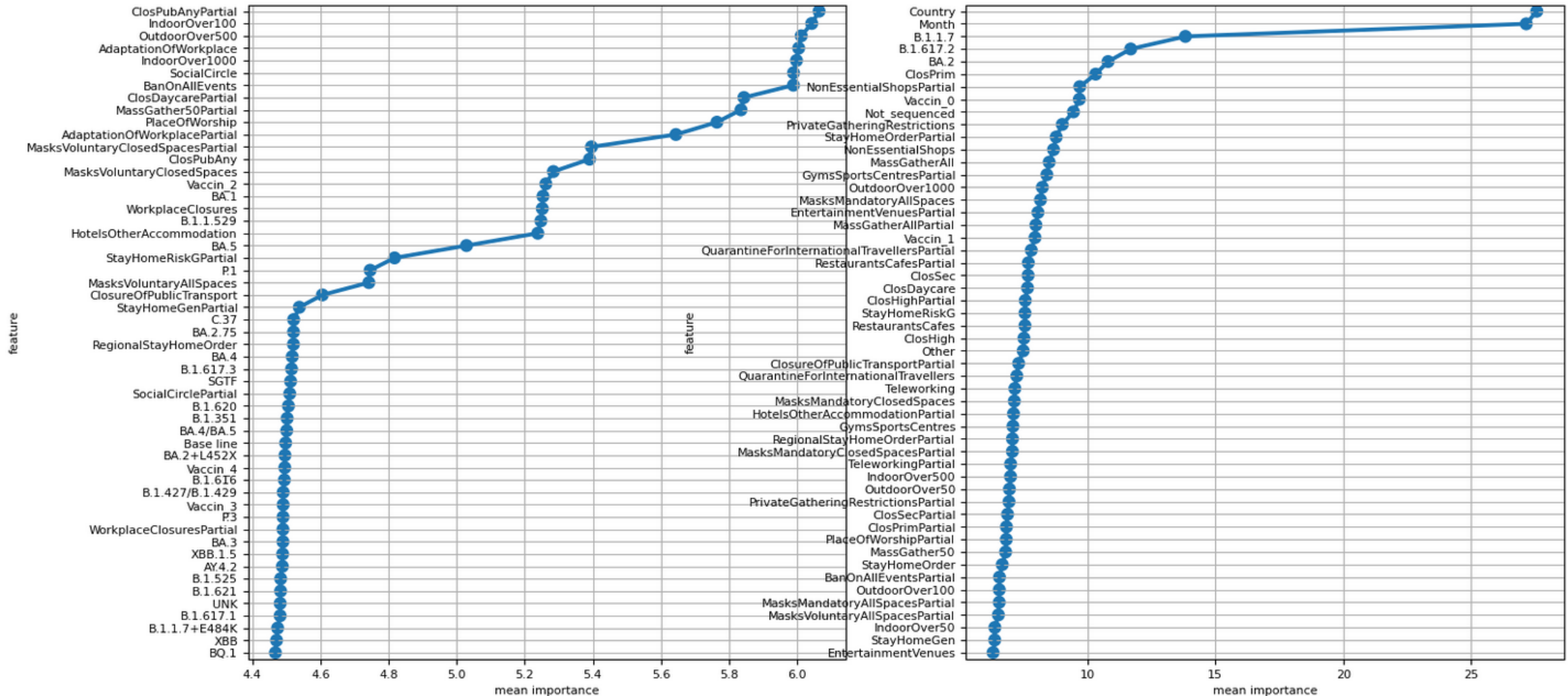   ❖ Linux Koblenz university server used!

❖ Method 2: Bayesian statistical Analysis
  ➢ compare the distribution of pandemic growth rates, in the days where the selected explanatory factor was active, with the distribution of the pandemic growth rates in the days where the selected explanatory factor was Not active!
    ❖ No-U-turn sampler (NUTS) implemented needs too much time!
      ❖ Linux Koblenz university server used!
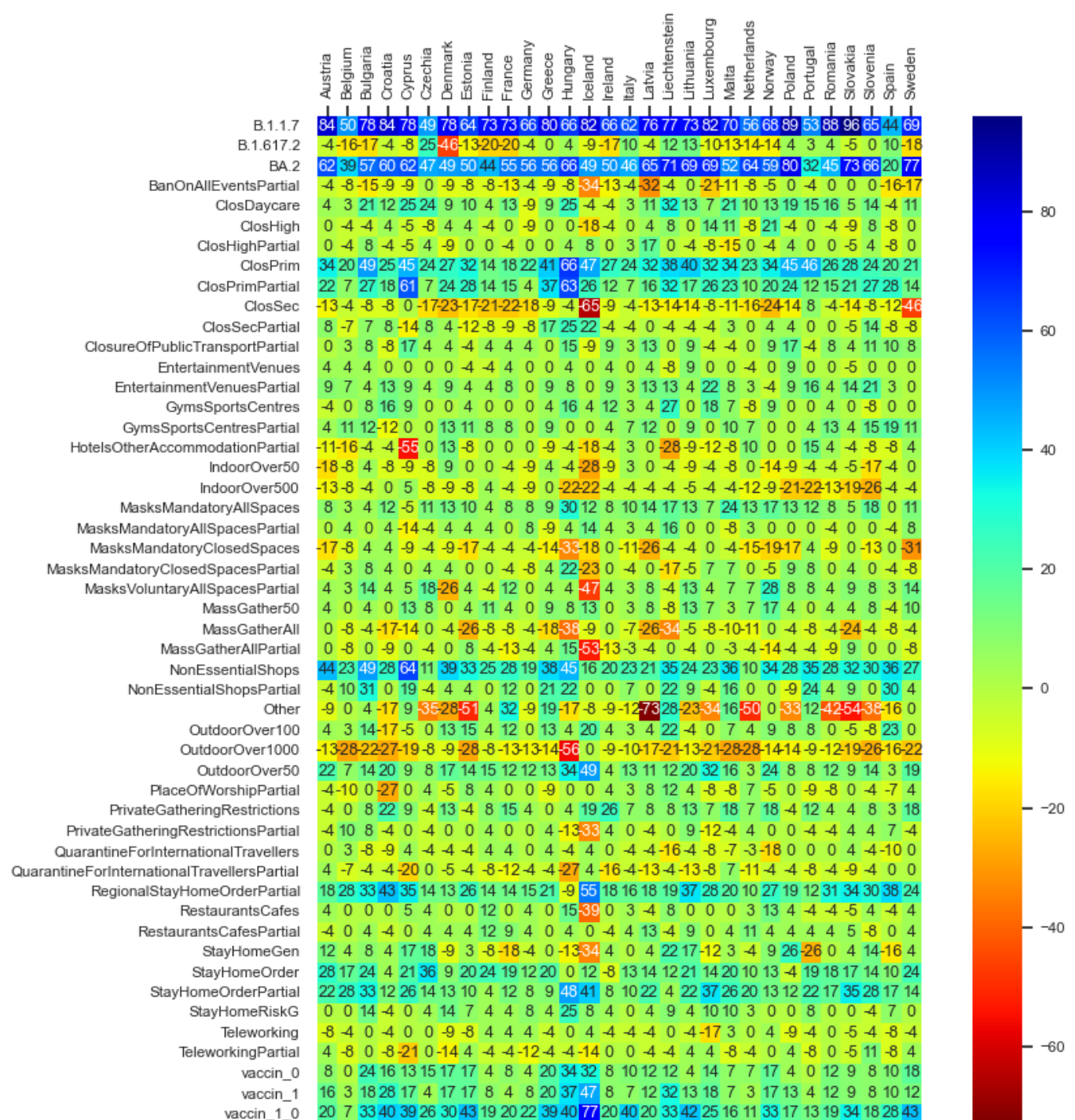
Overall approach

66 government measures

Vaccinated population by the first five doses

Virus variant distributions of 31 virus types

Seasonality & Months

Merge data of 30 European Countries 2020-2022

A probabilistic deep learning approach

A probabilistic correlation statistical approach

Asses key SARS-CoV-2 influential factors on the spread of the virus

Importance of each SARS-CoV-2 pandemic explanatory feature over 30 European countries

Average gains expressed in terms of difference of reproduction values between counterfactual scenarios

14.03.2024

Lessons

❖ Seasonality and virus variants played a dominant role in controlling the spread of the virus compared to a number of government policies (NPIs)

❖ Large probable growth rates of the virus visible in Autumn and smallest pandemic growth is predicted in Spring

❖ The first two vaccination doses and closing the primary schools, general and regional lockdowns, and non-essential shops closures substantially contributed to the reduction of the spreading of the virus

❖ Results of statistical inference approve the predictions of the deep learning model

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Thank you for your attention!
Your questions...

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