Presentazione

Upon scrutinizing the models presented by Osvaldo, we discovered strikingly similar structures among them, particularly in their fundamental attributes. Notably, each model exhibits a stratification mirroring the altitude levels of the region under study.

Clusters observed in higher elevations consistently display lower concentrations of pm10. Additionally, all models identified specific stations exhibiting an intriguing seasonal trend: lower pm10 levels in winter and higher levels in summer. Notably, these stations are situated in elevated regions, leading us to speculate that snow presence could play a role in mitigating pm10 levels. Moreover, these stations exhibit the lowest levels of particulate matter.

Further analysis revealed several covariates influencing pm10 levels, with some models incorporating them directly into their structures. Vegetation emerges as a significant factor, displaying two discernible patterns: increased vegetation correlating with reduced pm10 levels, and higher vegetation density associated with lower pm10 concentrations. The latter correlation could be attributed to the prevalence of high vegetation in elevated areas.

Seasonal fluctuations in vegetation density were also observed, prompting deeper investigation due to their potential impact on model distinctions among regions.

Precipitation emerged as another influential factor, particularly notable during periods of heavy rainfall such as October, coinciding with a notable decrease in pm10 levels. Conversely, wind exerted an

LIST

SIMILARITIES BETWEEN MODELS

each model exhibits a stratification mirroring the altitude levels of the region under study.

higher elevations→ low pm10

summer→low

winter→high

EXCEPT for outliers (interesting!)

VARIABLES

more vegetation→low

higher vegetation→low

(could be temperature or others since they follow a trend during the year)

precipitation→low

wind→ high (but masked by rain)

ANTRHOPOGENIC

NOx→ high

opposing effect, albeit often overshadowed by precipitation's impact.

Moving to anthropogenic variables, NOx emissions showcased a pronounced effect, evident in the clear differentiation of clusters by models incorporating covariates. Similarly, traffic density emerged as a significant determinant of pm10 levels.

To quantitatively assess the clustering results, we employed the Adjusted Rand Index (ARI), revealing a trend of higher agreement among models sharing similar architectural features, such as temporal, spatial, or covariate incorporation.

Interestingly, models exhibited greater consensus during non-summer months, likely due to the broader dispersion of pm10 levels facilitating clearer cluster distinctions. Conversely, the ambiguity increased during summer months, where differing architectural aspects led to varied model responses.

In summary, our analysis underscores the intricate interplay of natural and anthropogenic factors influencing pm10 levels, with model architecture playing a pivotal role in interpreting these dynamics.

bovine→high

traffic→high

AGREEBLNESS

why using this metric

same architecture→more agreeableness

winter→more agreeableness

SLIDES

1. plot with mode clusters
2. plot of the altitude with the cluster (the one colored in brown and green)
3. xy plot of altitude
4. plot of vegetation trend (hvi and lvi) + gif drpm LA_hvi
5. trend plot precipitation (not the one of the wind, it’s not clear, just say)
6. trend plot Nox and nh3_livestock
7. equation of ARI + plot of ARI for each model

8. plot of ARI between models + plot trend (the “orange” one) of pm10