AUGMENTED INTELLIGENCE FOR AVALANCHE FORECASTING

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Swiss Data Science Center and WSL institute for Snow and Avalanche Research (SLF Davos)
Augmented intelligence for avalanche forecasters

Data:
Weather stations:
Snow profiles:
Weather forecasts:
and more…

Analysis of large data sets!

Swiss avalanche bulletin

Assessing avalanche danger:
• Qualitative descriptions of key terms
• Human-decision process: expert knowledge
• Potential for forecast bias in space and time
Augmented intelligence for avalanche forecasters

IN:
- Weather stations + snow sim + forecasts

TARGET:
- Avalanche bulletin for day+1
- 22 seasons of paired data
Real-time predictions

Nowcast measured weather data

Forecast weather data NWP COSMO

Input data

SLF’s server

SNOWPACK simulations

Nowcast & Forecast predictions (flat, N, E, S, W)

Dry-snow conditions

Random Forests

every 3h

every 3h
Regional prediction: Davos district

Winter season 2020-2021, aggregated probability per district

Pearson correlation: 0.79
MSE: 0.20

Pearson correlation (nowcast): 0.76
MSE: 0.22
Forecast predictions on Tuesday, 01 Feb 2022
Per-avalanche problem assessment

Correct predictions [%]

- Persistent weak layer
- Wind drift
- New snow
- No problem

[Bar chart with green bars showing percentage for each problem]