

Towards a Cognitive Digital Twin of a Country with Emergency, Hydrological, and Meteorological Data

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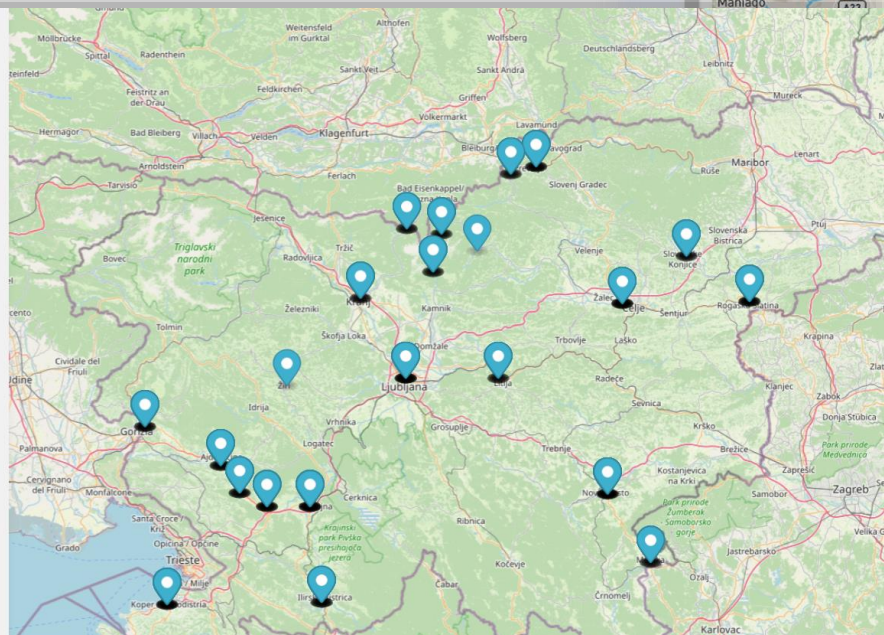
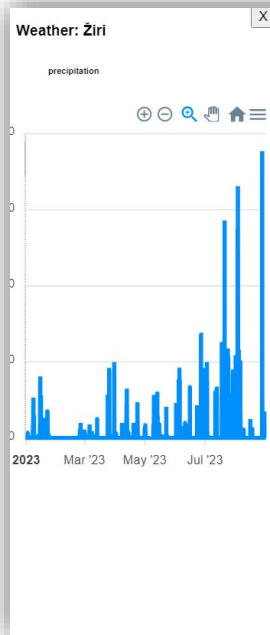
Cognitive Digital Twin of a Country

- Digital twin => replica of physical entity
- Domains of digital twins:
 - Manufacturing
 - Health
 - Smart cities
- DT of a country => Simulate, forecast social characteristics
- Digital twin of Singapore



Cognitive Digital Twin of Slovenia

- Sensors
- Media monitoring (SLO / other countries about SLO)



Medijsko spremljanje

Reading mode Paused

Novice v živo

Poročanje znotraj Slovenije

Prejeto poročilo o dogodkih v Sloveniji

Prejeto poročilo o dogodkih v državi Sloveniji

Map of Slovenia with media monitoring overlay. A blue pin is located near Trieste, with a tooltip that reads: "Prihodnje leto za uskladitev pokojnin predvidene več kot pol milijarde evrov" and "Publisher: 24ur.com".

Wed Oct 04 2023, 15:34

Prihodnje leto za uskladitev pokojnin predvidene več kot pol milijarde evrov

Minister za delo, družino, socialne zadeve in enake možnosti Mesec je namreč v začetku tedna napovedal polno uskladitev pokojnin januarja prihodnje leto, in sicer v višini 8.2 odstotka. Kot je pojasnil po današnji seji vlade, izračun temelji na trenutnih ocenah Urada za makroekonomske analize in razvoj (Umar) o rasti plač in inflacije. [Read more](#)

24ur.com

Prihodnje leto za uskladitev pokojnin predvidene več kot pol milijarde evrov

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Necenzurirano.si

Huda nesreča v bližini Save: En policist umrl, trije poškodovani

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preberi.si

SIOL.net: Žreb jo je zagodel Bravu in Radomljam. Kdo bo potegnil krajšo?

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preberi.si

Avto.info: Prihaja najodmevnejši dogodek v regiji - Operacija: NightStrike

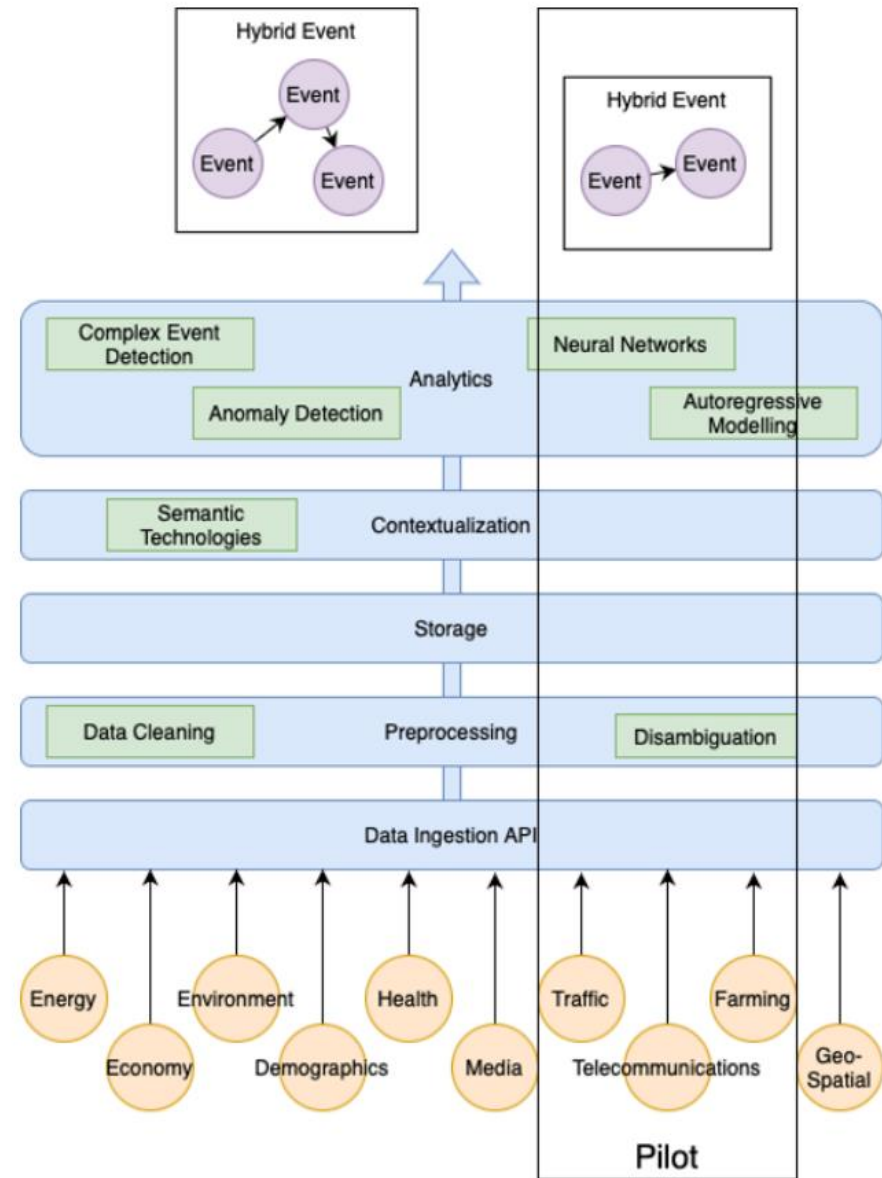
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MMC RTV Slovenija

Methodology

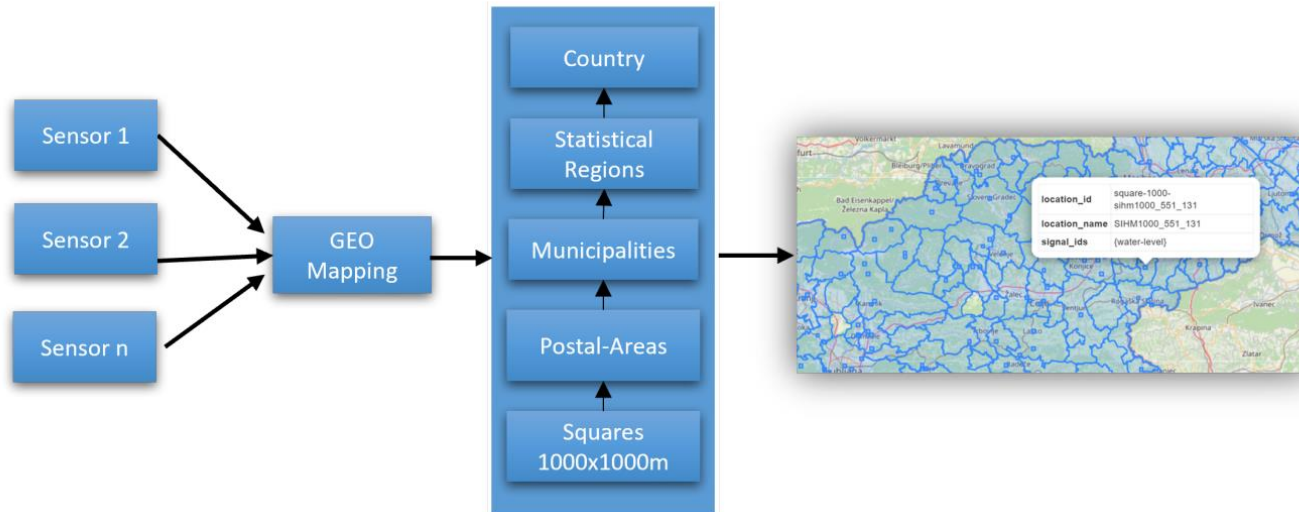
Conceptual Design

- Data
 - ARSO weather
 - ARSO surface waters
 - SOS interventions
- Data clients (scrape, ingest)
- ETL (extract, transform, load)



Data Aggregation

- By time
- By geospatial location



Experiments

Predicting Floods in Area of Poljane Valley

- Preliminary experiments
- Dataset: Feb. 2015 – Aug 2023
- Data split:
 - Training: Feb. 2015 – Dec. 2021
 - Validation: Jan. 2022 – Dec. 2022
 - Testing: Jan. 2023 – Aug 2023
- Initial columns:
 - Precipitation
 - Temperature
 - Humidity
 - Wind speed / direction
 - Number of emergency events
- Resampled 12H
- Feature engineering
 - Highest correlations around ~ 0.37
 - Interactions between columns
 - Non linear transformations



Results

	Logistic Regression	Random Forest	XGBoost
Precision	0.05	0.40	0.54
Recall	0.33	0.66	0.67
F1 score	0.08	0.50	0.60

Future Work

- Feature engineering
- Knowledge graph
- Modelling of multiple locations