Zastosowanie modelu Tile2Vec

do zbioru danych EuroSAT w wariancie multispektralnym

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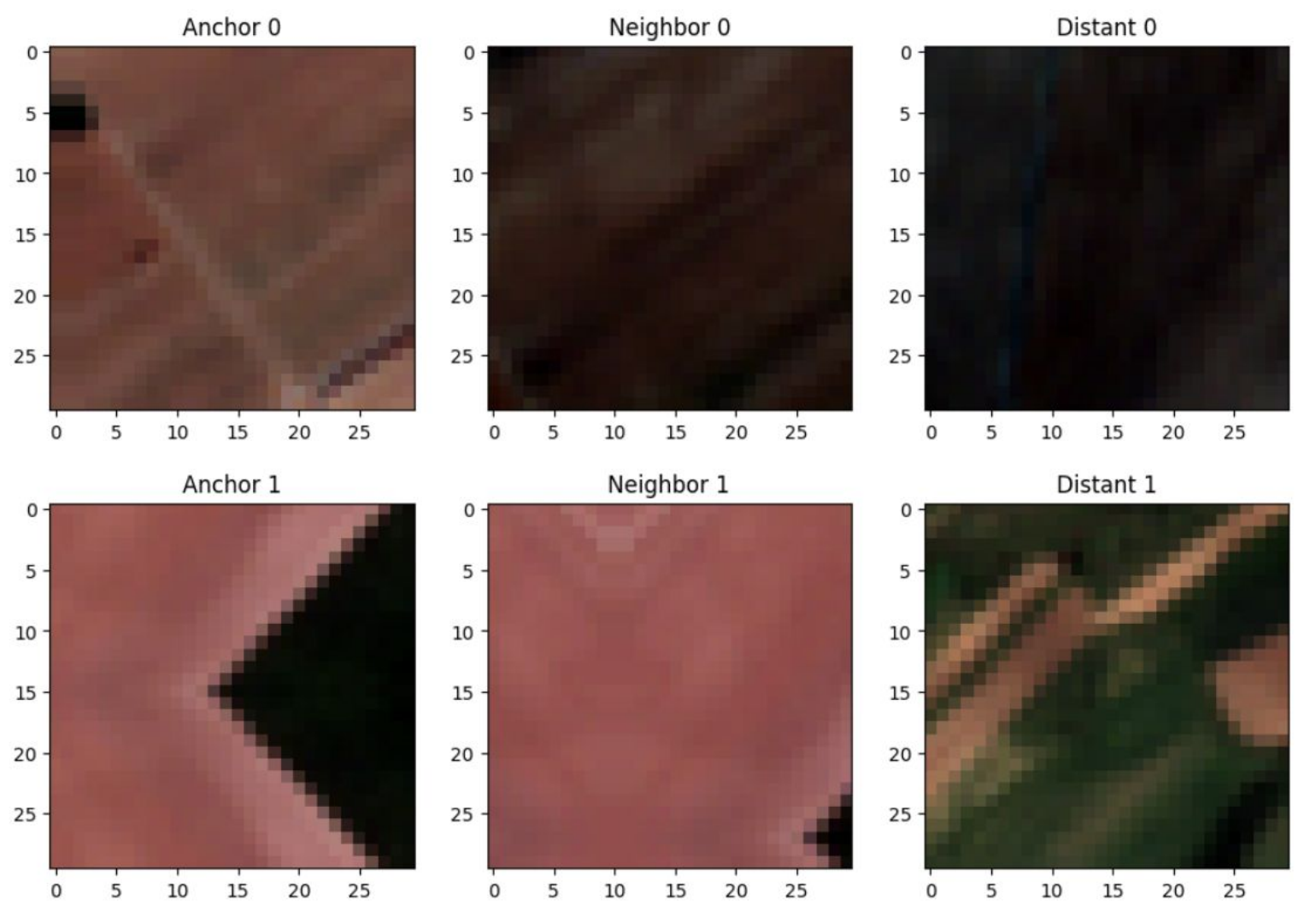
MODEL TILE2VEC

- Analogia do metod NLP, gdzie słowa o podobnym brzmieniu mają podobne znaczenie, tutaj obrazy geograficznie sąsiednie są do siebie podobne
- Unsupervised
- Trenujemy sieć na trójkach płytek: podstawowa (anchor), sąsiadująca (neighbor) i odległa (distant)
- Działa nie tylko dla danych obrazowych



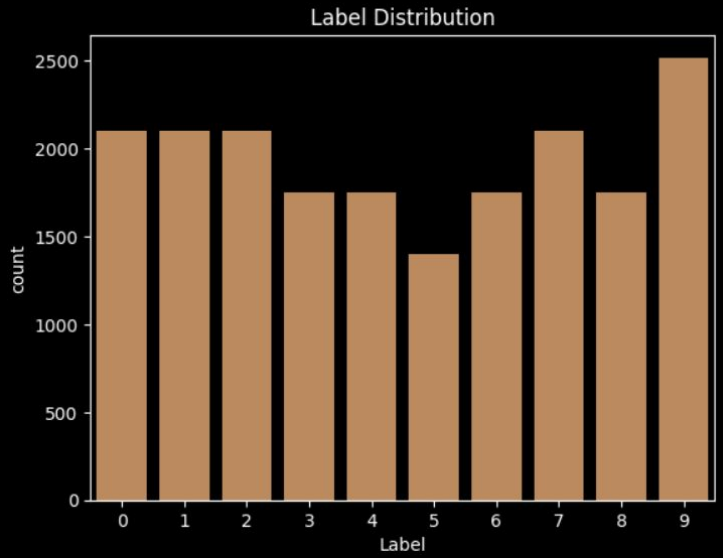
PRZYKŁADY

ZBIÓR DANYCH

EuroSAT multispectral

https://www.kaggle.com/datasets/apollo2506/eurosat-dataset

Dane satelitarne pochodzące z satelity Sentinel-2 w wariancie wielospektralnym. Dane zawierają etykiety opisujące jakiego rodzaju jest obiekt na zdjęciu.



Annual Crop	0
Forest	1
Herbaceous Vegetation	2
Highway	3
Industrial	4
Pasture	5
Permanent Crop	6
Residential	7
River	8
Sea Lake	9

SENTINEL-2

European Union

esa

About Copernicus Sentinel-2...

WHAT?

A constellation of **two identical satellites in the same orbit**, Copernicus Sentinel-2 images land and coastal areas at high spatial resolution in the optical domain

WHERE?

Designed and built by a group of around **60 companies** led by **Airbus Defence** and Space for the space segment and **Thales Alenia Space** for the ground segment

WHICH?

Main applications include agriculture; land ecosystems monitoring; forests management; inland and coastal water quality monitoring; disasters mapping and civil security

WHO?

Services include **CLMS** (Copernicus Land Monitoring Service); **CMEMS** (Copernicus Marine Environment Monitoring Service); **CEMS** (Copernicus Emergency Management Service) and Copernicus Security Service; among others

WHEN?

Sentinel-2A was launched on 23 June 2015; Sentinel-2B on 7 March 2017, both on a Vega rocket from Kourou, French Guiana

DATA AND USERS

As of July 2020, about **20 million products** have been generated and made available for download, culminating a total of 10 Petabytes

DATA ACCESS

https://scihub.copernicus.eu

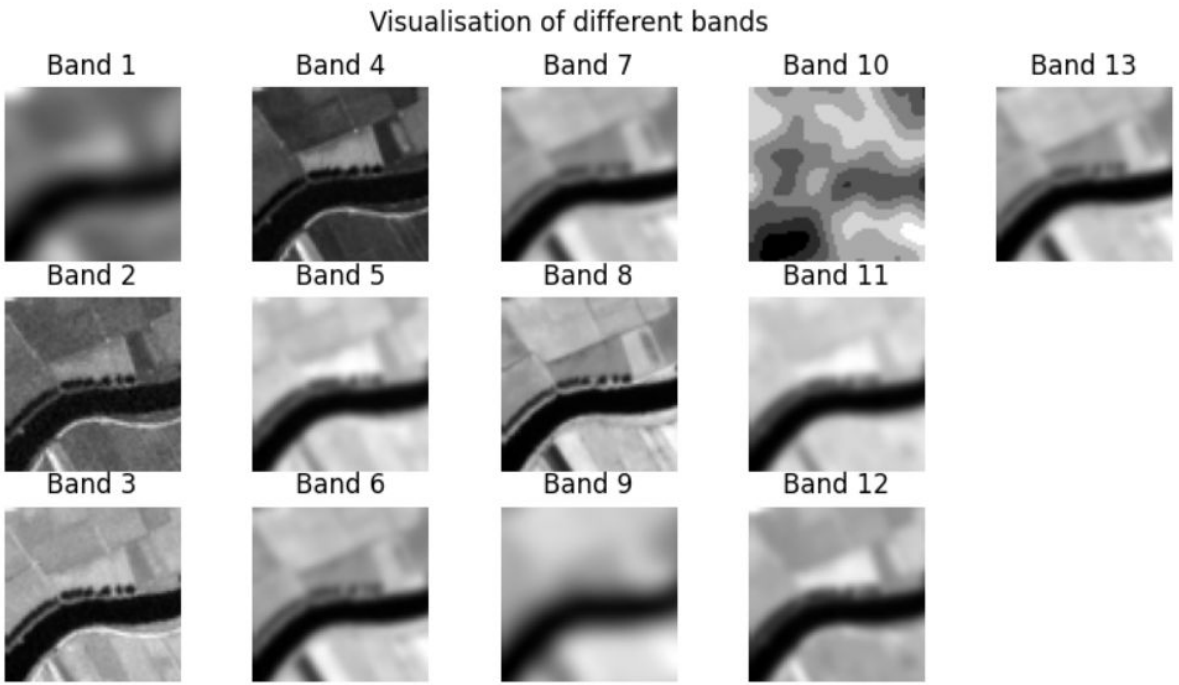
WHATS NEXT?

Continuity over the coming years will be ensured by the **launch of additional satellites** (Sentinel-2C and Sentinel-2D). Furthermore, a new generation of Sentinel-2 satellites is being prepared, to take up the relay from the first generation

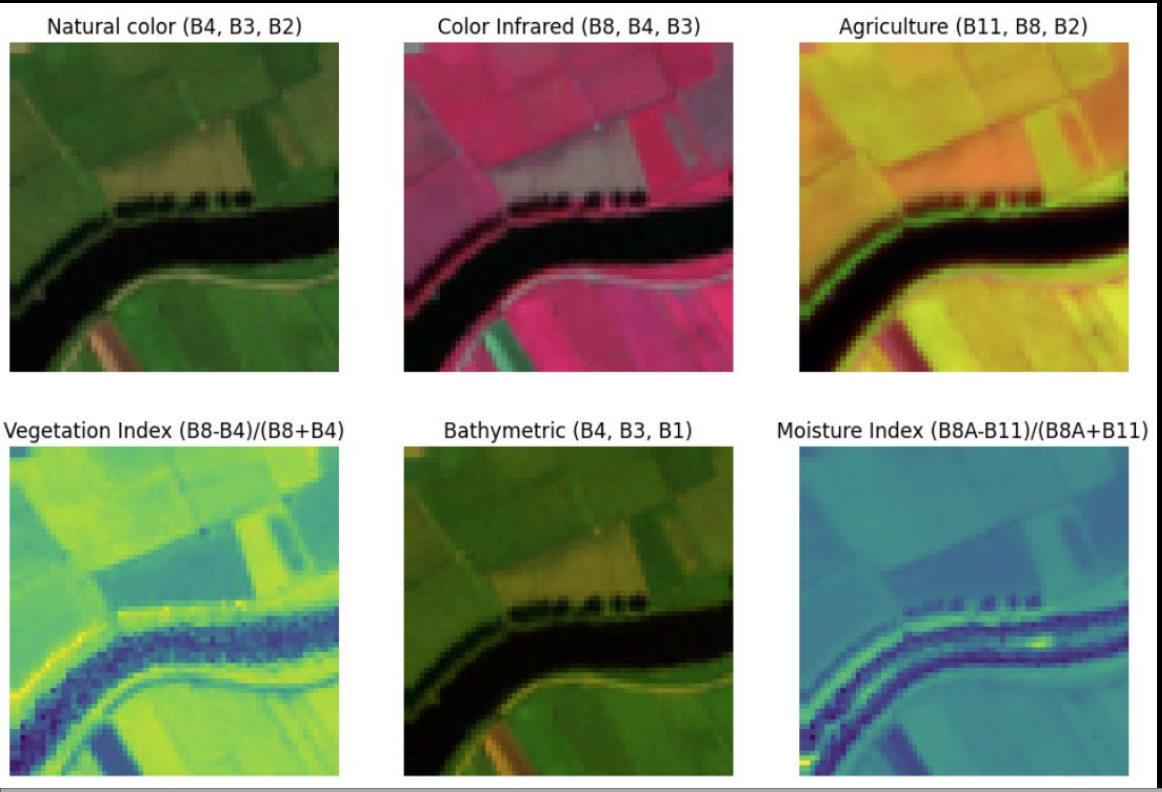
opernicus
Europe's eyes on Earth

PASMA MULTISPEKTRAL

Band	Resolution	Central Wavelength	Description
B1	60 m	443 nm	Ultra Blue (Coastal and Aerosol)
B2	10 m	490 nm	Blue
B3	10 m	560 nm	Green
B4	10 m	665 nm	Red
B5	20 m	705 nm	Visible and Near Infrared (VNIR)
B6	20 m	740 nm	Visible and Near Infrared (VNIR)
B7	20 m	783 nm	Visible and Near Infrared (VNIR)
B8	10 m	842 nm	Visible and Near Infrared (VNIR)
B8a	20 m	865 nm	Visible and Near Infrared (VNIR)
B9	60 m	940 nm	Short Wave Infrared (SWIR)
B10	60 m	1375 nm	Short Wave Infrared (SWIR)
B11	20 m	1610 nm	Short Wave Infrared (SWIR)
B12	20 m	2190 nm	Short Wave Infrared (SWIR)



KOMBINACJE PASM MULTISPECTRAL



Różne kombinacje pasm multispektralnych obrazują nam różne informacje, na przykład jakość wegetacji roślin, czy zawartość wody w komórkach roślin

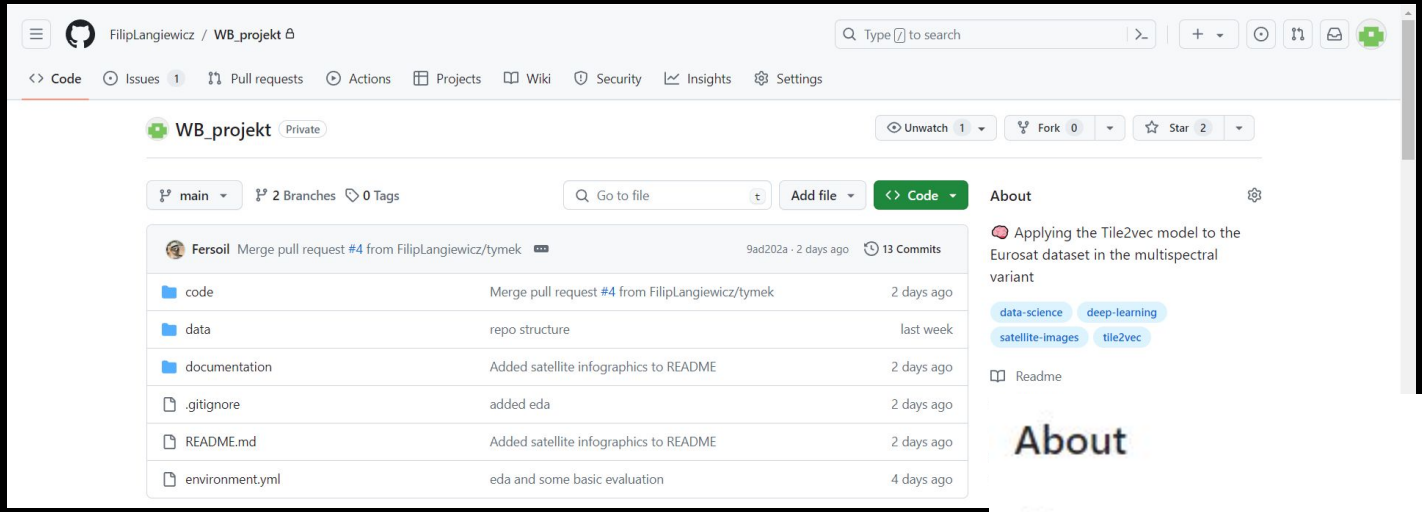
TESTOWANIE MODELU

Przetestowaliśmy model bez żadnych modyfikacji na naszych danych

70%

accuracy na 4 pasmach

Repo


FilipLangiewicz / WB_projekt
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Actions
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Security
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Fork 0
Star 2
main
2 Branches
0 Tags
Go to file
Add file
Code
About
Applying the Tile2vec model to the Eurosat dataset in the multispectral variant
data-science
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Readme
Fersoil Merge pull request #4 from FilipLangiewicz/tymek
9ad202a · 2 days ago
13 Commits
code Merge pull request #4 from FilipLangiewicz/tymek 2 days ago
data repo structure last week
documentation Added satellite infographics to README 2 days ago
.gitignore added eda 2 days ago
README.md Added satellite infographics to README 2 days ago
environment.yml eda and some basic evaluation 4 days ago


data-science
deep-learning
satellite-images
tile2vec


About
Applying the Tile2vec model to the Eurosat dataset in the multispectral variant

Podział zadań

preprocessing modelu - Tymek, Łukasz

output - Natalka, Maciek, Filip

inne modele - Filip

Dziękujemy za uwagę

I zapraszamy do śledzenia postępów naszej pracy
https://github.com/FilipLangiewicz/WB_projekt