

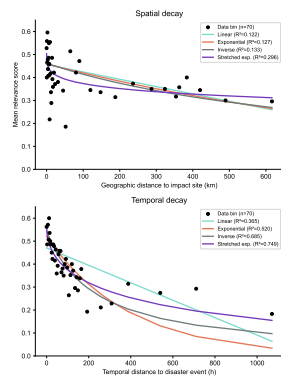
Reproducibility Review of: Towards Fine-grained Relevance Scoring of Social Media Posts in Disaster Response: A Decay-based Regression Approach



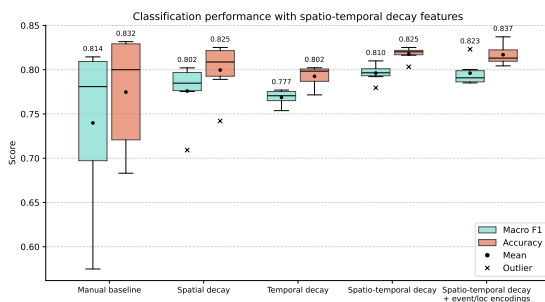
Item	Value
Title	Towards Fine-grained Relevance Scoring of Social Media Posts in Disaster Response: A Decay-based Regression Approach
Authors	David Hanny, Andreas Kramer, Ehsaneddin Jalilian, Sebastian Schmidt and Bernd Resch
Ref. paper	Hanny, D., Kramer, A., Jalilian, E., Schmidt, S., and Resch, B.: Towards Fine-grained Relevance Scoring of Social Media Posts in Disaster Response: A Decay-based Regression Approach, AGILE GIScience Ser., 7, 4, https://doi.org/10.5194/agile-giss-7-4-2026 , 2026.
Codechecker(s)	Sophie Teichmann
Date of Check	19-3-2026
Summary	Full reproduction
Repository	https://github.com/reproducible-agile/GSAI_PUBLIC_Multimodal_Relevance_Regression
Ref. certificate	10.17605/OSF.IO/ZPURT

Table 1: Reproduction metadata

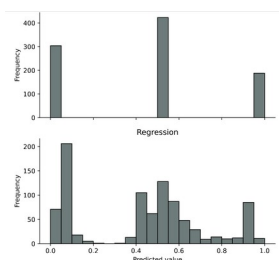
Output



Configuration	mean	median	max	std	lqr	hline	cv
sp	float64	float64	float64	float64	float64	float64	float64
Manual baseline	0.74	0.781	0.814	0.096	0.112	0.24	0.15
Spatial decay	0.776	0.785	0.802	0.054	0.02	0.095	0.044
Spatio-temporal decay	0.796	0.797	0.81	0.01	0.008	0.03	0.013
Spatio-temporal decay + event/loc encodings	0.796	0.791	0.825	0.015	0.013	0.038	0.018
Temporal decay	0.769	0.771	0.777	0.009	0.01	0.025	0.011



Model	Task	RMSE ↓	MAE ↓	R2 ↑	p ↑	M-F1 ↑	ACC ↑
Gradient boosting	Classification (baseline)	0.242	0.095	0.580	0.793	0.814	0.832
Random forest	Classification (decay-based)	0.244	0.094	0.572	0.790	0.823	0.837
SVR	Regression	0.231	0.147	0.617	0.771	0.781	0.812
Ridge regression	Regression	0.232	0.146	0.615	0.765	0.767	0.797
kNN	Regression	0.234	0.130	0.605	0.765	0.782	0.810
Random forest	Regression	0.265	0.196	0.495	0.681	0.697	0.737
Gradient boosting	Regression	0.287	0.190	0.410	0.674	0.703	0.739



name	unique_values	diff_entropy	gini_index	val1_gini_0.9	val1_gini_0.1
sp	int64	float64	float64	int64	int64
Classification	5	-22.858	0.441	188	304
Regression	914	-0.515	0.378	96	277

Comment

The reproduction of Figure 2 is found in the folder 'data/figures/decay_curves.pdf'

Table 2 was recreated using the interactive marimo notebook within the docker container 'edit-visualisations'.

The reproduction of Figure 3 is found in the folder 'data/figures/decay_feature_performance.pdf'.

Table 4 was recreated using the interactive marimo notebook within the docker container 'edit-visualisations'. All the values can be found either in 'data/output/decay_classif_eval.csv' or 'regression_eval.csv'

The reproduction of Figure 4 is found in the folder 'data/figures/prediction_histogram.pdf'.

Table 5 was recreated using the interactive marimo notebook within the docker container 'edit-visualisations'.

Table 2: Summary of output files generated

Summary

The intended reproduction pipeline worked flawless on my Ubuntu 22.04 machine. The pipeline was split into the experiments and the visualization. Both ran without any complications. The same holds for the interactive notebooks. To summarize this was a super easy reproduction.

Reproducibility reviewer notes

Installation prerequisites and computational environment

The only dependency is docker.

Running the code

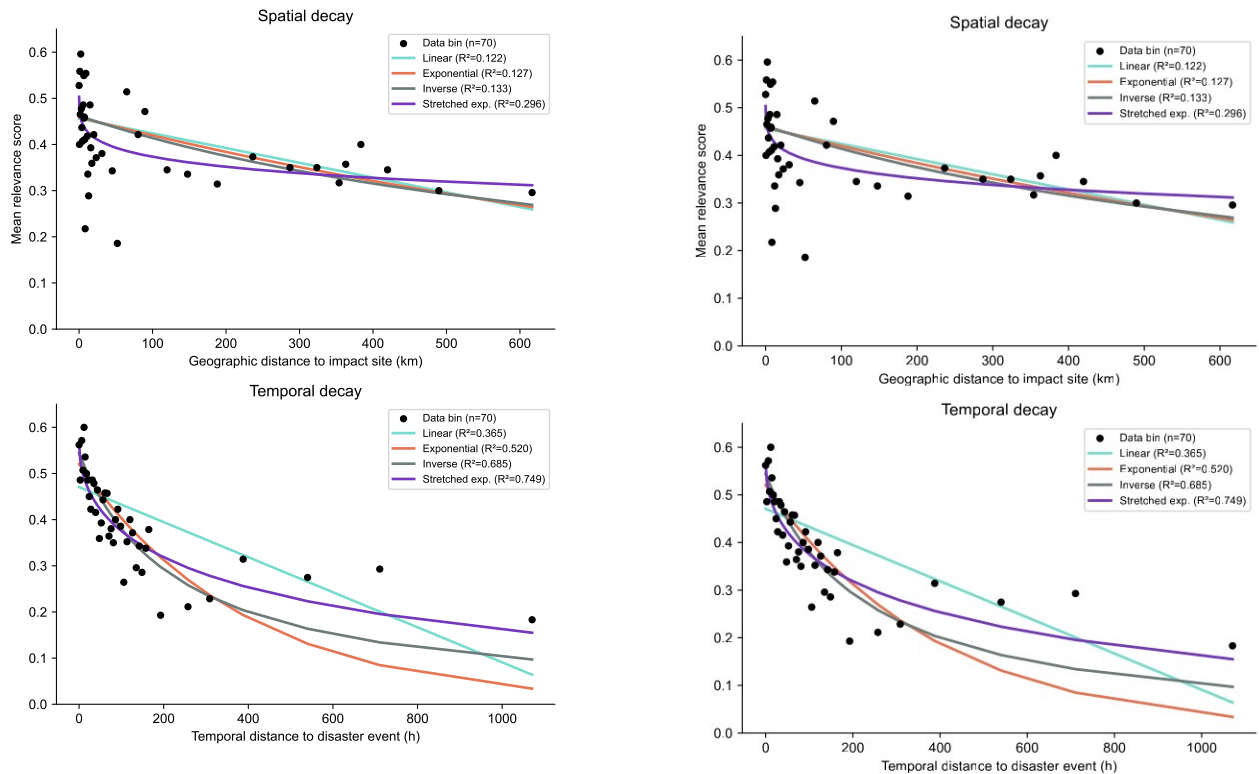
The pipeline is available as a docker image., separated in an experimental pipeline and visualization pipeline. For each of the pipelines they provide an interactive version of the pipeline via marimo.

Outputs and results

All these visualization and tables were generated using the interactive docker container 'edit-visualisations'. The only figure that was not reproducible, was Figure 5 which was created manually in QGIS.

Reproduction of Figure 2

The reproduced figure does not differ visually from the original Figure 2 (left reproduced, right original).



Reproduction of Table 3

The table above was generated using the interactive docker edit-visualisations. The results align perfectly with the original results below.

Configuration	mean	median	max	std	iqr	minmax	cv
str	float64	float64	float64	float64	float64	float64	float64
Manual baseline	0,74	0,781	0,814	0,096	0,112	0,24	0,13
Spatial decay	0,776	0,785	0,802	0,034	0,02	0,093	0,044
Spatio-temporal decay	0,796	0,797	0,81	0,01	0,008	0,03	0,013
Spatio-temporal decay + event/loc encodings	0,796	0,791	0,823	0,015	0,013	0,038	0,018
Temporal decay	0,769	0,771	0,777	0,009	0,01	0,023	0,011

5 rows, 7 columns

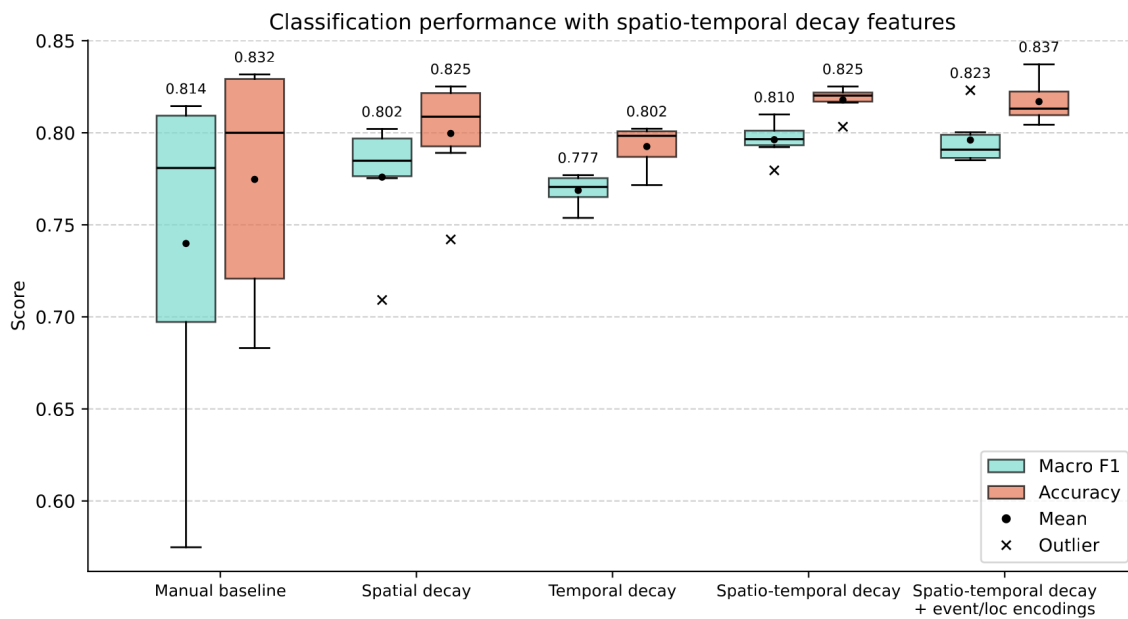
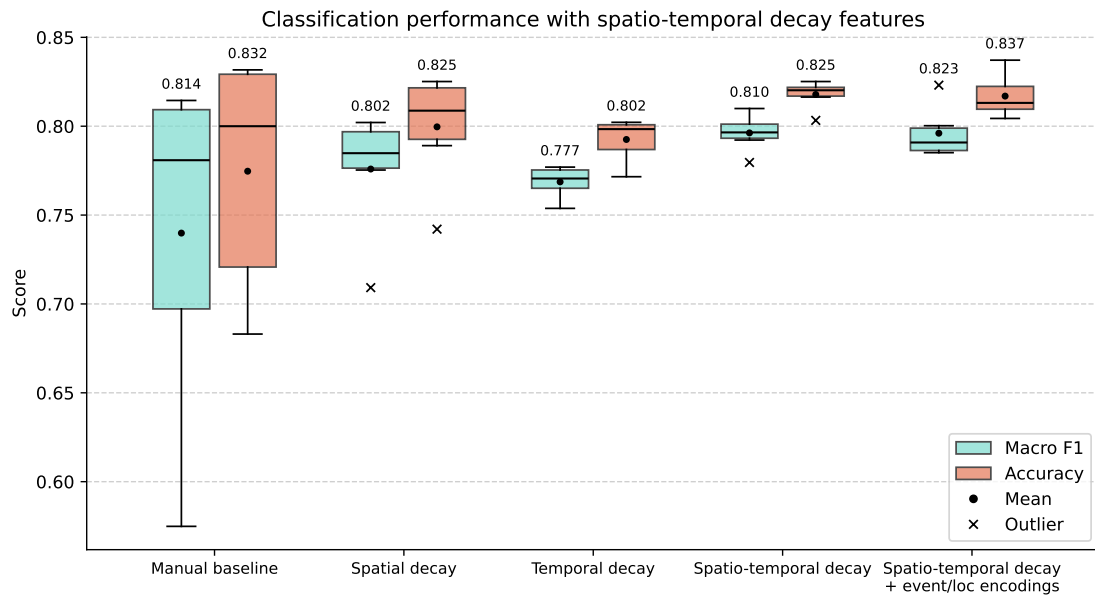
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Download

Configuration	Mean ↑	Std. ↓	Range ↓	CV ↓
Manual baseline	0.740	0.096	0.240	13.0%
Spatial decay	0.776	0.034	0.093	4.4%
Temporal decay	0.769	0.009	0.023	1.1%
Spatio-temporal decay	0.796	0.010	0.030	1.3%
Spatio-temporal decay + event/loc encodings	0.796	0.015	0.038	1.8%

Reproduction of Figure 3

There is no visual difference between the reproduced (above) and the original (below)



Reproduction of Table 4

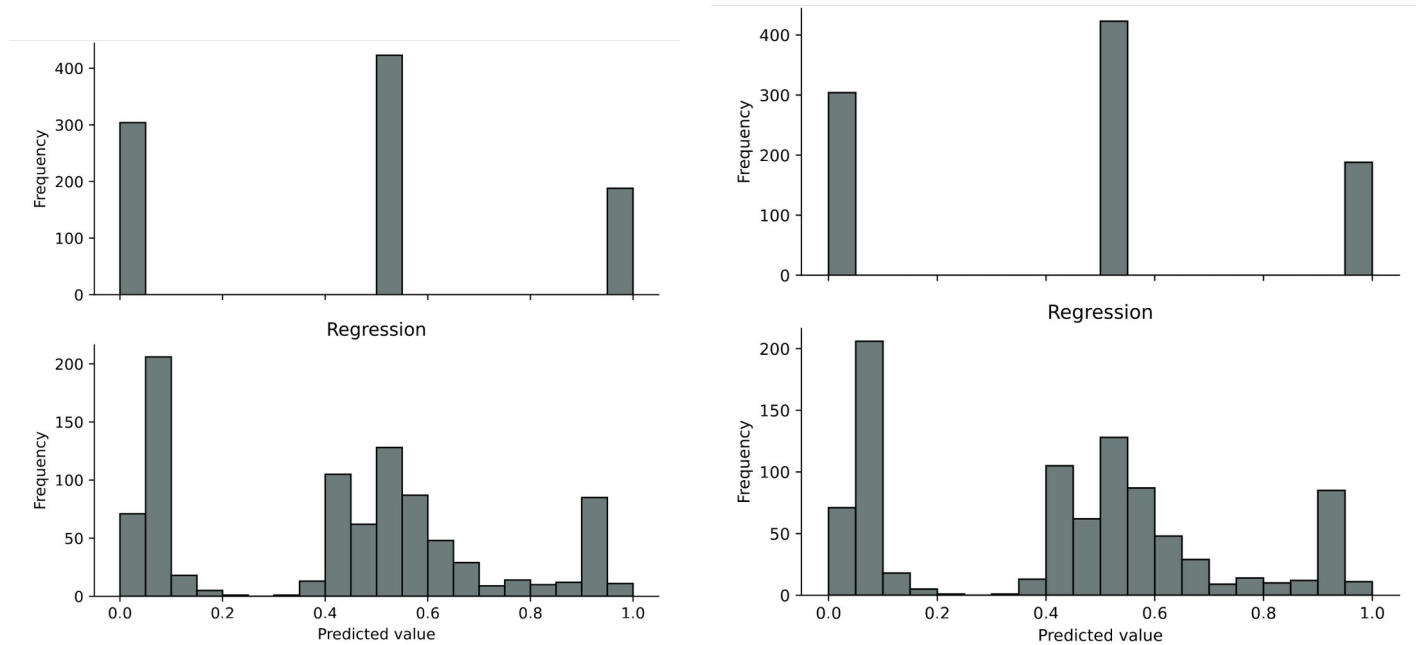
The results of the reproduction above align perfectly with the original values below

Model	Task	RMSE ↓	MAE ↓	R2 ↑	ρ ↑	M-F1 ↑	ACC ↑
Gradient boosting	Classification (baseline)	0.242	0.095	0.580	0.793	0.814	0.832
Random forest	Classification (decay-based)	0.244	0.094	0.572	0.790	0.823	0.837
SVR	Regression	0.231	0.147	0.617	0.771	0.781	0.812
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Random forest	Regression	0.265	0.196	0.495	0.681	0.697	0.737
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Model	Task	RMSE ↓	MAE ↓	R ² ↑	ρ ↑	M-F1 ↑	ACC ↑
Gradient boosting	Classification (baseline)	0.242	<u>0.095</u>	0.580	0.793	<u>0.814</u>	<u>0.832</u>
Random forest	Classification (decay-based)	0.244	0.094	0.572	<u>0.790</u>	0.823	0.837
SVR	Regression	0.231	0.147	0.617	0.771	0.781	0.812
Ridge regression	Regression	<u>0.232</u>	0.146	<u>0.615</u>	0.765	0.767	0.797
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Random forest	Regression	0.265	0.196	0.495	0.681	0.697	0.737
Gradient boosting	Regression	0.287	0.190	0.410	0.674	0.703	0.739

Reproduction of Figure 4

The reproduced figure does not differ visually from the original Figure 4 (left reproduced, right original).



Reproduction of Table 5

The results above were generated using the interactive docker environment. The results align nicely between the reproduced above and the original below.

name str	unique_values int64	diff_entropy float64	gini_index float64	vals_geq_0.9 int64	vals_leq_0.1 int64
Classification	3	-22,838	0,441	188	304
Regression	914	-0,515	0,378	96	277

Method	Unique values ↑	Entropy ↑	Gini index ↓
Classification	3	$-\infty$	0.441
Regression	914	-0.515	0.378

Citing this document

This report is part of the reproducibility review at the AGILE conference. For more information see <https://reproducible-agile.github.io/>. This document is published on OSF/RE at 10.17605/OSF.IO/ZPURT

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