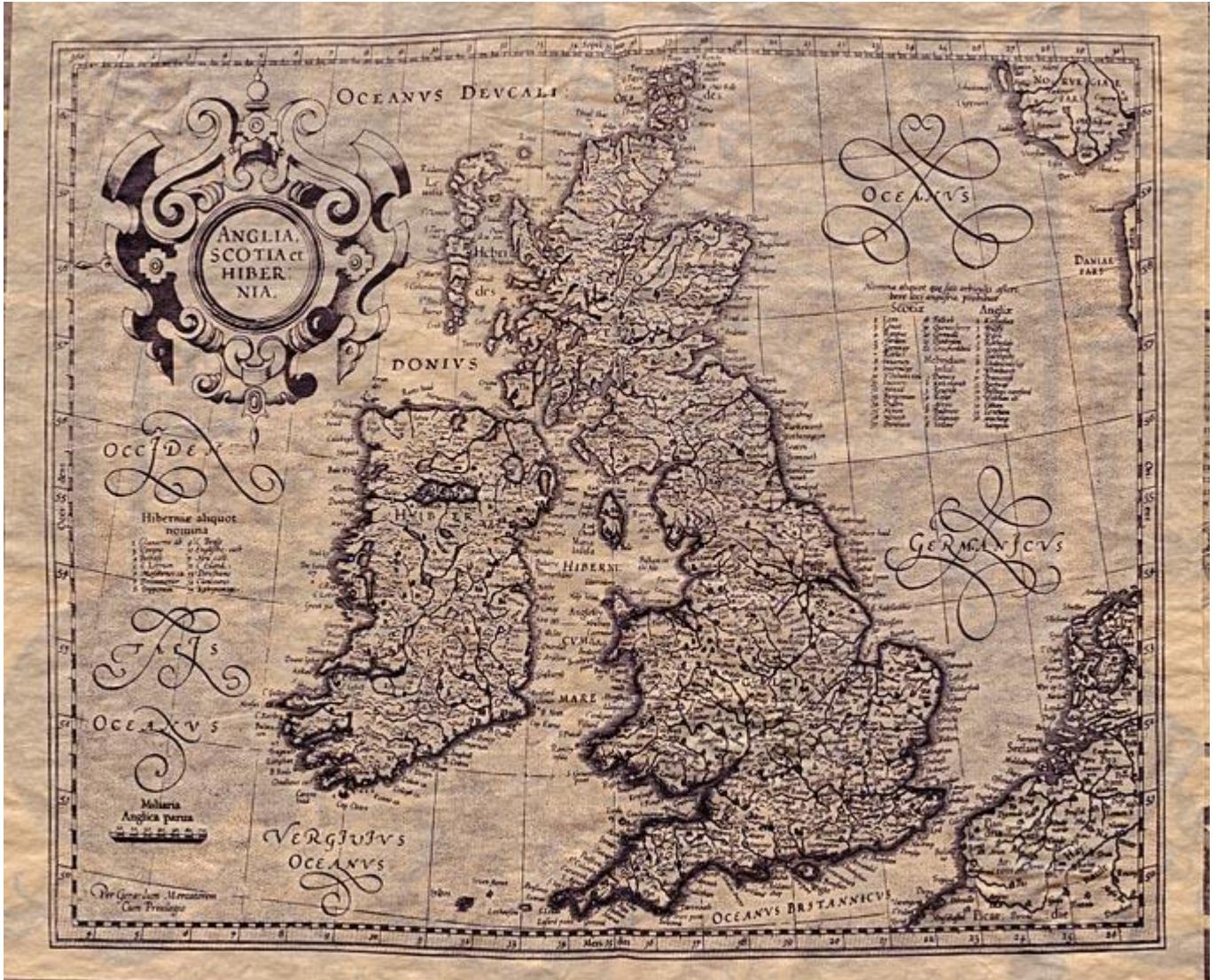


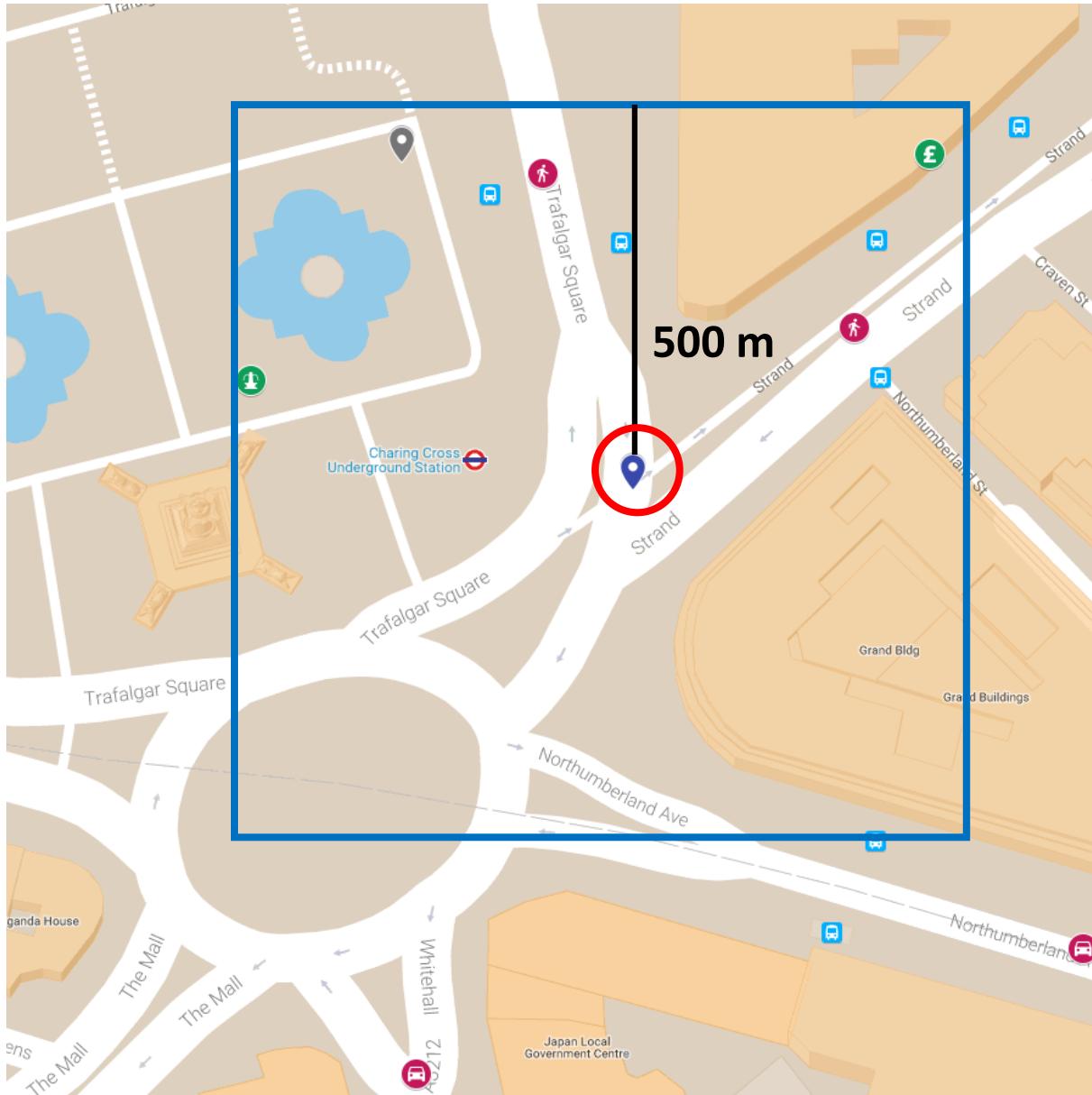
# Crimes in the UK

Week 05 – 14.12.2016

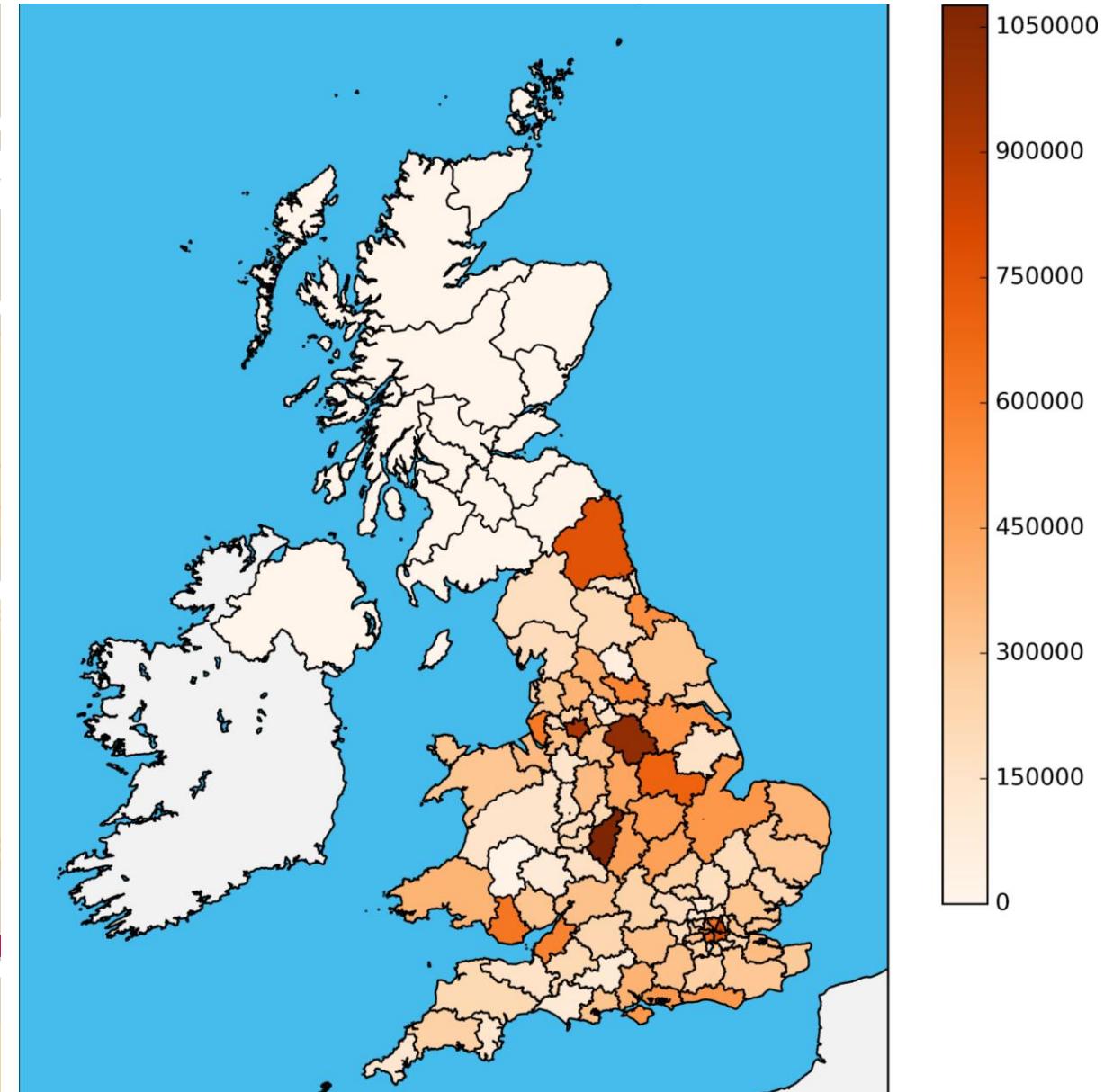
Sergiu Soima  
Chaoran Chen  
Aser Abdelrahman



# Data up to now

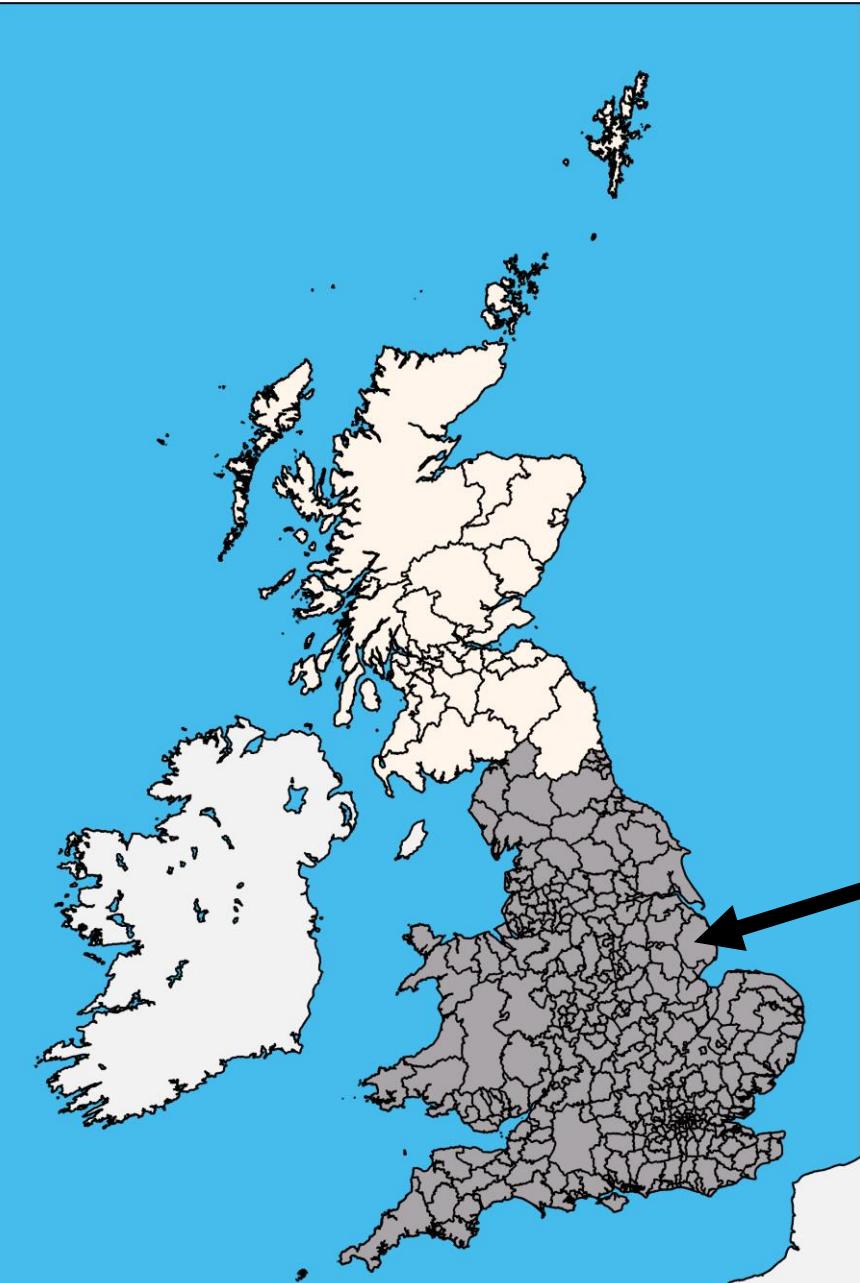


Stop and Searches, and Point of Interest surrounding crimes



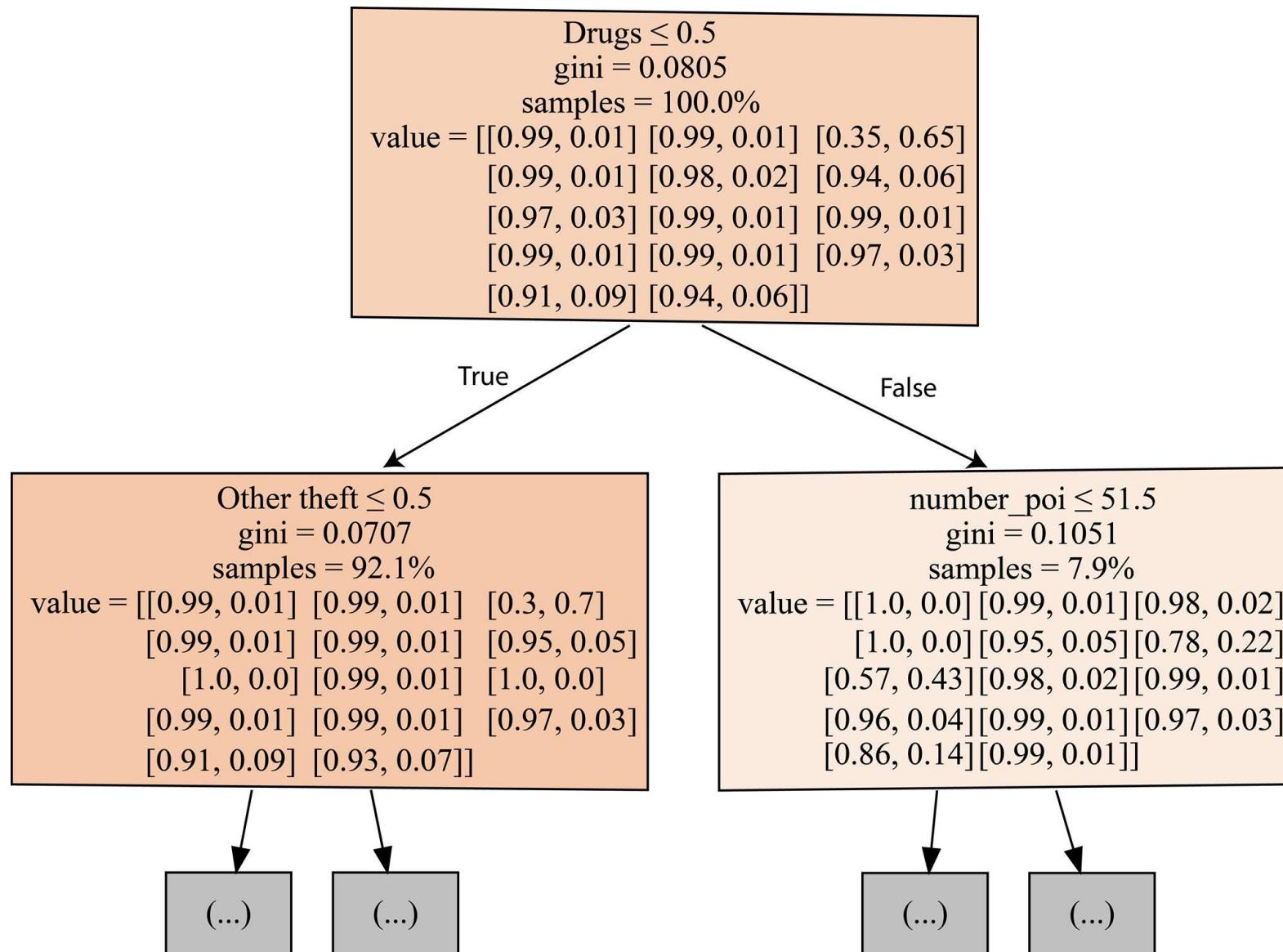
Number of Crimes in Postcode Areas

# Local Authority Areas



- Total number of persons
- Gender
- Age groups
- Loving arrangements
- Ethnic groups
- Household languages
- Religion
- Number of cars
- Qualifications
- Length of residence in UK

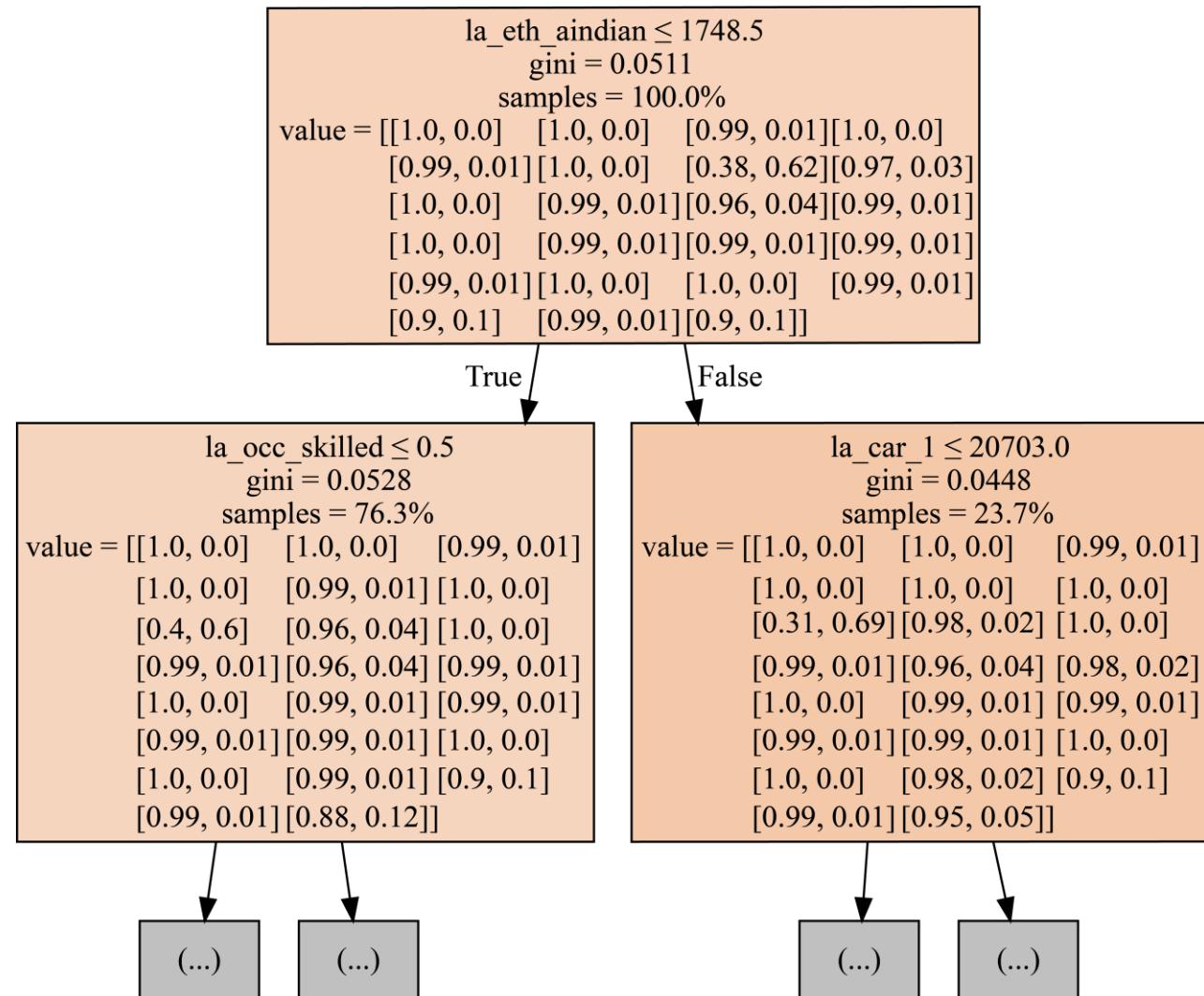
# Follow up: First Approach for Predicting Crime Outcome Types (1)



- 10 decision trees in the forest
- cross validation score: 59.0%
- Accuracy of test data: 95.9%
- Weighted F1-score 0.7647

# Follow up: First Approach for Predicting Crime Outcome Types (2)

- Classifier: Random Forest
- Sample subset: Only the city of London (~ 5M samples)
- Feature subset: {Crime type, postcode, local authority, number of POIS, Outcome types of stop& search incidents, demographical location data}
- Prediction goal: crime outcome type



# Follow up: First Approach for Predicting Crime Outcome Types (2)

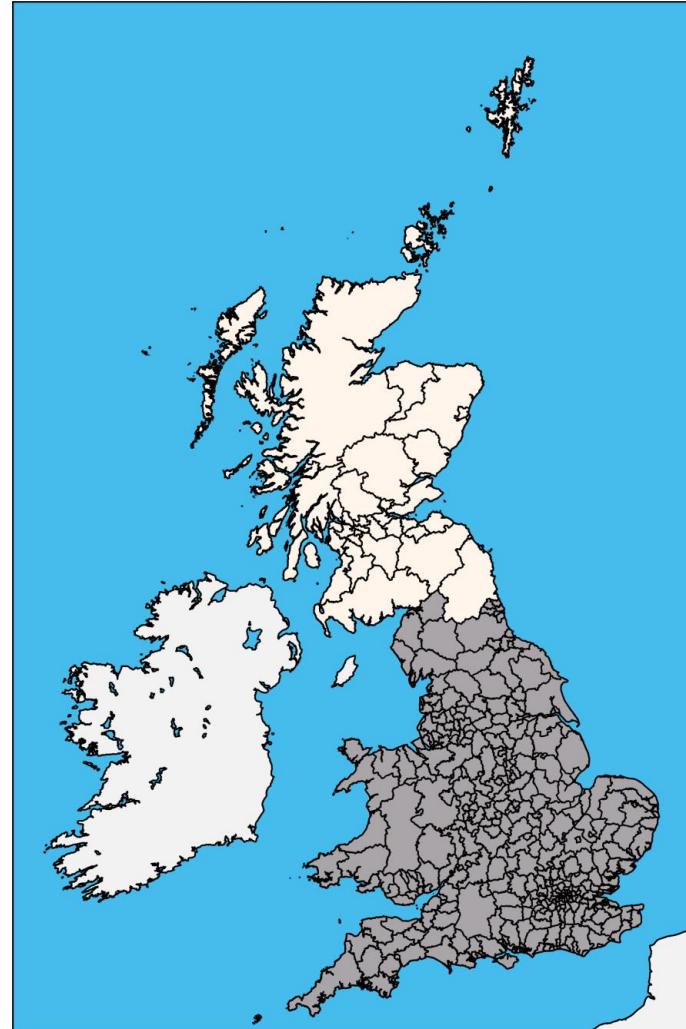
cross validation score: 54.8%

Accuracy of test data: 55.2%

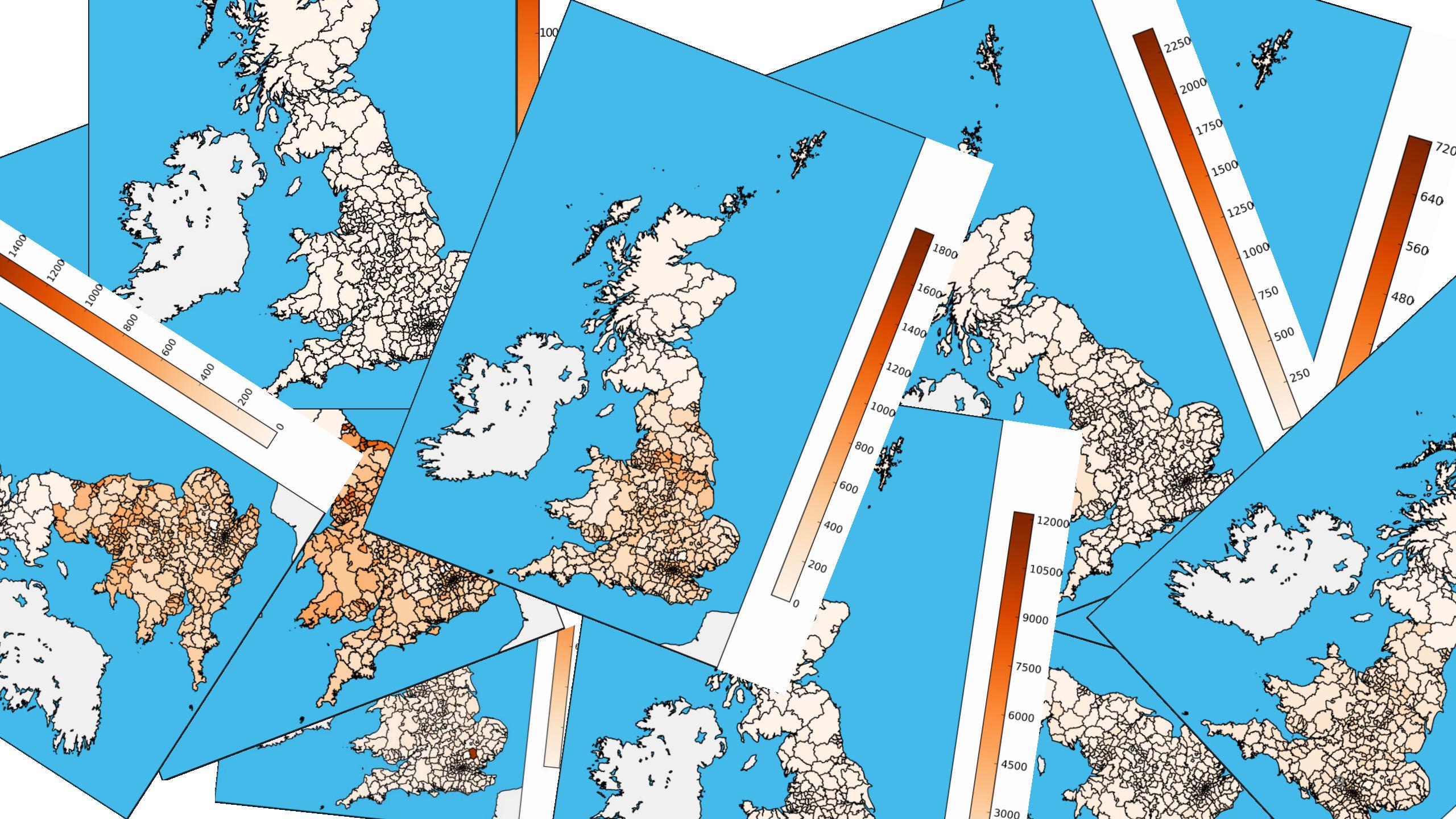
Weighted F1-score 0.544

Outcome type	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23		Nr.:	Outcome type
1	175	0	2	0	2	0	78	5	0	0	10	0	0	3	0	0	0	0	0	1	22	0	139		1	Action to be taken by another organisation
2	884	16	7	0	4	0	1173	28	0	3	37	14	0	11	3	9	6	0	1	15	138	4	189		2	Court case unable to proceed
3	1568	10	49	0	8	0	2439	56	0	12	98	12	0	30	7	13	6	2	2	27	302	0	496		3	Defendant found not guilty
4	29	0	0	0	0	0	18	1	0	0	1	1	0	0	0	1	0	0	0	1	7	1	2		4	Defendant sent to Crown Court
5	1792	0	6	0	88	0	1134	62	0	5	50	18	0	8	6	9	2	0	0	10	226	3	694		5	Formal action is not in the public interest
6	46	1	0	0	0	0	30	0	0	0	3	0	0	0	0	1	0	0	0	0	6	0	12		6	Further investigation is not in the public interest
7	43641	250	551	4	281	3	317898	2039	1	293	2463	344	5	699	266	237	253	46	78	840	7934	514	10604		7	Investigation complete
8	8603	26	40	1	65	0	7868	942	0	28	251	117	2	67	29	43	21	5	10	47	659	14	1747		8	Local resolution
9	113	0	0	1	0	0	13	4	1	3	11	25	0	0	2	5	1	0	0	1	25	0	0		9	Offender deprived of property
10	2299	7	12	0	11	0	1400	39	2	40	155	199	0	30	18	63	8	0	5	25	333	4	219		10	Offender fined
11	10158	28	63	0	42	3	9119	304	9	96	1333	589	1	118	55	166	33	3	8	77	1445	5	1863		11	Offender given a caution
12	4639	16	11	0	10	0	507	66	7	98	499	1992	0	40	25	230	12	1	4	45	640	1	44		12	Offender given a drugs possession warning
13	64	0	0	0	2	0	38	0	0	0	5	7	0	1	0	1	0	0	0	4	10	0	11		13	Offender given absolute discharge
14	3396	8	23	0	10	0	3327	111	2	24	145	72	0	65	15	24	13	1	3	25	457	11	501		14	Offender given community sentence
15	1787	3	6	0	9	0	1288	34	1	21	78	64	0	11	16	24	4	0	3	13	202	2	181		15	Court result unavailable
16	4173	9	4	0	6	0	1026	61	2	36	161	362	0	27	11	284	4	1	3	29	366	2	112		16	Offender given penalty notice
17	1404	2	10	0	3	1	1245	31	0	14	67	32	0	15	4	12	12	1	5	10	203	6	202		17	Court result unavailable
18	172	0	1	0	0	0	273	4	0	1	7	0	0	1	2	1	0	1	1	4	21	2	17		18	Offender ordered to pay compensation
19	499	2	6	0	4	0	447	12	0	3	22	5	0	4	4	1	1	1	1	8	89	2	68		19	Offender otherwise dealt with
20	3983	9	29	1	14	0	3914	84	1	9	110	76	1	38	16	19	14	0	8	96	577	7	376		20	Offender sent to prison
21	24440	97	187	1	159	5	24089	600	8	185	1149	756	4	291	115	270	110	16	36	314	4793	60	4773		21	Court case unable to proceed
22	874	1	4	0	1	0	2360	12	0	2	7	3	0	7	2	0	1	0	1	17	94	101	31		22	Suspect charged as part of another case
23	21671	68	150	2	258	3	20054	769	0	76	694	71	0	200	55	56	70	6	20	146	2742	22	17043		23	Unable to prosecute suspect

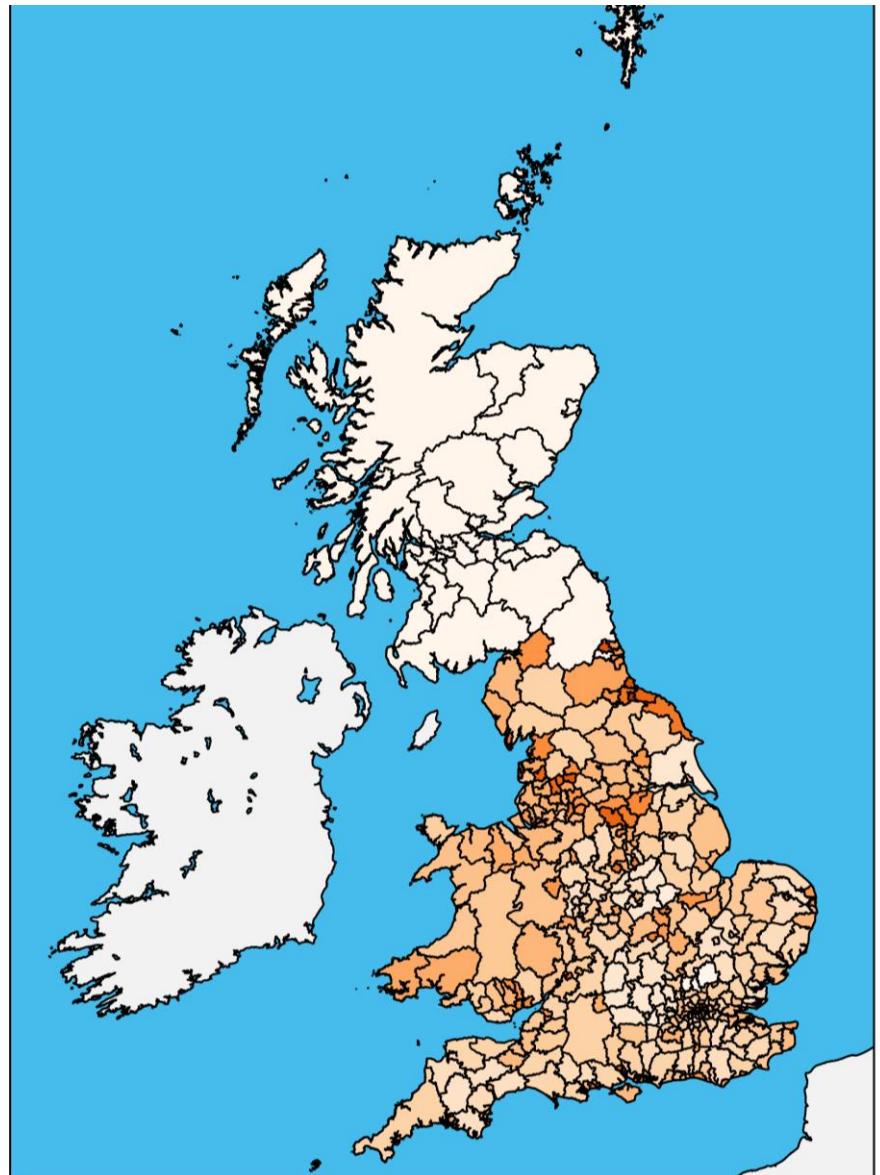
# Basis for new approaches



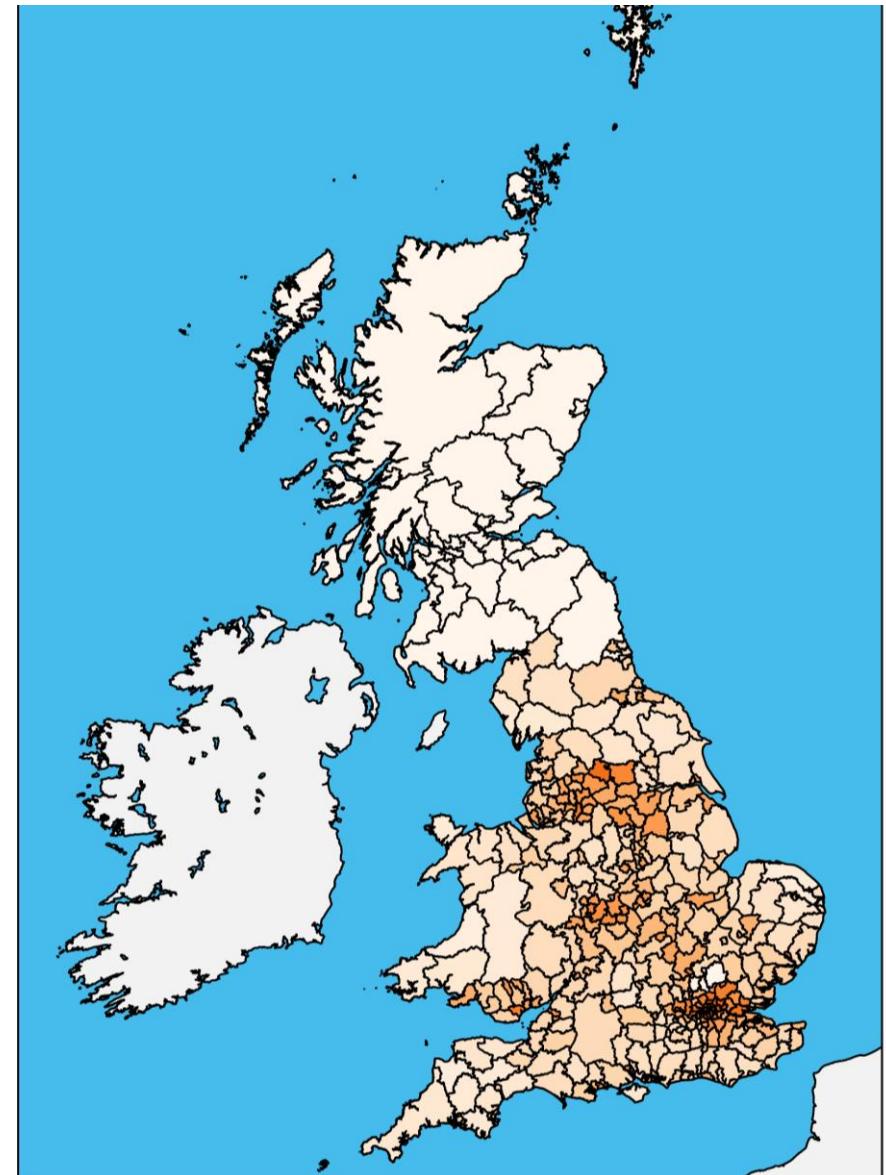
# Correlation Matrix



# Number Crimes per 10,000 Persons



Anti Social Behavior



Vehicle Crime

## Future Plans:

- Analysis and predictions from a new angle - namely location based
- Data transformation: In order to fulfill the location based approach, we will work on the possible feature transformation and data preparation.