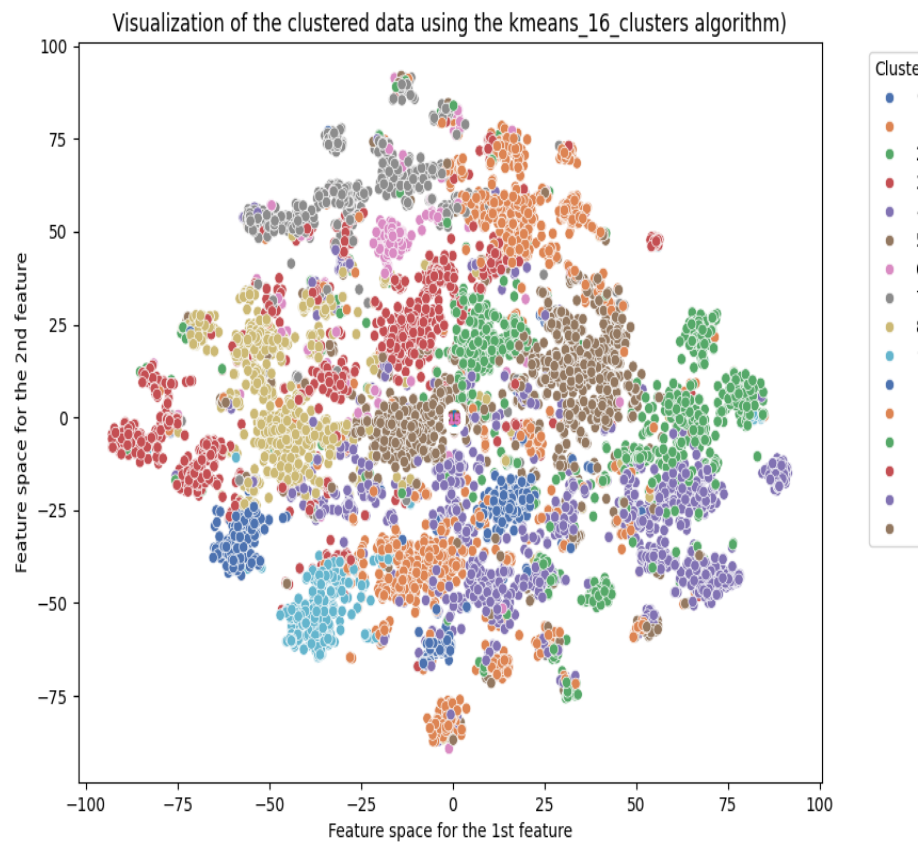


Clusters created by the kmeans_16_clusters algorithm



Cluster 0:

- network 2415
- wireless 685
- spectrum 453
- learning 409
- application 366
- design 338
- technology 312
- communication 303
- algorithm 265
- method 252
- device 248
- approach 239
- information 233
- social 231
- analysis 230
- resource 218
- framework 205
- challenge 204

access 201
community 200

Cluster 1:

learning 2668
algorithm 1520
method 1355
problem 1195
machine 1120
human 1000
application 919
language 834
robot 804
approach 757
information 727
task 727
computational 726
analysis 707
technique 706
design 680
tool 653
ai 638
understanding 635
work 607

Cluster 2:

engineering 1450
education 1391
community 1346
workshop 1255
conference 1199
university 1144
faculty 1138
field 1070
career 1038
undergraduate 985
opportunity 962
experience 928
professional 911
researcher 906
training 888
group 869
participant 866
technology 842
college 831
provide 823

Cluster 3:

cell 3246

protein 1629
tissue 717
function 666
understanding 563
cellular 554
process 544
biological 543
molecular 535
mechanism 522
structure 513
gene 509
provide 489
biology 482
undergraduate 465
method 425
approach 419
interaction 411
high 394
activity 392

Cluster 4:

technology 1297
design 1250
application 1122
device 911
computing 893
user 865
software 852
control 744
tool 712
power 691
performance 665
approach 653
technique 651
security 624
provide 613
information 592
proposed 592
energy 588
sensor 584
learning 559

Cluster 5:

social 2359
community 1586
health 1398
public 1134
policy 1102

pandemic 1095
risk 981
information 936
change 894
people 847
understanding 839
response 827
behavior 801
work 750
individual 724
decision 680
provide 631
economic 627
state 623
effect 621

Cluster 6:

water 2043
process 272
technology 268
change 226
understanding 217
surface 211
treatment 191
quality 190
community 184
goal 179
soil 177
membrane 175
environmental 171
provide 167
potential 158
result 157
chemical 156
knowledge 156
high 154
drinking 147

Cluster 7:

ocean 1759
change 1480
climate 1337
carbon 998
understanding 956
process 928
earth 926
global 823
ice 817

community 768
soil 743
provide 667
result 640
water 632
earthquake 631
surface 608
temperature 608
record 592
region 582
sea 563

Cluster 8:

material 4871
property 1653
chemical 1335
structure 1311
process 1253
energy 1182
design 1117
polymer 1111
chemistry 1083
application 1021
high 985
understanding 956
manufacturing 915
metal 892
fundamental 861
undergraduate 838
technology 828
device 820
engineering 798
university 781

Cluster 9:

theory 1396
problem 925
geometry 730
equation 723
group 626
pi 621
space 589
mathematical 531
application 465
structure 459
geometric 458
field 427
question 421

- method 414
- algebraic 411
- mathematics 408
- number 400
- area 384
- analysis 380
- solution 363

Cluster 10:

- quantum 3044
- material 656
- state 377
- physic 362
- information 342
- technology 339
- computer 318
- property 301
- computing 289
- device 288
- pi 283
- theory 267
- field 260
- algorithm 248
- electron 245
- application 229
- fundamental 204
- theoretical 197
- interaction 194
- topological 193

Cluster 11:

- specie 1979
- plant 1599
- change 1099
- community 871
- understanding 738
- gene 721
- population 710
- ecosystem 701
- environmental 645
- training 625
- environment 604
- provide 581
- human 574
- biology 561
- fellow 550
- undergraduate 538
- interaction 532

evolution 529
researcher 515
trait 511

Cluster 12:

virus 1181
disease 893
infection 532
viral 481
spread 475
coronavirus 435
transmission 431
pandemic 398
rapid 373
health 372
public 333
human 327
provide 315
pathogen 304
host 303
understanding 296
novel 272
result 272
outbreak 267
community 266

Cluster 13:

particle 1044
flow 896
physic 850
wave 826
understanding 782
field 736
energy 668
experiment 638
simulation 628
process 614
measurement 599
star 581
work 580
provide 533
undergraduate 511
matter 503
observation 494
interaction 492
method 488
fluid 486

Cluster 14:

stem 5234
learning 2969
teacher 2609
education 2206
school 1397
community 1283
practice 1281
engineering 1212
undergraduate 1134
experience 1124
course 1106
university 1046
mathematics 1042
teaching 1026
knowledge 961
college 887
career 878
professional 871
faculty 847
need 847

Cluster 15:

phase 1172
small 996
technology 990
business 952
innovation 948
sbir 860
proposed 718
potential 670
patient 669
broader 599
cost 495
device 441
process 344
application 330
novel 329
advance 311
material 297
solution 297
treatment 296
high 290