

Software Verification and Validation Research Laboratory (SVVRL) of the University of Kentucky: Traceability Challenge

Jane Huffman Hayes, Wei-Keat Kong, Wenbin Li, Hakim Sultanov, Steven Alexander Wilson, Sami Taha, Jody Larsen, Senthil Sundaram¹

University of Kentucky, ¹Microsoft

{hayes,weikeat.kong,wenbin.li,hakim.sultanov,sami.taha,jody.larsen}@uky.edu,¹k.s.Senthil@microsoft.com, steven.alexander.wilson@gmail.com

Abstract

We present the process and methods applied in undertaking the Traceability Challenge. Information retrieval methods implemented in REquirements TRacing On target (RETRO) were applied to the tracing of the EasyClinic dataset. Preliminary results based on a manually generated answer set are presented along with ranked lists for scoring.

1. Introduction

Tracing pairs of textual software engineering artifacts is an important yet challenging undertaking. It is important because the resulting requirements traceability matrix is the basis for a myriad of activities such as change impact analysis, satisfaction assessment, reverse engineering, reuse, etc. Tracing is challenging because text artifacts are unstructured; have been written by different authors and use different terminology; are at different abstraction levels; and can constitute a huge search space.

When automation is introduced, several new challenges appear: lack of data sets with true or known answer sets make validation and comparison of automated tools difficult, information retrieval (IR) techniques suffer from low precision, even more sophisticated techniques such as latent semantic indexing (LSI) or natural language processing (NLP) rules-based approaches require an analyst's approval.

The Center of Excellence for Software Traceability (COEST) developed a set of Grand Challenges for Traceability (GCT) [5] and identified lack of benchmarks and tracing datasets as a barrier to advances in automated tracing. The Traceability Challenge represents an advance toward this grand challenge.

The University of Kentucky SVVRL presents its challenge results here. Our paper is organized as follows. Section 2 explains the process applied by

SVVRL in pursuing the challenge. Section 3 describes methods used to trace the Challenge dataset. Section 4 provides preliminary results, determined using our own manually generated answer set. Finally, Section 5 provides conclusions and future work. The appendices include a table of rank ordered returned links for each of the methods applied to each artifact pair.

2. Process for Traceability Challenge

We took the EasyClinic dataset and asked an analyst to develop an answer set for the code classes to use cases (CCtoUC) trace and an answer set for the code classes to test cases (CCtoTC) trace. One analyst converted the EasyClinic dataset into the format required by our tool REquirements TRacing On target (RETRO) and the newest version of the tool called RETRO.NET. A third analyst used a tool called Thesaurus Builder (developed at UK) and created a thesaurus for each of the three artifacts. A set of analysts then applied several methods to the dataset: Term Frequency-Inverse Document Frequency (TF-IDF), TF-IDF with thesaurus, and TF-IDF with standard Rocchio feedback [4,3]. Preliminary results of each run were compared to the answer set and recall and precision values were derived. Based on this, we adjusted filtering levels and then decided on the methods which would be submitted. The same process was applied to the Italian and English dataset.

3. Tracing methods

We performed stopword removal and stemming [1]. We used the vector space model [2] and applied TF-IDF weighting [3]. Thesaurus Builder was used to generate a thesaurus, it uses Wordnet to determine possible synonyms for artifact terms. When tracing, filtering ranged from 0.1 to 0.4.

For analyst feedback, the Rocchio feedback algorithm [4] was used. Our answer set served as the

analyst providing perfect feedback. We simulated enough iterations of analyst feedback to examine 20% of all possible links, evaluating the top 2 previously unseen links each time.

Although there were some small differences in the links returned from RETRO and RETRO.NET, results presented here are only from RETRO.NET.

4. Preliminary results

The RETRO.NET results were compared to the answer set to determine recall and precision values with filtering at a 0.2 threshold (shown in Table 1). Comparing TF-IDF with feedback to TF-IDF, CCtoUC recall improved from 62-73% to 83-88%, whereas CCtoUC precision decreased from 50-68% to 31-41%. CCtoTC recall improved from 34-43% to 87-88% and precision increased from 49-57% to 91-95%. TF-IDF with thesaurus did not yield significant differences and is not reported. Figure 1 shows the effect of filtering for one of the cases.

Table 1. Preliminary Results for RETRO.NET.

<u>Artifact pair</u>	<u>Method</u>	<u>Feedback loops</u>	<u>Recall</u>	<u>Precision</u>
English CCtoUC	TF-IDF	N/A	73%	50%
English CCtoUC	TF-IDF with feedback	3 loops	88%	31%
Italian CCtoUC	TF-IDF	N/A	62%	68%
Italian CCtoUC	TF-IDF with feedback	3 loops	83%	41%
English CCtoTC	TF-IDF	N/A	43%	49%
English CCtoTC	TF-IDF with feedback	6 loops	88%	95%
Italian CCtoTC	TF-IDF	N/A	34%	57%
Italian CCtoTC	TF-IDF with feedback	6 loops	87%	91%

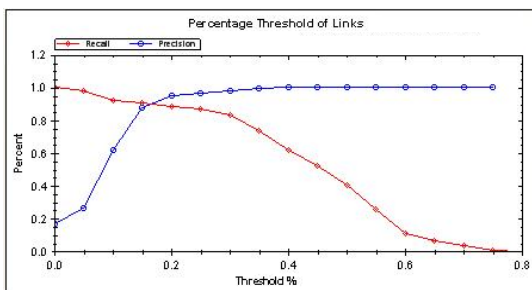


Figure 1. Recall and Precision for TF-IDF with feedback, English CCtoTC, 6 loops.

5. Conclusions and future work

We noted a number of interesting items in the EasyClinic dataset. First, there were a few Italian terms that remained in the English dataset. Second, there was a lack of punctuation in the dataset that made it difficult to trace manually. In addition, words were not organized into completed sentences and seemed to have been extracted from tables.

Based on our preliminary results, we noted that the optimal threshold varied depending on the artifact pair. The CCtoUC pairs have generally high recall with precision improving as filtering goes from 0.2 to 0.4. The CCtoTC pairs have generally high precision with recall getting worse from 0.2 to 0.4.

We note that our results are very similar for English and Italian. This is an encouraging sign (though not unexpected) for global application of our techniques, regardless of the language of the artifacts.

6. Acknowledgments

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7. References

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Appendix A. TF-IDF English CCtoUC

Rank	Source	Target	Similarity
1	146.txt	6.txt	0.711
2	146.txt	5.txt	0.701
3	130.txt	29.txt	0.689
4	147.txt	3.txt	0.683
5	129.txt	30.txt	0.649
6	114.txt	25.txt	0.624
7	138.txt	22.txt	0.617
8	153.txt	6.txt	0.609
9	158.txt	3.txt	0.606
10	147.txt	2.txt	0.593
11	132.txt	20.txt	0.581
12	123.txt	3.txt	0.580
13	124.txt	6.txt	0.566
14	158.txt	2.txt	0.553
15	117.txt	22.txt	0.549
16	122.txt	6.txt	0.548
17	118.txt	21.txt	0.544
18	144.txt	25.txt	0.533
19	146.txt	4.txt	0.531
20	121.txt	19.txt	0.525
21	122.txt	3.txt	0.506
22	128.txt	26.txt	0.505
23	152.txt	7.txt	0.505
24	123.txt	2.txt	0.491
25	132.txt	25.txt	0.489
26	141.txt	13.txt	0.487
27	158.txt	1.txt	0.473
28	127.txt	28.txt	0.471
29	138.txt	16.txt	0.466
30	147.txt	1.txt	0.463
31	120.txt	7.txt	0.457
32	148.txt	29.txt	0.457
33	124.txt	5.txt	0.453
34	143.txt	30.txt	0.451
35	141.txt	12.txt	0.450
36	134.txt	22.txt	0.447
37	153.txt	5.txt	0.445
38	122.txt	2.txt	0.443
39	134.txt	15.txt	0.433
40	122.txt	5.txt	0.433
41	140.txt	10.txt	0.432
42	140.txt	9.txt	0.428
43	137.txt	25.txt	0.428
44	114.txt	20.txt	0.425
45	126.txt	26.txt	0.424
46	155.txt	8.txt	0.424
47	117.txt	16.txt	0.423
48	141.txt	9.txt	0.421
49	159.txt	22.txt	0.420
50	150.txt	27.txt	0.417
51	134.txt	16.txt	0.414
52	144.txt	20.txt	0.411
53	159.txt	16.txt	0.405
54	119.txt	9.txt	0.404
55	116.txt	17.txt	0.402
56	148.txt	15.txt	0.400
57	148.txt	16.txt	0.394
58	140.txt	27.txt	0.392
59	126.txt	28.txt	0.388
60	119.txt	21.txt	0.388
61	115.txt	21.txt	0.386
62	155.txt	9.txt	0.385
63	156.txt	9.txt	0.384
64	122.txt	1.txt	0.383
65	156.txt	11.txt	0.380
66	122.txt	4.txt	0.379
67	141.txt	11.txt	0.378
68	126.txt	27.txt	0.377
69	117.txt	15.txt	0.375
70	123.txt	1.txt	0.374
71	139.txt	22.txt	0.374
72	138.txt	15.txt	0.373
73	127.txt	26.txt	0.373
74	134.txt	26.txt	0.370
75	139.txt	16.txt	0.370
76	156.txt	13.txt	0.367
77	133.txt	15.txt	0.365
78	128.txt	28.txt	0.364
79	159.txt	15.txt	0.359
80	148.txt	22.txt	0.358
81	133.txt	22.txt	0.357
82	116.txt	23.txt	0.356
83	156.txt	12.txt	0.356
84	134.txt	14.txt	0.355
85	153.txt	4.txt	0.354
86	156.txt	8.txt	0.347
87	127.txt	27.txt	0.343
88	155.txt	27.txt	0.343
89	115.txt	19.txt	0.342
90	120.txt	25.txt	0.342
91	133.txt	16.txt	0.342
92	150.txt	9.txt	0.340
93	134.txt	30.txt	0.336
94	119.txt	10.txt	0.335
95	119.txt	8.txt	0.332
96	137.txt	20.txt	0.331
97	142.txt	7.txt	0.331
98	148.txt	30.txt	0.327
99	120.txt	20.txt	0.324
100	150.txt	10.txt	0.323
101	159.txt	14.txt	0.314
102	116.txt	6.txt	0.310
103	124.txt	4.txt	0.308
104	140.txt	8.txt	0.307
105	134.txt	10.txt	0.300
106	118.txt	10.txt	0.299
107	132.txt	19.txt	0.297
108	116.txt	18.txt	0.297
109	135.txt	26.txt	0.296
110	136.txt	17.txt	0.292
111	155.txt	21.txt	0.291
112	116.txt	2.txt	0.290
113	116.txt	5.txt	0.288
114	141.txt	10.txt	0.286
115	155.txt	10.txt	0.283
116	149.txt	21.txt	0.281
117	135.txt	15.txt	0.279
118	146.txt	17.txt	0.278
119	138.txt	26.txt	0.277
120	132.txt	24.txt	0.274
121	149.txt	8.txt	0.272
122	138.txt	10.txt	0.270
123	116.txt	1.txt	0.269
124	125.txt	26.txt	0.269
125	125.txt	28.txt	0.269
126	150.txt	8.txt	0.268
127	119.txt	27.txt	0.268
128	128.txt	22.txt	0.266
129	139.txt	15.txt	0.265

130	135.txt	16.txt	0.264
131	135.txt	22.txt	0.262
132	116.txt	4.txt	0.261
133	117.txt	26.txt	0.260
134	140.txt	13.txt	0.260
135	116.txt	3.txt	0.259
136	156.txt	28.txt	0.258
137	123.txt	6.txt	0.254
138	143.txt	26.txt	0.252
139	115.txt	22.txt	0.252
140	140.txt	21.txt	0.251
141	119.txt	13.txt	0.251
142	159.txt	26.txt	0.249
143	143.txt	22.txt	0.248
144	148.txt	14.txt	0.247
145	146.txt	2.txt	0.247
146	119.txt	11.txt	0.244
147	157.txt	12.txt	0.242
148	134.txt	27.txt	0.242
149	154.txt	20.txt	0.240
150	115.txt	24.txt	0.238
151	128.txt	27.txt	0.237
152	140.txt	12.txt	0.237
153	118.txt	23.txt	0.237
154	133.txt	10.txt	0.235
155	141.txt	8.txt	0.235
156	146.txt	27.txt	0.235
157	143.txt	27.txt	0.234
158	125.txt	27.txt	0.233
159	132.txt	18.txt	0.233
160	118.txt	9.txt	0.232
161	118.txt	27.txt	0.232
162	159.txt	30.txt	0.230
163	119.txt	12.txt	0.230
164	121.txt	24.txt	0.229
165	133.txt	6.txt	0.229
166	140.txt	11.txt	0.228
167	138.txt	30.txt	0.228
168	143.txt	28.txt	0.227
169	117.txt	30.txt	0.227
170	150.txt	21.txt	0.226
171	125.txt	11.txt	0.224
172	149.txt	17.txt	0.224
173	118.txt	17.txt	0.223
174	151.txt	5.txt	0.223
175	148.txt	26.txt	0.221
176	124.txt	27.txt	0.220
177	153.txt	27.txt	0.219
178	133.txt	26.txt	0.217
179	122.txt	12.txt	0.217
180	124.txt	21.txt	0.215
181	136.txt	18.txt	0.214
182	154.txt	18.txt	0.214
183	146.txt	18.txt	0.214
184	122.txt	11.txt	0.214
185	149.txt	23.txt	0.214
186	122.txt	9.txt	0.213
187	149.txt	10.txt	0.211
188	149.txt	9.txt	0.211
189	122.txt	17.txt	0.210
190	127.txt	9.txt	0.210
191	151.txt	23.txt	0.208
192	149.txt	18.txt	0.207
193	134.txt	9.txt	0.207
194	118.txt	8.txt	0.207
195	146.txt	23.txt	0.206

196	146.txt	1.txt	0.206
197	147.txt	6.txt	0.205
198	118.txt	18.txt	0.203
199	143.txt	21.txt	0.203
200	141.txt	6.txt	0.202
201	136.txt	9.txt	0.202
202	132.txt	7.txt	0.202
203	136.txt	4.txt	0.202
204	117.txt	14.txt	0.201
205	136.txt	5.txt	0.201
206	129.txt	22.txt	0.200

Appendix B. TF-IDF English CctoTC

Rank	Source	Target	Similarity
1	152.txt	51.txt	0.660
2	152.txt	55.txt	0.608
3	152.txt	54.txt	0.605
4	152.txt	56.txt	0.603
5	152.txt	52.txt	0.599
6	152.txt	53.txt	0.583
7	114.txt	107.txt	0.566
8	114.txt	109.txt	0.552
9	114.txt	110.txt	0.540
10	114.txt	108.txt	0.535
11	114.txt	111.txt	0.530
12	144.txt	107.txt	0.498
13	137.txt	58.txt	0.493
14	152.txt	57.txt	0.493
15	144.txt	58.txt	0.486
16	144.txt	110.txt	0.478
17	151.txt	68.txt	0.476
18	144.txt	111.txt	0.470
19	114.txt	113.txt	0.461
20	117.txt	81.txt	0.458
21	144.txt	109.txt	0.456
22	151.txt	73.txt	0.449
23	151.txt	72.txt	0.449
24	144.txt	108.txt	0.442
25	117.txt	89.txt	0.435
26	114.txt	112.txt	0.434
27	144.txt	113.txt	0.432
28	159.txt	81.txt	0.431
29	151.txt	75.txt	0.428
30	137.txt	110.txt	0.425
31	134.txt	89.txt	0.422
32	137.txt	60.txt	0.419
33	134.txt	81.txt	0.419
34	137.txt	111.txt	0.418
35	137.txt	107.txt	0.415
36	134.txt	92.txt	0.415
37	117.txt	88.txt	0.410
38	144.txt	60.txt	0.408
39	134.txt	95.txt	0.408
40	151.txt	74.txt	0.407
41	134.txt	82.txt	0.406
42	137.txt	109.txt	0.406
43	151.txt	69.txt	0.405
44	155.txt	92.txt	0.405
45	159.txt	92.txt	0.402
46	151.txt	77.txt	0.401
47	151.txt	70.txt	0.399
48	117.txt	92.txt	0.398
49	159.txt	89.txt	0.398
50	155.txt	82.txt	0.396
51	151.txt	76.txt	0.396

52	137.txt	108.txt	0.393	118	142.txt	54.txt	0.319
53	159.txt	82.txt	0.393	119	129.txt	92.txt	0.317
54	117.txt	82.txt	0.389	120	130.txt	92.txt	0.316
55	151.txt	67.txt	0.387	121	134.txt	94.txt	0.316
56	144.txt	61.txt	0.387	122	142.txt	52.txt	0.315
57	134.txt	84.txt	0.384	123	138.txt	96.txt	0.315
58	144.txt	112.txt	0.383	124	117.txt	94.txt	0.314
59	159.txt	95.txt	0.381	125	148.txt	88.txt	0.314
60	137.txt	61.txt	0.377	126	155.txt	100.txt	0.312
61	117.txt	85.txt	0.376	127	159.txt	100.txt	0.312
62	117.txt	86.txt	0.374	128	129.txt	82.txt	0.310
63	155.txt	84.txt	0.373	129	130.txt	82.txt	0.309
64	137.txt	59.txt	0.373	130	134.txt	100.txt	0.308
65	148.txt	81.txt	0.373	131	142.txt	53.txt	0.307
66	134.txt	88.txt	0.371	132	117.txt	96.txt	0.306
67	142.txt	51.txt	0.371	133	120.txt	56.txt	0.306
68	159.txt	85.txt	0.371	134	133.txt	94.txt	0.304
69	159.txt	84.txt	0.370	135	126.txt	92.txt	0.304
70	159.txt	86.txt	0.369	136	150.txt	84.txt	0.304
71	117.txt	84.txt	0.366	137	132.txt	65.txt	0.304
72	159.txt	94.txt	0.365	138	138.txt	97.txt	0.303
73	151.txt	78.txt	0.364	139	117.txt	87.txt	0.303
74	144.txt	59.txt	0.364	140	148.txt	84.txt	0.303
75	117.txt	90.txt	0.363	141	119.txt	94.txt	0.303
76	159.txt	88.txt	0.363	142	148.txt	85.txt	0.302
77	159.txt	96.txt	0.363	143	159.txt	99.txt	0.301
78	129.txt	81.txt	0.363	144	148.txt	86.txt	0.300
79	137.txt	112.txt	0.361	145	129.txt	83.txt	0.298
80	117.txt	83.txt	0.361	146	130.txt	83.txt	0.298
81	137.txt	113.txt	0.361	147	126.txt	82.txt	0.298
82	159.txt	90.txt	0.359	148	125.txt	92.txt	0.298
83	140.txt	92.txt	0.358	149	135.txt	96.txt	0.297
84	159.txt	83.txt	0.356	150	140.txt	97.txt	0.297
85	134.txt	83.txt	0.356	151	133.txt	89.txt	0.295
86	140.txt	82.txt	0.350	152	140.txt	89.txt	0.295
87	130.txt	89.txt	0.350	153	134.txt	99.txt	0.294
88	134.txt	85.txt	0.349	154	138.txt	81.txt	0.293
89	129.txt	89.txt	0.349	155	148.txt	90.txt	0.292
90	114.txt	58.txt	0.348	156	159.txt	87.txt	0.291
91	155.txt	81.txt	0.348	157	125.txt	82.txt	0.291
92	134.txt	86.txt	0.347	158	148.txt	83.txt	0.290
93	155.txt	91.txt	0.347	159	129.txt	84.txt	0.289
94	134.txt	96.txt	0.346	160	130.txt	84.txt	0.289
95	130.txt	88.txt	0.346	161	120.txt	55.txt	0.288
96	129.txt	88.txt	0.345	162	159.txt	97.txt	0.288
97	159.txt	91.txt	0.344	163	120.txt	54.txt	0.287
98	151.txt	79.txt	0.344	164	130.txt	85.txt	0.286
99	148.txt	89.txt	0.344	165	130.txt	86.txt	0.285
100	138.txt	94.txt	0.340	166	135.txt	89.txt	0.284
101	151.txt	66.txt	0.340	167	125.txt	89.txt	0.284
102	117.txt	91.txt	0.339	168	117.txt	93.txt	0.284
103	142.txt	56.txt	0.339	169	126.txt	81.txt	0.284
104	130.txt	81.txt	0.339	170	120.txt	52.txt	0.284
105	134.txt	90.txt	0.339	171	133.txt	92.txt	0.283
106	134.txt	91.txt	0.338	172	129.txt	85.txt	0.282
107	151.txt	71.txt	0.336	173	135.txt	88.txt	0.282
108	120.txt	51.txt	0.336	174	159.txt	93.txt	0.282
109	140.txt	84.txt	0.330	175	150.txt	91.txt	0.282
110	150.txt	92.txt	0.330	176	133.txt	96.txt	0.282
111	148.txt	92.txt	0.328	177	148.txt	91.txt	0.281
112	128.txt	81.txt	0.328	178	129.txt	86.txt	0.281
113	125.txt	81.txt	0.326	179	134.txt	97.txt	0.280
114	150.txt	82.txt	0.323	180	134.txt	87.txt	0.280
115	148.txt	82.txt	0.321	181	155.txt	85.txt	0.279
116	142.txt	55.txt	0.320	182	150.txt	81.txt	0.278
117	155.txt	89.txt	0.319	183	138.txt	89.txt	0.278

184	155.txt	86.txt	0.278	250	135.txt	95.txt	0.241
185	142.txt	57.txt	0.277	251	129.txt	91.txt	0.241
186	128.txt	89.txt	0.277	252	132.txt	58.txt	0.240
187	133.txt	82.txt	0.277	253	155.txt	103.txt	0.240
188	120.txt	53.txt	0.277	254	124.txt	65.txt	0.239
189	119.txt	92.txt	0.276	255	155.txt	99.txt	0.239
190	126.txt	84.txt	0.275	256	128.txt	83.txt	0.239
191	130.txt	90.txt	0.274	257	132.txt	66.txt	0.239
192	128.txt	88.txt	0.274	258	134.txt	98.txt	0.237
193	143.txt	58.txt	0.274	259	129.txt	94.txt	0.237
194	138.txt	92.txt	0.273	260	135.txt	84.txt	0.236
195	159.txt	103.txt	0.272	261	159.txt	105.txt	0.236
196	119.txt	82.txt	0.271	262	128.txt	90.txt	0.236
197	125.txt	84.txt	0.270	263	148.txt	87.txt	0.236
198	155.txt	90.txt	0.270	264	119.txt	91.txt	0.235
199	129.txt	90.txt	0.270	265	138.txt	83.txt	0.235
200	134.txt	93.txt	0.269	266	126.txt	89.txt	0.234
201	155.txt	83.txt	0.269	267	138.txt	90.txt	0.234
202	133.txt	88.txt	0.268	268	114.txt	61.txt	0.233
203	138.txt	82.txt	0.268	269	138.txt	100.txt	0.233
204	135.txt	81.txt	0.267	270	128.txt	84.txt	0.232
205	140.txt	91.txt	0.267	271	159.txt	104.txt	0.232
206	151.txt	80.txt	0.267	272	156.txt	94.txt	0.231
207	133.txt	81.txt	0.266	273	151.txt	62.txt	0.230
208	155.txt	97.txt	0.265	274	114.txt	59.txt	0.230
209	140.txt	81.txt	0.265	275	138.txt	91.txt	0.230
210	132.txt	62.txt	0.263	276	135.txt	85.txt	0.227
211	130.txt	94.txt	0.261	277	150.txt	100.txt	0.227
212	153.txt	94.txt	0.261	278	134.txt	103.txt	0.226
213	130.txt	87.txt	0.261	279	135.txt	86.txt	0.226
214	159.txt	98.txt	0.261	280	159.txt	106.txt	0.225
215	133.txt	84.txt	0.261	281	133.txt	95.txt	0.224
216	129.txt	87.txt	0.260	282	125.txt	85.txt	0.224
217	135.txt	92.txt	0.260	283	125.txt	86.txt	0.223
218	140.txt	100.txt	0.258	284	150.txt	85.txt	0.222
219	130.txt	96.txt	0.258	285	150.txt	86.txt	0.221
220	114.txt	60.txt	0.258	286	148.txt	104.txt	0.221
221	159.txt	102.txt	0.258	287	133.txt	104.txt	0.221
222	128.txt	92.txt	0.257	288	119.txt	81.txt	0.221
223	155.txt	93.txt	0.256	289	125.txt	91.txt	0.220
224	148.txt	94.txt	0.255	290	133.txt	85.txt	0.220
225	135.txt	82.txt	0.255	291	158.txt	73.txt	0.219
226	119.txt	84.txt	0.254	292	133.txt	86.txt	0.219
227	132.txt	67.txt	0.253	293	119.txt	100.txt	0.219
228	150.txt	89.txt	0.252	294	119.txt	103.txt	0.218
229	128.txt	82.txt	0.251	295	117.txt	103.txt	0.218
230	119.txt	89.txt	0.251	296	135.txt	90.txt	0.216
231	126.txt	91.txt	0.251	297	148.txt	102.txt	0.216
232	148.txt	96.txt	0.250	298	140.txt	103.txt	0.215
233	138.txt	84.txt	0.250	299	118.txt	92.txt	0.214
234	138.txt	95.txt	0.250	300	150.txt	90.txt	0.214
235	120.txt	57.txt	0.250	301	150.txt	83.txt	0.214
236	140.txt	83.txt	0.249	302	148.txt	103.txt	0.214
237	128.txt	85.txt	0.249	303	140.txt	85.txt	0.214
238	138.txt	88.txt	0.248	304	148.txt	101.txt	0.214
239	133.txt	83.txt	0.248	305	133.txt	90.txt	0.213
240	128.txt	86.txt	0.248	306	140.txt	86.txt	0.213
241	129.txt	96.txt	0.245	307	135.txt	87.txt	0.212
242	159.txt	101.txt	0.245	308	125.txt	90.txt	0.212
243	125.txt	83.txt	0.245	309	126.txt	85.txt	0.212
244	130.txt	91.txt	0.245	310	157.txt	93.txt	0.212
245	135.txt	83.txt	0.244	311	148.txt	93.txt	0.212
246	138.txt	85.txt	0.244	312	126.txt	86.txt	0.211
247	138.txt	86.txt	0.243	313	134.txt	102.txt	0.211
248	155.txt	94.txt	0.242	314	128.txt	91.txt	0.210
249	125.txt	88.txt	0.241	315	128.txt	96.txt	0.210

316	118.txt	82.txt	0.210	33	121.asc	19.asc	0.422
317	147.txt	100.txt	0.209	34	127.asc	28.asc	0.420
318	132.txt	61.txt	0.209	35	122.asc	5.asc	0.419
319	135.txt	94.txt	0.209	36	120.asc	7.asc	0.417
320	133.txt	91.txt	0.209	37	126.asc	27.asc	0.415
321	117.txt	95.txt	0.208	38	155.asc	8.asc	0.410
322	117.txt	102.txt	0.207	39	147.asc	2.asc	0.407
323	133.txt	100.txt	0.207	40	122.asc	4.asc	0.400
324	127.txt	81.txt	0.207	41	151.asc	4.asc	0.397
325	150.txt	103.txt	0.207	42	146.asc	6.asc	0.394
326	128.txt	87.txt	0.207	43	151.asc	17.asc	0.389
327	140.txt	90.txt	0.206	44	153.asc	4.asc	0.388
328	134.txt	101.txt	0.205	45	147.asc	3.asc	0.384
329	155.txt	102.txt	0.205	46	148.asc	29.asc	0.380
330	120.txt	62.txt	0.205	47	119.asc	8.asc	0.377
331	117.txt	104.txt	0.204	48	146.asc	5.asc	0.369
332	133.txt	103.txt	0.204	49	144.asc	20.asc	0.369
333	126.txt	83.txt	0.204	50	151.asc	5.asc	0.367
334	133.txt	101.txt	0.203	51	156.asc	8.asc	0.366
335	155.txt	95.txt	0.203	52	115.asc	24.asc	0.365
336	155.txt	101.txt	0.203	53	134.asc	15.asc	0.363
337	128.txt	94.txt	0.203	54	148.asc	15.asc	0.356
338	138.txt	99.txt	0.202	55	151.asc	18.asc	0.353
339	133.txt	102.txt	0.202	56	132.asc	25.asc	0.347
340	140.txt	99.txt	0.202	57	155.asc	9.asc	0.346
341	134.txt	105.txt	0.202	58	155.asc	21.asc	0.345
342	127.txt	92.txt	0.201	59	127.asc	27.asc	0.343
343	133.txt	105.txt	0.201	60	117.asc	22.asc	0.343
344	142.txt	62.txt	0.201	61	125.asc	27.asc	0.332
345	141.txt	97.txt	0.200	62	134.asc	16.asc	0.329
				63	148.asc	16.asc	0.328
				64	159.asc	15.asc	0.327
				65	140.asc	10.asc	0.327
				66	133.asc	16.asc	0.321
				67	141.asc	8.asc	0.320
				68	114.asc	20.asc	0.319
				69	159.asc	16.asc	0.318
				70	147.asc	1.asc	0.317
				71	137.asc	25.asc	0.313
				72	142.asc	7.asc	0.311
				73	138.asc	22.asc	0.309
				74	148.asc	14.asc	0.301
				75	116.asc	23.asc	0.297
				76	146.asc	4.asc	0.295
				77	119.asc	21.asc	0.293
				78	115.asc	19.asc	0.289
				79	128.asc	26.asc	0.287
				80	140.asc	9.asc	0.286
				81	120.asc	20.asc	0.284
				82	140.asc	8.asc	0.283
				83	121.asc	24.asc	0.276
				84	134.asc	14.asc	0.272
				85	115.asc	21.asc	0.270
				86	122.asc	17.asc	0.268
				87	120.asc	25.asc	0.266
				88	132.asc	19.asc	0.265
				89	117.asc	30.asc	0.263
				90	157.asc	11.asc	0.260
				91	125.asc	28.asc	0.259
				92	123.asc	3.asc	0.259
				93	122.asc	11.asc	0.256
				94	157.asc	12.asc	0.255
				95	138.asc	16.asc	0.251
				96	150.asc	26.asc	0.250
				97	140.asc	21.asc	0.248
				98	140.asc	27.asc	0.248

Appendix C. TF-IDF Italian CCtoUC

Rank	Source	Target	Similarity
1	156.asc	11.asc	0.617
2	156.asc	12.asc	0.609
3	129.asc	30.asc	0.599
4	158.asc	2.asc	0.564
5	119.asc	9.asc	0.563
6	156.asc	9.asc	0.548
7	153.asc	6.asc	0.530
8	130.asc	29.asc	0.520
9	114.asc	25.asc	0.519
10	156.asc	13.asc	0.515
11	141.asc	12.asc	0.514
12	141.asc	9.asc	0.509
13	122.asc	2.asc	0.496
14	122.asc	6.asc	0.494
15	144.asc	25.asc	0.483
16	141.asc	13.asc	0.483
17	149.asc	21.asc	0.469
18	141.asc	11.asc	0.458
19	153.asc	5.asc	0.458
20	158.asc	1.asc	0.456
21	122.asc	3.asc	0.454
22	122.asc	1.asc	0.449
23	151.asc	23.asc	0.439
24	152.asc	7.asc	0.439
25	158.asc	3.asc	0.438
26	118.asc	21.asc	0.438
27	132.asc	20.asc	0.436
28	119.asc	13.asc	0.429
29	150.asc	27.asc	0.427
30	119.asc	12.asc	0.426
31	133.asc	15.asc	0.426
32	119.asc	11.asc	0.423

99	138.asc	30.asc	0.248	31	151.asc	78.asc	0.389
100	139.asc	22.asc	0.247	32	159.asc	84.asc	0.386
101	122.asc	12.asc	0.243	33	151.asc	70.asc	0.385
102	141.asc	28.asc	0.243	34	159.asc	90.asc	0.383
103	122.asc	9.asc	0.241	35	159.asc	81.asc	0.380
104	128.asc	27.asc	0.238	36	151.asc	77.asc	0.378
105	136.asc	17.asc	0.235	37	134.asc	84.asc	0.378
106	154.asc	18.asc	0.234	38	159.asc	85.asc	0.377
107	123.asc	2.asc	0.234	39	151.asc	76.asc	0.376
108	155.asc	10.asc	0.232	40	151.asc	66.asc	0.374
109	119.asc	10.asc	0.231	41	137.asc	108.asc	0.372
110	137.asc	20.asc	0.230	42	151.asc	79.asc	0.371
111	133.asc	14.asc	0.227	43	132.asc	62.asc	0.369
112	114.asc	7.asc	0.225	44	137.asc	109.asc	0.368
113	126.asc	28.asc	0.221	45	144.asc	112.asc	0.365
114	115.asc	22.asc	0.218	46	151.asc	71.asc	0.362
115	135.asc	15.asc	0.217	47	144.asc	113.asc	0.360
116	134.asc	18.asc	0.213	48	148.asc	81.asc	0.358
117	115.asc	25.asc	0.213	49	159.asc	83.asc	0.357
118	157.asc	9.asc	0.212	50	138.asc	81.asc	0.357
119	157.asc	28.asc	0.212	51	137.asc	107.asc	0.355
120	121.asc	25.asc	0.212	52	144.asc	58.asc	0.355
121	122.asc	8.asc	0.210	53	137.asc	58.asc	0.349
122	150.asc	10.asc	0.207	54	159.asc	89.asc	0.348
123	134.asc	10.asc	0.206	55	134.asc	85.asc	0.347
124	125.asc	26.asc	0.205	56	134.asc	81.asc	0.346
125	128.asc	22.asc	0.205	57	159.asc	91.asc	0.343
126	138.asc	27.asc	0.203	58	134.asc	82.asc	0.341
127	123.asc	6.asc	0.202	59	148.asc	92.asc	0.341
128	135.asc	16.asc	0.202	60	144.asc	61.asc	0.336
129	148.asc	30.asc	0.202	61	155.asc	92.asc	0.334
130	138.asc	26.asc	0.200	62	134.asc	86.asc	0.334
				63	134.asc	102.asc	0.334
				64	159.asc	82.asc	0.330
				65	137.asc	112.asc	0.330
				66	137.asc	61.asc	0.329
				67	134.asc	83.asc	0.329
				68	137.asc	110.asc	0.328
				69	132.asc	65.asc	0.327
				70	134.asc	90.asc	0.327
				71	137.asc	113.asc	0.325
				72	137.asc	111.asc	0.325
				73	148.asc	84.asc	0.325
				74	142.asc	56.asc	0.325
				75	133.asc	102.asc	0.321
				76	155.asc	84.asc	0.318
				77	137.asc	59.asc	0.318
				78	144.asc	59.asc	0.314
				79	121.asc	62.asc	0.314
				80	134.asc	94.asc	0.313
				81	137.asc	60.asc	0.312
				82	134.asc	91.asc	0.311
				83	148.asc	85.asc	0.309
				84	144.asc	60.asc	0.308
				85	148.asc	82.asc	0.306
				86	134.asc	89.asc	0.303
				87	134.asc	97.asc	0.303
				88	148.asc	89.asc	0.303
				89	159.asc	88.asc	0.302
				90	159.asc	93.asc	0.302
				91	142.asc	54.asc	0.298
				92	142.asc	52.asc	0.297
				93	155.asc	81.asc	0.297
				94	133.asc	103.asc	0.296
				95	142.asc	55.asc	0.295
				96	142.asc	53.asc	0.295

Appendix D. TF-IDF Italian CCtoTC

Rank	Source	Target	Similarity
1	152.asc	51.asc	0.607
2	152.asc	54.asc	0.538
3	152.asc	52.asc	0.537
4	152.asc	55.asc	0.534
5	152.asc	53.asc	0.533
6	152.asc	56.asc	0.518
7	151.asc	72.asc	0.474
8	114.asc	107.asc	0.464
9	151.asc	75.asc	0.461
10	152.asc	57.asc	0.451
11	114.asc	108.asc	0.437
12	144.asc	107.asc	0.434
13	114.asc	110.asc	0.433
14	114.asc	109.asc	0.433
15	114.asc	111.asc	0.429
16	151.asc	74.asc	0.423
17	151.asc	68.asc	0.413
18	151.asc	73.asc	0.409
19	159.asc	92.asc	0.405
20	151.asc	69.asc	0.405
21	142.asc	51.asc	0.402
22	144.asc	108.asc	0.401
23	114.asc	112.asc	0.398
24	144.asc	109.asc	0.397
25	134.asc	92.asc	0.396
26	144.asc	110.asc	0.396
27	144.asc	111.asc	0.393
28	159.asc	86.asc	0.392
29	114.asc	113.asc	0.392
30	151.asc	67.asc	0.391

97	148.asc	94.asc	0.295	163	140.asc	91.asc	0.238
98	159.asc	95.asc	0.294	164	140.asc	102.asc	0.238
99	148.asc	83.asc	0.292	165	155.asc	94.asc	0.238
100	134.asc	103.asc	0.292	166	155.asc	90.asc	0.237
101	140.asc	92.asc	0.290	167	159.asc	98.asc	0.236
102	148.asc	95.asc	0.289	168	140.asc	101.asc	0.236
103	159.asc	96.asc	0.289	169	130.asc	95.asc	0.235
104	120.asc	51.asc	0.287	170	159.asc	102.asc	0.235
105	159.asc	87.asc	0.286	171	135.asc	84.asc	0.234
106	121.asc	58.asc	0.286	172	155.asc	85.asc	0.234
107	148.asc	101.asc	0.285	173	141.asc	105.asc	0.234
108	140.asc	81.asc	0.283	174	134.asc	88.asc	0.233
109	132.asc	58.asc	0.283	175	120.asc	56.asc	0.233
110	159.asc	97.asc	0.282	176	133.asc	86.asc	0.233
111	142.asc	57.asc	0.282	177	130.asc	96.asc	0.232
112	155.asc	91.asc	0.282	178	159.asc	103.asc	0.232
113	133.asc	105.asc	0.280	179	148.asc	100.asc	0.230
114	148.asc	86.asc	0.280	180	140.asc	82.asc	0.230
115	133.asc	101.asc	0.279	181	141.asc	101.asc	0.229
116	148.asc	102.asc	0.279	182	140.asc	100.asc	0.229
117	148.asc	103.asc	0.278	183	114.asc	59.asc	0.228
118	129.asc	81.asc	0.276	184	133.asc	90.asc	0.227
119	140.asc	84.asc	0.276	185	158.asc	74.asc	0.227
120	148.asc	90.asc	0.273	186	135.asc	83.asc	0.227
121	155.asc	82.asc	0.272	187	140.asc	105.asc	0.225
122	148.asc	97.asc	0.270	188	134.asc	98.asc	0.224
123	134.asc	100.asc	0.270	189	155.asc	97.asc	0.224
124	134.asc	95.asc	0.267	190	133.asc	85.asc	0.224
125	155.asc	89.asc	0.267	191	148.asc	99.asc	0.224
126	159.asc	100.asc	0.267	192	140.asc	97.asc	0.223
127	134.asc	105.asc	0.266	193	114.asc	60.asc	0.223
128	159.asc	99.asc	0.266	194	117.asc	81.asc	0.223
129	158.asc	73.asc	0.264	195	130.asc	81.asc	0.223
130	132.asc	61.asc	0.262	196	159.asc	105.asc	0.222
131	140.asc	103.asc	0.261	197	155.asc	83.asc	0.222
132	134.asc	101.asc	0.259	198	134.asc	87.asc	0.220
133	150.asc	81.asc	0.259	199	130.asc	94.asc	0.220
134	133.asc	104.asc	0.257	200	135.asc	97.asc	0.219
135	155.asc	100.asc	0.257	201	146.asc	66.asc	0.218
136	158.asc	67.asc	0.256	202	140.asc	86.asc	0.218
137	148.asc	96.asc	0.255	203	148.asc	93.asc	0.218
138	148.asc	88.asc	0.255	204	128.asc	81.asc	0.218
139	151.asc	80.asc	0.255	205	148.asc	104.asc	0.218
140	134.asc	99.asc	0.255	206	155.asc	93.asc	0.217
141	125.asc	81.asc	0.255	207	139.asc	94.asc	0.216
142	133.asc	92.asc	0.254	208	130.asc	89.asc	0.215
143	133.asc	81.asc	0.253	209	135.asc	81.asc	0.215
144	158.asc	75.asc	0.252	210	133.asc	89.asc	0.215
145	114.asc	58.asc	0.251	211	140.asc	90.asc	0.213
146	135.asc	92.asc	0.249	212	150.asc	103.asc	0.213
147	148.asc	91.asc	0.249	213	133.asc	83.asc	0.212
148	135.asc	86.asc	0.249	214	140.asc	85.asc	0.210
149	158.asc	72.asc	0.249	215	135.asc	89.asc	0.208
150	138.asc	94.asc	0.248	216	133.asc	97.asc	0.208
151	141.asc	102.asc	0.247	217	133.asc	106.asc	0.207
152	148.asc	105.asc	0.246	218	133.asc	91.asc	0.207
153	158.asc	68.asc	0.244	219	158.asc	66.asc	0.205
154	117.asc	94.asc	0.244	220	155.asc	99.asc	0.205
155	134.asc	96.asc	0.244	221	155.asc	102.asc	0.205
156	155.asc	86.asc	0.244	222	120.asc	54.asc	0.205
157	133.asc	84.asc	0.242	223	120.asc	52.asc	0.204
158	114.asc	61.asc	0.242	224	140.asc	89.asc	0.204
159	135.asc	90.asc	0.239	225	135.asc	91.asc	0.204
160	141.asc	103.asc	0.239	226	158.asc	77.asc	0.203
161	135.asc	85.asc	0.239	227	120.asc	55.asc	0.203
162	134.asc	93.asc	0.238	228	158.asc	78.asc	0.203

229	155.asc	103.asc	0.203
230	120.asc	53.asc	0.203
231	119.asc	92.asc	0.202
232	120.asc	57.asc	0.202
233	158.asc	76.asc	0.202
234	138.asc	89.asc	0.202
235	135.asc	82.asc	0.202
236	135.asc	95.asc	0.201
237	133.asc	94.asc	0.201
238	150.asc	101.asc	0.201
239	132.asc	63.asc	0.201
240	135.asc	96.asc	0.200

49	120.txt	7.txt	0.755
50	142.txt	7.txt	0.749
51	140.txt	8.txt	0.749
52	157.txt	11.txt	0.743
53	123.txt	3.txt	0.737
54	123.txt	1.txt	0.735
55	133.txt	23.txt	0.729
56	159.txt	16.txt	0.724
57	158.txt	1.txt	0.718
58	124.txt	5.txt	0.716
59	153.txt	4.txt	0.712
60	122.txt	3.txt	0.708
61	141.txt	12.txt	0.702
62	143.txt	22.txt	0.698
63	146.txt	4.txt	0.695
64	122.txt	6.txt	0.694
65	142.txt	25.txt	0.694
66	125.txt	26.txt	0.693
67	121.txt	24.txt	0.692
68	148.txt	29.txt	0.689
69	136.txt	17.txt	0.687
70	156.txt	12.txt	0.678
71	125.txt	28.txt	0.675
72	148.txt	15.txt	0.671
73	154.txt	20.txt	0.666
74	120.txt	20.txt	0.655
75	141.txt	11.txt	0.652
76	124.txt	4.txt	0.650
77	136.txt	18.txt	0.650
78	150.txt	9.txt	0.646
79	121.txt	19.txt	0.640
80	151.txt	4.txt	0.635
81	143.txt	23.txt	0.629
82	150.txt	8.txt	0.629
83	159.txt	14.txt	0.623
84	151.txt	17.txt	0.623
85	122.txt	5.txt	0.621
86	122.txt	2.txt	0.604
87	149.txt	27.txt	0.601
88	143.txt	21.txt	0.595
89	154.txt	17.txt	0.594
90	140.txt	10.txt	0.568
91	148.txt	16.txt	0.541
92	148.txt	14.txt	0.537
93	125.txt	27.txt	0.514
94	145.txt	23.txt	0.511
95	122.txt	4.txt	0.503
96	122.txt	1.txt	0.503
97	159.txt	22.txt	0.497
98	121.txt	25.txt	0.494
99	121.txt	20.txt	0.494
100	154.txt	25.txt	0.465
101	156.txt	13.txt	0.462
102	145.txt	1.txt	0.460
103	151.txt	18.txt	0.454
104	140.txt	21.txt	0.435
105	115.txt	22.txt	0.430
106	155.txt	10.txt	0.429
107	150.txt	28.txt	0.429
108	122.txt	17.txt	0.420
109	151.txt	6.txt	0.403
110	154.txt	23.txt	0.401
111	151.txt	1.txt	0.400
112	146.txt	2.txt	0.397
113	146.txt	3.txt	0.395
114	146.txt	1.txt	0.388

Appendix E. TF-IDF Feedback Top2 English CCToUC

Rank	Source	Target	Similarity
1	127.txt	28.txt	0.974
2	129.txt	30.txt	0.968
3	138.txt	22.txt	0.960
4	118.txt	21.txt	0.958
5	130.txt	29.txt	0.954
6	115.txt	21.txt	0.946
7	116.txt	23.txt	0.944
8	135.txt	26.txt	0.943
9	117.txt	22.txt	0.939
10	139.txt	22.txt	0.921
11	128.txt	26.txt	0.906
12	145.txt	17.txt	0.892
13	155.txt	9.txt	0.878
14	147.txt	2.txt	0.857
15	119.txt	10.txt	0.851
16	146.txt	6.txt	0.845
17	126.txt	27.txt	0.840
18	149.txt	21.txt	0.834
19	152.txt	7.txt	0.830
20	132.txt	20.txt	0.829
21	158.txt	2.txt	0.825
22	158.txt	3.txt	0.820
23	114.txt	20.txt	0.819
24	156.txt	11.txt	0.809
25	153.txt	6.txt	0.807
26	123.txt	2.txt	0.806
27	147.txt	3.txt	0.806
28	137.txt	25.txt	0.806
29	132.txt	25.txt	0.804
30	140.txt	9.txt	0.804
31	133.txt	22.txt	0.804
32	124.txt	6.txt	0.802
33	155.txt	8.txt	0.795
34	114.txt	25.txt	0.794
35	142.txt	20.txt	0.790
36	144.txt	20.txt	0.790
37	153.txt	5.txt	0.788
38	157.txt	12.txt	0.784
39	144.txt	25.txt	0.783
40	141.txt	13.txt	0.775
41	150.txt	27.txt	0.774
42	154.txt	18.txt	0.772
43	146.txt	5.txt	0.769
44	137.txt	20.txt	0.769
45	147.txt	1.txt	0.767
46	151.txt	5.txt	0.765
47	159.txt	15.txt	0.761
48	120.txt	25.txt	0.759

115	155.txt	27.txt	0.387	181	153.txt	9.txt	0.287
116	123.txt	4.txt	0.387	182	155.txt	28.txt	0.286
117	136.txt	23.txt	0.386	183	141.txt	3.txt	0.286
118	147.txt	4.txt	0.382	184	158.txt	18.txt	0.286
119	153.txt	1.txt	0.381	185	123.txt	10.txt	0.286
120	124.txt	18.txt	0.379	186	118.txt	26.txt	0.285
121	153.txt	3.txt	0.378	187	119.txt	11.txt	0.284
122	146.txt	13.txt	0.378	188	151.txt	9.txt	0.284
123	153.txt	10.txt	0.374	189	150.txt	30.txt	0.283
124	150.txt	11.txt	0.372	190	146.txt	9.txt	0.283
125	122.txt	13.txt	0.371	191	138.txt	15.txt	0.280
126	124.txt	3.txt	0.370	192	159.txt	18.txt	0.280
127	124.txt	2.txt	0.369	193	133.txt	5.txt	0.280
128	141.txt	6.txt	0.363	194	136.txt	14.txt	0.280
129	124.txt	1.txt	0.360	195	146.txt	12.txt	0.277
130	154.txt	14.txt	0.360	196	136.txt	20.txt	0.276
131	155.txt	13.txt	0.358	197	148.txt	9.txt	0.276
132	122.txt	10.txt	0.357	198	125.txt	21.txt	0.275
133	150.txt	10.txt	0.357	199	159.txt	30.txt	0.275
134	140.txt	27.txt	0.356	200	149.txt	30.txt	0.275
135	118.txt	23.txt	0.355	201	157.txt	4.txt	0.274
136	136.txt	2.txt	0.354	202	148.txt	22.txt	0.274
137	119.txt	27.txt	0.351	203	116.txt	1.txt	0.274
138	147.txt	18.txt	0.348	204	154.txt	9.txt	0.273
139	123.txt	18.txt	0.346	205	149.txt	28.txt	0.273
140	115.txt	30.txt	0.345	206	145.txt	9.txt	0.273
141	153.txt	13.txt	0.344	207	148.txt	30.txt	0.272
142	154.txt	2.txt	0.338	208	156.txt	10.txt	0.271
143	154.txt	1.txt	0.334	209	143.txt	4.txt	0.271
144	154.txt	7.txt	0.327	210	122.txt	11.txt	0.271
145	122.txt	18.txt	0.326	211	155.txt	5.txt	0.270
146	115.txt	23.txt	0.322	212	145.txt	20.txt	0.270
147	116.txt	21.txt	0.320	213	157.txt	17.txt	0.269
148	157.txt	10.txt	0.319	214	140.txt	18.txt	0.269
149	151.txt	12.txt	0.318	215	125.txt	12.txt	0.268
150	118.txt	28.txt	0.317	216	124.txt	11.txt	0.268
151	159.txt	26.txt	0.316	217	140.txt	6.txt	0.267
152	145.txt	6.txt	0.315	218	141.txt	15.txt	0.267
153	139.txt	26.txt	0.314	219	147.txt	12.txt	0.267
154	118.txt	30.txt	0.314	220	140.txt	15.txt	0.266
155	123.txt	12.txt	0.314	221	143.txt	5.txt	0.265
156	115.txt	28.txt	0.313	222	158.txt	12.txt	0.265
157	158.txt	4.txt	0.313	223	159.txt	13.txt	0.265
158	122.txt	12.txt	0.311	224	153.txt	11.txt	0.265
159	140.txt	14.txt	0.309	225	159.txt	17.txt	0.264
160	115.txt	26.txt	0.307	226	155.txt	15.txt	0.263
161	159.txt	10.txt	0.307	227	146.txt	11.txt	0.262
162	133.txt	4.txt	0.307	228	133.txt	26.txt	0.262
163	124.txt	12.txt	0.306	229	124.txt	23.txt	0.261
164	122.txt	23.txt	0.304	230	149.txt	10.txt	0.261
165	157.txt	5.txt	0.303	231	123.txt	11.txt	0.261
166	148.txt	26.txt	0.303	232	127.txt	12.txt	0.260
167	124.txt	9.txt	0.300	233	119.txt	3.txt	0.259
168	119.txt	12.txt	0.300	234	120.txt	4.txt	0.259
169	123.txt	13.txt	0.297	235	151.txt	14.txt	0.258
170	157.txt	2.txt	0.296	236	140.txt	28.txt	0.258
171	122.txt	9.txt	0.296	237	150.txt	13.txt	0.257
172	123.txt	9.txt	0.296	238	126.txt	9.txt	0.257
173	153.txt	12.txt	0.295	239	147.txt	9.txt	0.256
174	153.txt	23.txt	0.294	240	148.txt	18.txt	0.254
175	146.txt	23.txt	0.292	241	133.txt	30.txt	0.252
176	145.txt	12.txt	0.291	242	118.txt	12.txt	0.250
177	156.txt	28.txt	0.291	243	143.txt	8.txt	0.249
178	145.txt	3.txt	0.290	244	116.txt	2.txt	0.249
179	155.txt	14.txt	0.289	245	125.txt	11.txt	0.248
180	117.txt	15.txt	0.288	246	151.txt	15.txt	0.248

247	127.txt	8.txt	0.248	313	145.txt	11.txt	0.225
248	145.txt	15.txt	0.247	314	142.txt	14.txt	0.225
249	139.txt	15.txt	0.247	315	140.txt	3.txt	0.225
250	155.txt	6.txt	0.247	316	155.txt	17.txt	0.225
251	158.txt	13.txt	0.247	317	154.txt	8.txt	0.224
252	140.txt	5.txt	0.246	318	120.txt	17.txt	0.224
253	157.txt	27.txt	0.246	319	141.txt	2.txt	0.224
254	157.txt	28.txt	0.245	320	155.txt	18.txt	0.224
255	140.txt	2.txt	0.244	321	120.txt	8.txt	0.224
256	153.txt	27.txt	0.243	322	135.txt	14.txt	0.223
257	143.txt	27.txt	0.242	323	140.txt	1.txt	0.223
258	154.txt	15.txt	0.242	324	156.txt	4.txt	0.223
259	154.txt	24.txt	0.242	325	143.txt	26.txt	0.222
260	159.txt	23.txt	0.242	326	148.txt	27.txt	0.222
261	143.txt	9.txt	0.242	327	121.txt	16.txt	0.222
262	157.txt	1.txt	0.242	328	125.txt	14.txt	0.220
263	147.txt	11.txt	0.242	329	155.txt	4.txt	0.220
264	141.txt	21.txt	0.241	330	143.txt	28.txt	0.220
265	158.txt	10.txt	0.241	331	149.txt	6.txt	0.220
266	157.txt	14.txt	0.240	332	139.txt	14.txt	0.220
267	115.txt	12.txt	0.240	333	156.txt	27.txt	0.220
268	153.txt	8.txt	0.240	334	136.txt	6.txt	0.219
269	141.txt	5.txt	0.239	335	157.txt	18.txt	0.219
270	154.txt	6.txt	0.239	336	115.txt	10.txt	0.219
271	151.txt	3.txt	0.238	337	123.txt	14.txt	0.219
272	138.txt	14.txt	0.238	338	158.txt	23.txt	0.218
273	119.txt	14.txt	0.238	339	125.txt	13.txt	0.218
274	140.txt	17.txt	0.237	340	133.txt	1.txt	0.217
275	141.txt	14.txt	0.237	341	147.txt	10.txt	0.217
276	148.txt	10.txt	0.237	342	141.txt	16.txt	0.217
277	155.txt	2.txt	0.237	343	159.txt	7.txt	0.216
278	158.txt	11.txt	0.237	344	143.txt	12.txt	0.216
279	150.txt	14.txt	0.237	345	136.txt	25.txt	0.215
280	122.txt	8.txt	0.236	346	118.txt	11.txt	0.215
281	146.txt	8.txt	0.236	347	145.txt	25.txt	0.214
282	149.txt	12.txt	0.236	348	150.txt	6.txt	0.213
283	151.txt	11.txt	0.236	349	120.txt	12.txt	0.212
284	159.txt	11.txt	0.235	350	140.txt	16.txt	0.211
285	159.txt	5.txt	0.235	351	142.txt	4.txt	0.211
286	140.txt	4.txt	0.235	352	116.txt	28.txt	0.211
287	157.txt	21.txt	0.235	353	150.txt	18.txt	0.210
288	135.txt	21.txt	0.234	354	148.txt	2.txt	0.210
289	146.txt	27.txt	0.234	355	116.txt	26.txt	0.210
290	149.txt	23.txt	0.233	356	129.txt	14.txt	0.210
291	142.txt	17.txt	0.233	357	116.txt	30.txt	0.210
292	149.txt	11.txt	0.232	358	154.txt	3.txt	0.209
293	117.txt	14.txt	0.232	359	138.txt	28.txt	0.209
294	159.txt	8.txt	0.232	360	142.txt	11.txt	0.209
295	154.txt	16.txt	0.232	361	114.txt	4.txt	0.208
296	123.txt	15.txt	0.231	362	141.txt	17.txt	0.208
297	158.txt	9.txt	0.230	363	148.txt	17.txt	0.208
298	116.txt	20.txt	0.230	364	159.txt	20.txt	0.208
299	122.txt	27.txt	0.230	365	157.txt	6.txt	0.208
300	141.txt	4.txt	0.230	366	148.txt	13.txt	0.208
301	120.txt	14.txt	0.230	367	148.txt	11.txt	0.207
302	157.txt	16.txt	0.230	368	142.txt	23.txt	0.207
303	124.txt	8.txt	0.229	369	139.txt	28.txt	0.207
304	159.txt	2.txt	0.229	370	150.txt	4.txt	0.207
305	154.txt	12.txt	0.228	371	136.txt	12.txt	0.207
306	147.txt	23.txt	0.228	372	157.txt	3.txt	0.206
307	154.txt	11.txt	0.228	373	145.txt	16.txt	0.206
308	141.txt	27.txt	0.228	374	151.txt	8.txt	0.206
309	124.txt	27.txt	0.228	375	132.txt	4.txt	0.205
310	141.txt	28.txt	0.227	376	126.txt	11.txt	0.205
311	147.txt	13.txt	0.227	377	120.txt	9.txt	0.205
312	116.txt	24.txt	0.226	378	136.txt	11.txt	0.205

379	141.txt	18.txt	0.205	45	137.txt	111.txt	0.597
380	132.txt	19.txt	0.204	46	134.txt	99.txt	0.595
381	115.txt	11.txt	0.204	47	149.txt	73.txt	0.594
382	141.txt	1.txt	0.204	48	159.txt	83.txt	0.592
383	127.txt	11.txt	0.204	49	144.txt	107.txt	0.588
384	156.txt	15.txt	0.204	50	144.txt	112.txt	0.587
385	123.txt	23.txt	0.203	51	116.txt	69.txt	0.586
386	147.txt	14.txt	0.203	52	116.txt	68.txt	0.585
387	132.txt	11.txt	0.202	53	139.txt	99.txt	0.585
388	127.txt	22.txt	0.201	54	136.txt	78.txt	0.585
389	153.txt	14.txt	0.201	55	120.txt	53.txt	0.585
390	156.txt	1.txt	0.201	56	114.txt	112.txt	0.585
391	114.txt	11.txt	0.201	57	154.txt	68.txt	0.584
392	157.txt	7.txt	0.201	58	144.txt	58.txt	0.584
393	132.txt	14.txt	0.201	59	137.txt	110.txt	0.583
394	127.txt	13.txt	0.200	60	133.txt	97.txt	0.582
				61	138.txt	98.txt	0.581
				62	148.txt	90.txt	0.579
				63	154.txt	69.txt	0.579
				64	138.txt	94.txt	0.579
				65	133.txt	95.txt	0.579
				66	134.txt	98.txt	0.578
				67	159.txt	90.txt	0.578
				68	117.txt	83.txt	0.578
				69	121.txt	65.txt	0.578
				70	137.txt	113.txt	0.576
				71	120.txt	52.txt	0.575
				72	134.txt	95.txt	0.574
				73	139.txt	98.txt	0.574
				74	120.txt	55.txt	0.573
				75	159.txt	85.txt	0.573
				76	148.txt	83.txt	0.573
				77	117.txt	85.txt	0.572
				78	120.txt	54.txt	0.572
				79	116.txt	67.txt	0.572
				80	137.txt	58.txt	0.570
				81	132.txt	113.txt	0.570
				82	120.txt	51.txt	0.566
				83	116.txt	75.txt	0.565
				84	116.txt	72.txt	0.564
				85	144.txt	111.txt	0.564
				86	145.txt	75.txt	0.564
				87	145.txt	72.txt	0.562
				88	159.txt	92.txt	0.560
				89	144.txt	113.txt	0.560
				90	114.txt	113.txt	0.560
				91	139.txt	92.txt	0.560
				92	145.txt	67.txt	0.560
				93	139.txt	95.txt	0.559
				94	159.txt	88.txt	0.558
				95	154.txt	67.txt	0.557
				96	116.txt	74.txt	0.557
				97	120.txt	56.txt	0.557
				98	115.txt	77.txt	0.554
				99	145.txt	74.txt	0.553
				100	148.txt	86.txt	0.551
				101	144.txt	110.txt	0.550
				102	139.txt	90.txt	0.550
				103	133.txt	94.txt	0.550
				104	148.txt	85.txt	0.550
				105	115.txt	68.txt	0.549
				106	117.txt	88.txt	0.549
				107	134.txt	104.txt	0.547
				108	159.txt	86.txt	0.547
				109	132.txt	107.txt	0.547
				110	154.txt	72.txt	0.547

Appendix F. TF-IDF Feedback Top2 English CctoC

Rank	Source	Target	Similarity
1	136.txt	66.txt	0.795
2	145.txt	80.txt	0.768
3	149.txt	66.txt	0.744
4	136.txt	67.txt	0.744
5	142.txt	113.txt	0.742
6	136.txt	75.txt	0.740
7	136.txt	72.txt	0.739
8	136.txt	74.txt	0.734
9	149.txt	69.txt	0.732
10	149.txt	68.txt	0.724
11	149.txt	67.txt	0.713
12	136.txt	68.txt	0.712
13	149.txt	75.txt	0.707
14	149.txt	72.txt	0.707
15	149.txt	74.txt	0.697
16	136.txt	69.txt	0.695
17	116.txt	80.txt	0.690
18	149.txt	70.txt	0.683
19	149.txt	76.txt	0.680
20	152.txt	57.txt	0.677
21	154.txt	80.txt	0.675
22	152.txt	53.txt	0.669
23	152.txt	51.txt	0.669
24	152.txt	54.txt	0.668
25	152.txt	55.txt	0.668
26	152.txt	52.txt	0.665
27	152.txt	56.txt	0.646
28	121.txt	61.txt	0.635
29	120.txt	57.txt	0.634
30	134.txt	96.txt	0.629
31	138.txt	96.txt	0.628
32	149.txt	77.txt	0.627
33	136.txt	70.txt	0.624
34	138.txt	97.txt	0.623
35	116.txt	66.txt	0.621
36	139.txt	97.txt	0.619
37	136.txt	76.txt	0.617
38	137.txt	107.txt	0.614
39	136.txt	77.txt	0.614
40	136.txt	73.txt	0.613
41	137.txt	112.txt	0.613
42	138.txt	95.txt	0.610
43	138.txt	99.txt	0.604
44	134.txt	97.txt	0.603

111	121.txt	62.txt	0.547	177	117.txt	81.txt	0.482
112	137.txt	108.txt	0.546	178	159.txt	102.txt	0.480
113	137.txt	109.txt	0.545	179	114.txt	109.txt	0.477
114	139.txt	102.txt	0.544	180	154.txt	66.txt	0.476
115	116.txt	70.txt	0.544	181	145.txt	66.txt	0.476
116	116.txt	76.txt	0.544	182	114.txt	111.txt	0.476
117	148.txt	87.txt	0.543	183	115.txt	75.txt	0.475
118	132.txt	109.txt	0.541	184	117.txt	92.txt	0.475
119	114.txt	107.txt	0.541	185	116.txt	73.txt	0.475
120	117.txt	90.txt	0.541	186	154.txt	70.txt	0.473
121	136.txt	79.txt	0.540	187	139.txt	101.txt	0.473
122	148.txt	88.txt	0.539	188	134.txt	105.txt	0.470
123	117.txt	89.txt	0.539	189	145.txt	70.txt	0.468
124	132.txt	108.txt	0.539	190	114.txt	110.txt	0.468
125	149.txt	78.txt	0.539	191	114.txt	108.txt	0.467
126	134.txt	101.txt	0.538	192	115.txt	63.txt	0.466
127	138.txt	102.txt	0.538	193	115.txt	69.txt	0.465
128	154.txt	62.txt	0.538	194	115.txt	74.txt	0.464
129	145.txt	68.txt	0.535	195	138.txt	105.txt	0.463
130	159.txt	81.txt	0.535	196	139.txt	105.txt	0.462
131	138.txt	101.txt	0.534	197	115.txt	66.txt	0.459
132	159.txt	89.txt	0.533	198	154.txt	73.txt	0.454
133	145.txt	69.txt	0.531	199	145.txt	76.txt	0.454
134	154.txt	75.txt	0.529	200	136.txt	71.txt	0.452
135	115.txt	67.txt	0.529	201	145.txt	77.txt	0.452
136	121.txt	58.txt	0.526	202	145.txt	73.txt	0.448
137	133.txt	92.txt	0.525	203	159.txt	104.txt	0.444
138	134.txt	102.txt	0.525	204	115.txt	73.txt	0.440
139	138.txt	100.txt	0.523	205	115.txt	70.txt	0.439
140	144.txt	108.txt	0.520	206	144.txt	60.txt	0.439
141	115.txt	76.txt	0.520	207	116.txt	78.txt	0.437
142	144.txt	109.txt	0.520	208	159.txt	101.txt	0.435
143	133.txt	85.txt	0.519	209	144.txt	59.txt	0.434
144	134.txt	100.txt	0.517	210	148.txt	101.txt	0.434
145	115.txt	65.txt	0.517	211	137.txt	60.txt	0.433
146	148.txt	89.txt	0.517	212	139.txt	85.txt	0.433
147	139.txt	96.txt	0.516	213	133.txt	96.txt	0.431
148	154.txt	74.txt	0.513	214	132.txt	111.txt	0.430
149	139.txt	100.txt	0.509	215	137.txt	59.txt	0.429
150	133.txt	99.txt	0.509	216	133.txt	90.txt	0.427
151	117.txt	86.txt	0.506	217	149.txt	71.txt	0.427
152	133.txt	98.txt	0.505	218	134.txt	106.txt	0.427
153	134.txt	89.txt	0.505	219	134.txt	90.txt	0.427
154	133.txt	88.txt	0.505	220	134.txt	87.txt	0.426
155	142.txt	108.txt	0.501	221	138.txt	106.txt	0.425
156	142.txt	109.txt	0.500	222	148.txt	103.txt	0.424
157	116.txt	77.txt	0.500	223	148.txt	105.txt	0.423
158	117.txt	87.txt	0.497	224	145.txt	78.txt	0.423
159	115.txt	62.txt	0.497	225	115.txt	78.txt	0.421
160	139.txt	104.txt	0.496	226	139.txt	87.txt	0.421
161	138.txt	104.txt	0.496	227	159.txt	103.txt	0.421
162	148.txt	81.txt	0.495	228	139.txt	86.txt	0.420
163	115.txt	72.txt	0.495	229	139.txt	106.txt	0.417
164	159.txt	87.txt	0.493	230	132.txt	112.txt	0.416
165	133.txt	89.txt	0.491	231	148.txt	98.txt	0.408
166	149.txt	79.txt	0.490	232	139.txt	94.txt	0.407
167	138.txt	103.txt	0.489	233	159.txt	105.txt	0.407
168	115.txt	64.txt	0.489	234	159.txt	97.txt	0.407
169	132.txt	110.txt	0.489	235	159.txt	95.txt	0.405
170	148.txt	102.txt	0.486	236	139.txt	91.txt	0.404
171	154.txt	76.txt	0.485	237	154.txt	78.txt	0.402
172	139.txt	103.txt	0.484	238	159.txt	98.txt	0.399
173	133.txt	81.txt	0.484	239	133.txt	104.txt	0.399
174	148.txt	104.txt	0.483	240	116.txt	79.txt	0.398
175	154.txt	77.txt	0.482	241	142.txt	107.txt	0.397
176	134.txt	103.txt	0.482	242	134.txt	86.txt	0.395

243	133.txt	87.txt	0.393	309	154.txt	65.txt	0.319
244	133.txt	86.txt	0.393	310	148.txt	100.txt	0.316
245	148.txt	97.txt	0.393	311	159.txt	100.txt	0.316
246	133.txt	102.txt	0.392	312	117.txt	94.txt	0.315
247	159.txt	84.txt	0.392	313	149.txt	62.txt	0.315
248	134.txt	88.txt	0.391	314	139.txt	81.txt	0.314
249	145.txt	79.txt	0.390	315	115.txt	80.txt	0.312
250	115.txt	79.txt	0.387	316	159.txt	93.txt	0.309
251	133.txt	83.txt	0.386	317	138.txt	89.txt	0.304
252	139.txt	84.txt	0.386	318	142.txt	110.txt	0.303
253	133.txt	100.txt	0.384	319	142.txt	112.txt	0.303
254	134.txt	91.txt	0.383	320	149.txt	80.txt	0.302
255	159.txt	91.txt	0.381	321	134.txt	81.txt	0.301
256	148.txt	92.txt	0.380	322	148.txt	93.txt	0.298
257	138.txt	87.txt	0.380	323	148.txt	94.txt	0.297
258	134.txt	94.txt	0.379	324	144.txt	61.txt	0.293
259	139.txt	83.txt	0.378	325	142.txt	111.txt	0.293
260	134.txt	85.txt	0.374	326	138.txt	82.txt	0.290
261	134.txt	84.txt	0.373	327	138.txt	81.txt	0.289
262	134.txt	83.txt	0.373	328	117.txt	103.txt	0.288
263	138.txt	90.txt	0.371	329	138.txt	93.txt	0.287
264	138.txt	85.txt	0.370	330	117.txt	96.txt	0.281
265	148.txt	84.txt	0.370	331	116.txt	62.txt	0.278
266	133.txt	101.txt	0.370	332	134.txt	82.txt	0.278
267	154.txt	79.txt	0.369	333	116.txt	65.txt	0.273
268	148.txt	91.txt	0.368	334	137.txt	61.txt	0.270
269	133.txt	84.txt	0.367	335	117.txt	99.txt	0.268
270	159.txt	82.txt	0.365	336	117.txt	93.txt	0.267
271	148.txt	95.txt	0.361	337	117.txt	105.txt	0.262
272	148.txt	99.txt	0.360	338	144.txt	62.txt	0.259
273	159.txt	99.txt	0.357	339	133.txt	93.txt	0.257
274	117.txt	84.txt	0.355	340	133.txt	106.txt	0.257
275	117.txt	82.txt	0.355	341	137.txt	62.txt	0.235
276	148.txt	106.txt	0.355	342	145.txt	65.txt	0.232
277	138.txt	86.txt	0.353	343	117.txt	100.txt	0.232
278	134.txt	92.txt	0.353	344	144.txt	64.txt	0.212
279	116.txt	71.txt	0.352	345	149.txt	65.txt	0.209
280	138.txt	84.txt	0.352	346	154.txt	58.txt	0.209
281	117.txt	95.txt	0.352	347	137.txt	64.txt	0.208
282	133.txt	91.txt	0.352	348	117.txt	106.txt	0.207
283	117.txt	91.txt	0.349	349	144.txt	65.txt	0.206
284	139.txt	89.txt	0.349				
285	139.txt	88.txt	0.347				
286	159.txt	94.txt	0.346				
287	138.txt	83.txt	0.346				
288	117.txt	97.txt	0.343				
289	134.txt	93.txt	0.342				
290	133.txt	103.txt	0.341				
291	159.txt	106.txt	0.341				
292	159.txt	96.txt	0.340				
293	145.txt	71.txt	0.338				
294	139.txt	93.txt	0.338				
295	133.txt	105.txt	0.338				
296	154.txt	71.txt	0.337				
297	117.txt	101.txt	0.333				
298	148.txt	96.txt	0.332				
299	117.txt	102.txt	0.330				
300	138.txt	92.txt	0.327				
301	138.txt	91.txt	0.325				
302	133.txt	82.txt	0.324				
303	136.txt	80.txt	0.322				
304	117.txt	98.txt	0.322				
305	139.txt	82.txt	0.321				
306	115.txt	71.txt	0.320				
307	148.txt	82.txt	0.320				
308	138.txt	88.txt	0.320				

Appendix G. TF-IDF Feedback Top2 Italian CCToUC

Rank	Source	Target	Similarity
1	129.asc	30.asc	0.956
2	133.asc	10.asc	0.932
3	151.asc	4.asc	0.911
4	136.asc	17.asc	0.911
5	138.asc	22.asc	0.903
6	139.asc	22.asc	0.872
7	116.asc	23.asc	0.871
8	131.asc	27.asc	0.870
9	142.asc	7.asc	0.860
10	130.asc	29.asc	0.859
11	155.asc	9.asc	0.842
12	117.asc	22.asc	0.841
13	151.asc	5.asc	0.840
14	156.asc	11.asc	0.836
15	118.asc	21.asc	0.836
16	115.asc	24.asc	0.831
17	127.asc	28.asc	0.830
18	158.asc	2.asc	0.829
19	155.asc	8.asc	0.828

20	152.asc	7.asc	0.826	86	124.asc	5.asc	0.615
21	145.asc	23.asc	0.818	87	122.asc	17.asc	0.613
22	158.asc	1.asc	0.817	88	145.asc	17.asc	0.605
23	126.asc	27.asc	0.811	89	150.asc	10.asc	0.600
24	128.asc	26.asc	0.810	90	148.asc	16.asc	0.596
25	150.asc	27.asc	0.809	91	125.asc	26.asc	0.595
26	140.asc	9.asc	0.808	92	131.asc	28.asc	0.589
27	144.asc	20.asc	0.805	93	149.asc	23.asc	0.585
28	147.asc	2.asc	0.804	94	124.asc	6.asc	0.581
29	156.asc	12.asc	0.801	95	143.asc	26.asc	0.559
30	132.asc	20.asc	0.797	96	148.asc	14.asc	0.553
31	159.asc	16.asc	0.794	97	151.asc	2.asc	0.552
32	154.asc	18.asc	0.789	98	159.asc	14.asc	0.549
33	151.asc	17.asc	0.787	99	121.asc	25.asc	0.537
34	149.asc	21.asc	0.786	100	121.asc	20.asc	0.530
35	153.asc	6.asc	0.770	101	124.asc	4.asc	0.516
36	153.asc	5.asc	0.770	102	136.asc	18.asc	0.494
37	144.asc	25.asc	0.763	103	151.asc	6.asc	0.485
38	147.asc	1.asc	0.763	104	115.asc	20.asc	0.470
39	122.asc	2.asc	0.762	105	147.asc	4.asc	0.451
40	147.asc	3.asc	0.762	106	122.asc	18.asc	0.427
41	146.asc	5.asc	0.762	107	145.asc	18.asc	0.415
42	141.asc	12.asc	0.762	108	146.asc	1.asc	0.411
43	159.asc	15.asc	0.761	109	123.asc	4.asc	0.392
44	122.asc	6.asc	0.759	110	158.asc	6.asc	0.389
45	114.asc	25.asc	0.753	111	146.asc	18.asc	0.387
46	120.asc	20.asc	0.752	112	136.asc	6.asc	0.381
47	122.asc	5.asc	0.750	113	155.asc	10.asc	0.377
48	141.asc	13.asc	0.744	114	140.asc	21.asc	0.368
49	140.asc	8.asc	0.741	115	147.asc	18.asc	0.367
50	146.asc	6.asc	0.735	116	153.asc	1.asc	0.353
51	125.asc	27.asc	0.733	117	145.asc	2.asc	0.342
52	134.asc	14.asc	0.730	118	124.asc	1.asc	0.340
53	120.asc	7.asc	0.729	119	136.asc	3.asc	0.340
54	158.asc	3.asc	0.726	120	153.asc	18.asc	0.340
55	122.asc	3.asc	0.720	121	136.asc	23.asc	0.339
56	132.asc	25.asc	0.720	122	154.asc	15.asc	0.331
57	156.asc	13.asc	0.716	123	158.asc	18.asc	0.329
58	114.asc	20.asc	0.716	124	123.asc	18.asc	0.327
59	135.asc	26.asc	0.715	125	154.asc	20.asc	0.327
60	121.asc	19.asc	0.703	126	124.asc	18.asc	0.327
61	137.asc	20.asc	0.701	127	136.asc	20.asc	0.320
62	137.asc	25.asc	0.692	128	122.asc	12.asc	0.320
63	143.asc	28.asc	0.689	129	151.asc	3.asc	0.319
64	154.asc	17.asc	0.687	130	145.asc	1.asc	0.312
65	148.asc	29.asc	0.679	131	122.asc	13.asc	0.311
66	131.asc	26.asc	0.679	132	150.asc	9.asc	0.308
67	141.asc	11.asc	0.678	133	122.asc	10.asc	0.298
68	157.asc	11.asc	0.676	134	122.asc	9.asc	0.295
69	148.asc	15.asc	0.673	135	136.asc	15.asc	0.293
70	153.asc	4.asc	0.669	136	151.asc	11.asc	0.289
71	146.asc	4.asc	0.667	137	154.asc	14.asc	0.288
72	123.asc	2.asc	0.663	138	150.asc	6.asc	0.284
73	115.asc	25.asc	0.650	139	146.asc	10.asc	0.284
74	140.asc	10.asc	0.648	140	155.asc	5.asc	0.281
75	123.asc	3.asc	0.647	141	151.asc	8.asc	0.280
76	121.asc	24.asc	0.643	142	146.asc	13.asc	0.279
77	125.asc	28.asc	0.639	143	154.asc	23.asc	0.278
78	157.asc	12.asc	0.630	144	147.asc	12.asc	0.274
79	142.asc	25.asc	0.629	145	122.asc	11.asc	0.274
80	122.asc	4.asc	0.629	146	154.asc	6.asc	0.270
81	122.asc	1.asc	0.627	147	133.asc	3.asc	0.269
82	142.asc	20.asc	0.625	148	150.asc	21.asc	0.269
83	120.asc	25.asc	0.624	149	151.asc	12.asc	0.268
84	151.asc	18.asc	0.619	150	147.asc	9.asc	0.263
85	123.asc	1.asc	0.617	151	133.asc	6.asc	0.263

152	115.asc	21.asc	0.262	218	155.asc	6.asc	0.226
153	151.asc	9.asc	0.260	219	136.asc	9.asc	0.226
154	153.asc	10.asc	0.259	220	148.asc	5.asc	0.225
155	150.asc	8.asc	0.258	221	115.asc	22.asc	0.225
156	141.asc	2.asc	0.258	222	123.asc	15.asc	0.225
157	157.asc	28.asc	0.257	223	148.asc	26.asc	0.224
158	123.asc	12.asc	0.257	224	140.asc	18.asc	0.224
159	154.asc	16.asc	0.256	225	147.asc	13.asc	0.224
160	146.asc	9.asc	0.256	226	148.asc	12.asc	0.223
161	133.asc	8.asc	0.255	227	153.asc	8.asc	0.223
162	153.asc	9.asc	0.254	228	147.asc	8.asc	0.222
163	122.asc	15.asc	0.253	229	149.asc	5.asc	0.222
164	155.asc	14.asc	0.252	230	156.asc	15.asc	0.221
165	153.asc	13.asc	0.252	231	133.asc	21.asc	0.221
166	147.asc	11.asc	0.251	232	141.asc	17.asc	0.220
167	146.asc	23.asc	0.251	233	136.asc	16.asc	0.220
168	124.asc	13.asc	0.250	234	146.asc	8.asc	0.220
169	140.asc	5.asc	0.249	235	133.asc	14.asc	0.219
170	158.asc	12.asc	0.249	236	145.asc	6.asc	0.219
171	154.asc	8.asc	0.248	237	148.asc	17.asc	0.219
172	151.asc	15.asc	0.248	238	142.asc	14.asc	0.219
173	122.asc	8.asc	0.247	239	140.asc	15.asc	0.218
174	136.asc	12.asc	0.247	240	155.asc	4.asc	0.217
175	146.asc	12.asc	0.246	241	150.asc	30.asc	0.216
176	154.asc	25.asc	0.246	242	157.asc	15.asc	0.216
177	124.asc	10.asc	0.245	243	156.asc	6.asc	0.216
178	155.asc	15.asc	0.245	244	121.asc	22.asc	0.215
179	141.asc	3.asc	0.245	245	156.asc	1.asc	0.215
180	141.asc	15.asc	0.245	246	136.asc	8.asc	0.214
181	140.asc	14.asc	0.244	247	148.asc	30.asc	0.214
182	154.asc	9.asc	0.244	248	153.asc	11.asc	0.214
183	156.asc	5.asc	0.243	249	140.asc	4.asc	0.214
184	135.asc	30.asc	0.242	250	136.asc	25.asc	0.213
185	149.asc	4.asc	0.242	251	132.asc	19.asc	0.213
186	123.asc	10.asc	0.241	252	142.asc	4.asc	0.213
187	151.asc	20.asc	0.241	253	154.asc	12.asc	0.212
188	141.asc	6.asc	0.240	254	156.asc	17.asc	0.212
189	147.asc	10.asc	0.240	255	133.asc	11.asc	0.211
190	156.asc	2.asc	0.240	256	136.asc	14.asc	0.210
191	154.asc	3.asc	0.240	257	148.asc	10.asc	0.210
192	157.asc	2.asc	0.238	258	145.asc	24.asc	0.210
193	153.asc	12.asc	0.237	259	151.asc	7.asc	0.210
194	141.asc	5.asc	0.237	260	157.asc	17.asc	0.210
195	158.asc	9.asc	0.237	261	148.asc	2.asc	0.210
196	141.asc	1.asc	0.237	262	140.asc	1.asc	0.210
197	116.asc	24.asc	0.237	263	122.asc	14.asc	0.209
198	123.asc	13.asc	0.236	264	158.asc	8.asc	0.209
199	154.asc	7.asc	0.234	265	146.asc	15.asc	0.209
200	123.asc	11.asc	0.232	266	158.asc	10.asc	0.209
201	158.asc	11.asc	0.232	267	124.asc	12.asc	0.208
202	140.asc	6.asc	0.232	268	155.asc	18.asc	0.208
203	131.asc	30.asc	0.232	269	141.asc	28.asc	0.208
204	123.asc	9.asc	0.231	270	156.asc	4.asc	0.207
205	157.asc	5.asc	0.231	271	158.asc	15.asc	0.206
206	119.asc	10.asc	0.230	272	155.asc	17.asc	0.206
207	134.asc	8.asc	0.230	273	150.asc	11.asc	0.206
208	147.asc	15.asc	0.229	274	124.asc	9.asc	0.206
209	154.asc	11.asc	0.229	275	134.asc	30.asc	0.205
210	140.asc	2.asc	0.228	276	151.asc	14.asc	0.205
211	155.asc	2.asc	0.228	277	157.asc	1.asc	0.205
212	116.asc	21.asc	0.228	278	150.asc	3.asc	0.204
213	122.asc	23.asc	0.227	279	142.asc	1.asc	0.204
214	142.asc	18.asc	0.227	280	153.asc	15.asc	0.203
215	142.asc	11.asc	0.227	281	141.asc	4.asc	0.203
216	146.asc	11.asc	0.227	282	120.asc	19.asc	0.202
217	136.asc	11.asc	0.227	283	149.asc	30.asc	0.202

284	140.asc	27.asc	0.202
285	153.asc	23.asc	0.201
286	140.asc	17.asc	0.200
287	138.asc	24.asc	0.200
288	125.asc	21.asc	0.200
289	124.asc	8.asc	0.200

Appendix H. TF-IDF Feedback Top2 Italian CCtoTC

Rank	Source	Target	Similarity
1	149.asc	66.asc	0.796
2	149.asc	73.asc	0.780
3	149.asc	67.asc	0.779
4	149.asc	74.asc	0.775
5	149.asc	68.asc	0.775
6	136.asc	66.asc	0.775
7	136.asc	69.asc	0.771
8	149.asc	75.asc	0.766
9	149.asc	72.asc	0.765
10	145.asc	80.asc	0.764
11	136.asc	67.asc	0.761
12	136.asc	73.asc	0.756
13	136.asc	68.asc	0.754
14	136.asc	74.asc	0.752
15	154.asc	80.asc	0.748
16	136.asc	75.asc	0.745
17	136.asc	72.asc	0.744
18	149.asc	77.asc	0.735
19	149.asc	69.asc	0.734
20	116.asc	80.asc	0.723
21	152.asc	51.asc	0.720
22	136.asc	76.asc	0.719
23	136.asc	77.asc	0.718
24	133.asc	101.asc	0.709
25	133.asc	106.asc	0.702
26	133.asc	102.asc	0.698
27	133.asc	103.asc	0.697
28	152.asc	54.asc	0.687
29	149.asc	76.asc	0.684
30	152.asc	55.asc	0.682
31	133.asc	99.asc	0.682
32	152.asc	52.asc	0.680
33	152.asc	53.asc	0.680
34	133.asc	105.asc	0.664
35	149.asc	70.asc	0.661
36	136.asc	70.asc	0.660
37	133.asc	104.asc	0.654
38	145.asc	66.asc	0.644
39	152.asc	57.asc	0.642
40	120.asc	51.asc	0.634
41	152.asc	56.asc	0.631
42	133.asc	98.asc	0.631
43	133.asc	97.asc	0.631
44	139.asc	96.asc	0.630
45	138.asc	96.asc	0.628
46	139.asc	95.asc	0.627
47	159.asc	83.asc	0.627
48	114.asc	107.asc	0.627
49	114.asc	113.asc	0.625
50	116.asc	66.asc	0.623
51	145.asc	67.asc	0.623
52	137.asc	107.asc	0.621
53	138.asc	95.asc	0.617
54	145.asc	73.asc	0.617

55	145.asc	68.asc	0.616
56	145.asc	74.asc	0.615
57	133.asc	100.asc	0.614
58	120.asc	54.asc	0.614
59	120.asc	57.asc	0.613
60	120.asc	52.asc	0.608
61	120.asc	53.asc	0.608
62	145.asc	75.asc	0.607
63	134.asc	83.asc	0.607
64	120.asc	55.asc	0.606
65	137.asc	113.asc	0.606
66	159.asc	102.asc	0.606
67	145.asc	72.asc	0.606
68	159.asc	90.asc	0.605
69	139.asc	94.asc	0.603
70	159.asc	85.asc	0.598
71	116.asc	67.asc	0.598
72	114.asc	112.asc	0.595
73	137.asc	109.asc	0.595
74	159.asc	86.asc	0.594
75	154.asc	67.asc	0.593
76	137.asc	112.asc	0.593
77	134.asc	90.asc	0.593
78	138.asc	94.asc	0.591
79	149.asc	78.asc	0.591
80	144.asc	58.asc	0.591
81	116.asc	68.asc	0.590
82	137.asc	108.asc	0.590
83	154.asc	66.asc	0.590
84	144.asc	107.asc	0.589
85	116.asc	74.asc	0.588
86	159.asc	84.asc	0.587
87	154.asc	74.asc	0.586
88	136.asc	78.asc	0.586
89	145.asc	69.asc	0.586
90	134.asc	84.asc	0.585
91	145.asc	77.asc	0.585
92	154.asc	68.asc	0.584
93	116.asc	73.asc	0.584
94	159.asc	103.asc	0.583
95	134.asc	86.asc	0.581
96	148.asc	83.asc	0.581
97	159.asc	92.asc	0.580
98	121.asc	62.asc	0.579
99	134.asc	85.asc	0.577
100	154.asc	75.asc	0.574
101	159.asc	87.asc	0.574
102	116.asc	75.asc	0.574
103	114.asc	109.asc	0.574
104	154.asc	72.asc	0.573
105	137.asc	111.asc	0.573
106	137.asc	58.asc	0.573
107	114.asc	108.asc	0.573
108	116.asc	72.asc	0.572
109	120.asc	56.asc	0.572
110	137.asc	110.asc	0.570
111	148.asc	88.asc	0.569
112	159.asc	97.asc	0.567
113	144.asc	113.asc	0.566
114	144.asc	112.asc	0.565
115	139.asc	97.asc	0.564
116	139.asc	99.asc	0.564
117	149.asc	79.asc	0.563
118	121.asc	65.asc	0.562
119	138.asc	97.asc	0.561
120	134.asc	92.asc	0.560

121	121.asc	58.asc	0.557	187	115.asc	75.asc	0.476
122	148.asc	90.asc	0.556	188	117.asc	89.asc	0.475
123	116.asc	69.asc	0.555	189	139.asc	92.asc	0.469
124	138.asc	99.asc	0.554	190	115.asc	74.asc	0.469
125	116.asc	77.asc	0.554	191	115.asc	73.asc	0.469
126	136.asc	79.asc	0.553	192	115.asc	76.asc	0.467
127	154.asc	69.asc	0.552	193	138.asc	100.asc	0.461
128	134.asc	91.asc	0.552	194	115.asc	69.asc	0.460
129	154.asc	73.asc	0.551	195	139.asc	100.asc	0.460
130	114.asc	111.asc	0.550	196	138.asc	88.asc	0.459
131	144.asc	109.asc	0.546	197	159.asc	95.asc	0.459
132	148.asc	89.asc	0.546	198	145.asc	79.asc	0.458
133	148.asc	84.asc	0.546	199	134.asc	105.asc	0.458
134	114.asc	110.asc	0.545	200	134.asc	99.asc	0.456
135	121.asc	61.asc	0.545	201	116.asc	78.asc	0.456
136	145.asc	76.asc	0.543	202	134.asc	97.asc	0.454
137	159.asc	98.asc	0.542	203	159.asc	106.asc	0.449
138	139.asc	98.asc	0.542	204	134.asc	101.asc	0.449
139	144.asc	108.asc	0.541	205	134.asc	104.asc	0.446
140	144.asc	111.asc	0.539	206	134.asc	98.asc	0.445
141	134.asc	82.asc	0.538	207	115.asc	70.asc	0.444
142	144.asc	110.asc	0.535	208	137.asc	60.asc	0.442
143	138.asc	98.asc	0.535	209	144.asc	60.asc	0.439
144	138.asc	81.asc	0.535	210	137.asc	59.asc	0.437
145	134.asc	102.asc	0.532	211	116.asc	79.asc	0.435
146	115.asc	61.asc	0.532	212	144.asc	59.asc	0.434
147	115.asc	77.asc	0.532	213	154.asc	78.asc	0.433
148	115.asc	58.asc	0.528	214	117.asc	86.asc	0.430
149	115.asc	66.asc	0.528	215	159.asc	96.asc	0.428
150	139.asc	81.asc	0.525	216	139.asc	90.asc	0.426
151	159.asc	101.asc	0.525	217	117.asc	92.asc	0.425
152	145.asc	70.asc	0.522	218	133.asc	90.asc	0.423
153	159.asc	105.asc	0.520	219	159.asc	100.asc	0.423
154	148.asc	81.asc	0.520	220	159.asc	82.asc	0.423
155	115.asc	65.asc	0.520	221	133.asc	94.asc	0.423
156	115.asc	67.asc	0.520	222	139.asc	87.asc	0.421
157	148.asc	92.asc	0.519	223	159.asc	91.asc	0.421
158	139.asc	85.asc	0.516	224	148.asc	85.asc	0.421
159	116.asc	76.asc	0.516	225	139.asc	86.asc	0.419
160	134.asc	87.asc	0.515	226	139.asc	89.asc	0.413
161	138.asc	89.asc	0.513	227	139.asc	84.asc	0.413
162	148.asc	82.asc	0.508	228	139.asc	102.asc	0.412
163	117.asc	88.asc	0.506	229	138.asc	92.asc	0.410
164	149.asc	71.asc	0.506	230	154.asc	79.asc	0.409
165	117.asc	83.asc	0.503	231	148.asc	104.asc	0.409
166	115.asc	68.asc	0.499	232	148.asc	91.asc	0.409
167	159.asc	99.asc	0.497	233	139.asc	88.asc	0.409
168	116.asc	70.asc	0.497	234	117.asc	85.asc	0.407
169	154.asc	77.asc	0.497	235	145.asc	71.asc	0.406
170	133.asc	95.asc	0.497	236	115.asc	78.asc	0.406
171	154.asc	76.asc	0.496	237	133.asc	86.asc	0.404
172	133.asc	96.asc	0.494	238	139.asc	101.asc	0.404
173	121.asc	64.asc	0.494	239	148.asc	98.asc	0.403
174	134.asc	103.asc	0.493	240	138.asc	101.asc	0.400
175	115.asc	72.asc	0.492	241	139.asc	83.asc	0.399
176	117.asc	87.asc	0.491	242	138.asc	84.asc	0.398
177	148.asc	87.asc	0.489	243	138.asc	90.asc	0.395
178	148.asc	86.asc	0.489	244	115.asc	79.asc	0.394
179	115.asc	62.asc	0.488	245	138.asc	102.asc	0.394
180	136.asc	71.asc	0.488	246	138.asc	85.asc	0.393
181	159.asc	104.asc	0.488	247	116.asc	71.asc	0.393
182	117.asc	81.asc	0.486	248	134.asc	95.asc	0.391
183	154.asc	70.asc	0.485	249	121.asc	63.asc	0.389
184	145.asc	78.asc	0.480	250	133.asc	87.asc	0.387
185	117.asc	90.asc	0.480	251	133.asc	91.asc	0.387
186	115.asc	64.asc	0.476	252	138.asc	87.asc	0.382

253	148.asc	102.asc	0.381	319	115.asc	112.asc	0.288
254	138.asc	86.asc	0.381	320	117.asc	103.asc	0.286
255	154.asc	71.asc	0.380	321	117.asc	82.asc	0.283
256	138.asc	83.asc	0.379	322	117.asc	96.asc	0.280
257	159.asc	88.asc	0.379	323	139.asc	106.asc	0.279
258	134.asc	106.asc	0.377	324	145.asc	65.asc	0.279
259	139.asc	104.asc	0.377	325	116.asc	65.asc	0.278
260	159.asc	89.asc	0.375	326	138.asc	106.asc	0.278
261	148.asc	97.asc	0.375	327	133.asc	82.asc	0.275
262	139.asc	103.asc	0.375	328	115.asc	107.asc	0.273
263	139.asc	91.asc	0.373	329	134.asc	94.asc	0.271
264	148.asc	101.asc	0.373	330	117.asc	99.asc	0.269
265	138.asc	104.asc	0.372	331	115.asc	63.asc	0.267
266	159.asc	93.asc	0.369	332	117.asc	93.asc	0.267
267	133.asc	84.asc	0.368	333	116.asc	62.asc	0.265
268	148.asc	95.asc	0.368	334	154.asc	65.asc	0.261
269	134.asc	88.asc	0.366	335	136.asc	65.asc	0.255
270	148.asc	99.asc	0.365	336	115.asc	60.asc	0.250
271	134.asc	89.asc	0.365	337	149.asc	65.asc	0.246
272	134.asc	96.asc	0.364	338	144.asc	64.asc	0.243
273	139.asc	82.asc	0.364	339	133.asc	81.asc	0.239
274	149.asc	80.asc	0.362	340	144.asc	51.asc	0.234
275	159.asc	81.asc	0.361	341	115.asc	59.asc	0.231
276	148.asc	103.asc	0.360	342	117.asc	100.asc	0.231
277	148.asc	105.asc	0.359	343	115.asc	109.asc	0.230
278	148.asc	96.asc	0.359	344	115.asc	113.asc	0.230
279	138.asc	91.asc	0.358	345	117.asc	106.asc	0.225
280	133.asc	92.asc	0.358	346	145.asc	62.asc	0.225
281	138.asc	103.asc	0.357	347	137.asc	51.asc	0.224
282	133.asc	83.asc	0.354	348	144.asc	65.asc	0.221
283	134.asc	100.asc	0.353	349	121.asc	60.asc	0.218
284	133.asc	85.asc	0.353	350	121.asc	59.asc	0.218
285	134.asc	93.asc	0.352	351	137.asc	64.asc	0.217
286	139.asc	105.asc	0.351	352	115.asc	108.asc	0.216
287	136.asc	80.asc	0.350	353	121.asc	76.asc	0.215
288	138.asc	105.asc	0.347	354	154.asc	62.asc	0.208
289	138.asc	82.asc	0.339	355	121.asc	67.asc	0.208
290	115.asc	71.asc	0.336	356	136.asc	64.asc	0.207
291	133.asc	93.asc	0.335	357	151.asc	66.asc	0.203
292	117.asc	84.asc	0.335	358	137.asc	65.asc	0.203
293	117.asc	98.asc	0.333	359	121.asc	66.asc	0.201
294	134.asc	81.asc	0.328				
295	137.asc	61.asc	0.328				
296	139.asc	93.asc	0.325				
297	144.asc	61.asc	0.324				
298	144.asc	62.asc	0.324				
299	117.asc	102.asc	0.320				
300	115.asc	111.asc	0.313				
301	159.asc	94.asc	0.311				
302	115.asc	80.asc	0.310				
303	117.asc	91.asc	0.309				
304	117.asc	101.asc	0.309				
305	148.asc	93.asc	0.308				
306	148.asc	94.asc	0.307				
307	136.asc	62.asc	0.305				
308	133.asc	89.asc	0.304				
309	149.asc	62.asc	0.299				
310	117.asc	95.asc	0.296				
311	117.asc	105.asc	0.296				
312	138.asc	93.asc	0.294				
313	148.asc	100.asc	0.293				
314	133.asc	88.asc	0.293				
315	137.asc	62.asc	0.292				
316	117.asc	97.asc	0.291				
317	148.asc	106.asc	0.289				
318	115.asc	110.asc	0.289				