

### Multimedia Appendix 3. Effects of additional features on FOCUS's ranking performance

Table A3-1. Performances of different FOCUS<sup>a</sup> systems implemented by using baseline features or by adding each type of additional feature(s) on the baseline features. We report the *P* values (if *P*<.1) between each implementation and FOCUS-base<sup>b</sup>.

System	P5 <sup>c</sup>	R5 <sup>d</sup>	F5 <sup>e</sup>	P10 <sup>f</sup>	R10 <sup>g</sup>	F10 <sup>h</sup>	AUC-ROC <sub>ranking</sub> <sup>i</sup>	AUC-ROC <sub>KE</sub> <sup>j</sup>
FOCUS-base	0.413	0.256	0.295	0.331	0.401	0.337	0.911	0.840
+ word embedding <sup>k</sup>	0.427	0.286	0.318	0.349	0.435 ( <i>P</i> =.05)	0.360 ( <i>P</i> =.06)	0.933 ( <i>P</i> <.001)	0.860 ( <i>P</i> <.001)
+ UMLS semantic type <sup>l</sup>	0.456 ( <i>P</i> =.03)	0.297 ( <i>P</i> =.003)	0.335 ( <i>P</i> =.005)	0.349 ( <i>P</i> =.099)	0.438 ( <i>P</i> =.01)	0.359 ( <i>P</i> =.04)	0.926 ( <i>P</i> <.001)	0.853 ( <i>P</i> <.001)
+ CHV <sup>m</sup>	0.433	0.271	0.310	0.338	0.409	0.343	0.919 ( <i>P</i> =.003)	0.847 ( <i>P</i> =.002)
+ topic <sup>n</sup>	0.418	0.261	0.300	0.349 ( <i>P</i> =.08)	0.429 ( <i>P</i> =.08)	0.358 ( <i>P</i> =.06)	0.912	0.841

<sup>a</sup>FOCUS: Finding impOrtant medical Concepts most Useful to patientS.

<sup>b</sup>FOCUS-base: Finding impOrtant medical Concepts most Useful to patientS; uses only the baseline features.

<sup>c</sup>P5: precision at rank 5.

<sup>d</sup>R5: recall at rank 5.

<sup>e</sup>F5: F-score at rank 5.

<sup>f</sup>P10: precision at rank 10.

<sup>g</sup>R10: recall at rank 10.

<sup>h</sup>F10: F-score at rank 10.

<sup>i</sup>AUC-ROC<sub>ranking</sub>: area under the receiver operating characteristic curve computed on the candidate terms extracted by a system.

<sup>j</sup>AUC-ROC<sub>KE</sub>: area under the receiver operating characteristic curve (KE: keyphrase extraction) computed by using all the gold-standard important terms as positive examples.

<sup>k</sup>+ word embedding: FOCUS-base plus the word embedding feature.

<sup>l</sup>+ UMLS semantic type: FOCUS-base plus the unified medical language system semantic type feature.

<sup>m</sup>+ CHV: FOCUS-base plus the consumer health vocabulary features

<sup>n</sup>+ topic: FOCUS-base plus the topic features

Table A3-2. Performances of different FOCUS<sup>a</sup> systems implemented by using all features or by using only additional feature(s).

System	P5 <sup>b</sup>	R5 <sup>c</sup>	F5 <sup>d</sup>	P10 <sup>e</sup>	R10 <sup>f</sup>	F10 <sup>g</sup>	AUC-ROC <sub>ranking</sub> <sup>h</sup>	AUC-ROC <sub>KE</sub> <sup>i</sup>
FOCUS-full <sup>j</sup>	0.462	0.305	0.341	0.369	0.464	0.381	0.940	0.866
all additional features <sup>k</sup>	0.373	0.245	0.275	0.323	0.393	0.329	0.932	0.859
<i>P</i> (FOCUS-full vs. all additional features)	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001
word embedding <sup>l</sup>	0.322	0.215	0.238	0.279	0.342	0.283	0.909	0.838
<i>P</i> (all additional features vs. word embedding)	.004	.02	.01	<.001	.001	<.001	<.001	<.001
UMLS semantic type <sup>m</sup>	0.229	0.144	0.165	0.220	0.280	0.228	0.873	0.803
CHV <sup>n</sup>	0.096	0.049	0.059	0.081	0.081	0.075	0.735	0.676
topic <sup>o</sup>	0.262	0.161	0.187	0.206	0.261	0.214	0.803	0.742

<sup>a</sup>FOCUS: Finding impOrtant medical Concepts most Useful to patientS.

<sup>b</sup>P5: precision at rank 5.

<sup>c</sup>R5: recall at rank 5.

<sup>d</sup>F5: F-score at rank 5.

<sup>e</sup>P10: precision at rank 10.

<sup>f</sup>R10: recall at rank 10.

<sup>g</sup>F10: F-score at rank 10.

<sup>h</sup>AUC-ROC<sub>ranking</sub>: area under the receiver operating characteristic curve computed on the candidate terms extracted by a system.

<sup>i</sup>AUC-ROC<sub>KE</sub>: area under the receiver operating characteristic curve (KE: keyphrase extraction) computed by using all the gold-standard important terms as positive examples.

<sup>j</sup>FOCUS-full: Finding impOrtant medical Concepts most Useful to patientS; uses all the features.

<sup>k</sup>all additional features: Finding impOrtant medical Concepts most Useful to patientS; uses all the additional features, including word embedding, the unified medical language system semantic type, the consumer health vocabulary features, and the topic features.

<sup>l</sup>word embedding: Finding impOrtant medical Concepts most Useful to patientS; uses only the word embedding feature.

<sup>m</sup>UMLS semantic type: Finding impOrtant medical Concepts most Useful to patientS; uses only the unified medical language system semantic type feature.

<sup>n</sup>CHV: Finding impOrtant medical Concepts most Useful to patientS; uses only the consumer health vocabulary features

<sup>o</sup>topic: Finding impOrtant medical Concepts most Useful to patientS; uses only the topic features