Claims

1. A communication server apparatus for ranking search results, the communication server comprising a processor and a memory, the communication server apparatus being configured, under control of the processor, to execute instructions stored in the memory, to:

store a plurality of sets of search intent identifiers, wherein respective sets of search intent identifiers are associated with different respective levels of semantic granularity, and wherein a first set of the search intent identifiers comprises a set of keyword IDs;

receive a user search request;

computationally map the user search request to one or more estimated keywords, the estimated keywords selected from the set of keyword IDs;

computationally map the one or more estimated keywords to one or more estimated first derived features, the estimated first derived features selected from a second set of the search intent identifiers that is not the set of keyword IDs;

determine one or more behavioural signals based on the one or more estimated keywords and/or the one or more estimated first derived features; and

rank a set of search results based on the user search request and the one or more behavioural signals.

2. The server apparatus of claim 1, wherein the second set of search intent identifiers comprises a set of entity IDs, and the estimated first derived features are one or more estimated entities.

3. The server apparatus of any preceding claim, further configured to determine or extract from the estimated keywords, one or more estimated second derived features selected from a third set of the search intent identifiers that is not the set of keyword IDs.

4. The server apparatus of claim 3, wherein the third set of the search intent identifiers comprises a set of topic IDs, and the second derived features are one or more estimated topics.

5. The server apparatus of claim 3 or 4, wherein the one or more behavioural signals are further determined based on the estimated second derived features.

6. The server apparatus of any one of the preceding claims, wherein the one or more behavioural signals are also determined based on context features, candidate features, and any combination thereof.

7. The server apparatus of any one of the preceding claims, wherein the one or more behavioural signals are also determined based on one or more of: view behaviours, click behaviours, order behaviours, and dwell time.

8. The server apparatus of claim 7, wherein the view behaviours are determined based on the number of times a user views an internet page and one or more corresponding search intent identifiers associated with the respective internet page.

9. The server apparatus of claim 7 or 8, wherein the click behaviours are determined based on the number of times a user clicks to access an internet page and one or more corresponding search intent identifiers associated with the respective internet page.

10. The server apparatus of any of claims 7 to 9, wherein the order behaviours are determined based on transaction parameters in relation to a user and an internet page and one or more corresponding search intent identifiers associated with the respective internet page.

11. The server apparatus of any of claims 7 to 10, wherein the order behaviours are determined based on a dwell time in relation to a user and an internet page and one or more corresponding search intent identifiers associated with the respective internet page.

12. The server apparatus of any preceding claim, further configured to update the set of keyword IDs based on candidate keywords used in a plurality of users' search requests over a predetermined time period, and wherein only the candidate keywords having a frequency above a pre-determined threshold, are used to update the set of keyword IDs.

13. The server apparatus of claim 5, further configured to parse the user search request into a series of tokens, generate an embedding of the series of tokens, and cluster and map the embedding to the estimated second derived features.

~~14. The server apparatus of claim 13, further configured to generate an embedding of the series of tokens.~~

~~15. The server apparatus of claim 14, further configured to cluster and map the embedding to the estimated second derived features.~~

1416. A method performed in a communication server apparatus for ranking search results, the method comprising, under control of a processor of the communication server apparatus:

storing a plurality of sets of search intent identifiers, wherein respective sets of search intent identifiers are associated with different respective levels of semantic granularity, and wherein a first set of the search intent identifiers comprises a set of keyword IDs;

receiving a user search request;

computationally mapping the user search request to one or more estimated keywords, the estimated keywords selected from the set of keyword IDs;

computationally mapping the one or more estimated keywords to one or more estimated first derived features, the estimated first derived features selected from a second set of the search intent identifiers that is not the set of keyword IDs;

determining one or more behavioural signals based on the one or more estimated keywords and/or the one or more estimated first derived features; and

ranking a set of search results based on the user search request, and the one or more behavioural signals.

15~~17~~. A computer program or computer program product comprising instructions for implementing the method of claim 14~~16~~.

16~~18~~. A non-transitory storage medium, storing instructions, which when executed by a processor, causes the processor to perform the method of claim 14~~16~~.

~~19. A user communication device for communicating with a communication server, the communication device comprising a processor and a memory, the communication device being configured, under control of the processor, to execute instructions stored in the memory to:~~
~~send a search request from the user to a server; and~~
~~receive a ranked set of search results from the server, wherein the ranking is based on the user's search request, and one or more behavioural signals, the one or more behavioural signals determined from one or more estimated keywords computationally mapped from the user's search request, and one or more estimated first derived features computationally mapped from the one or more estimated keywords.~~

17~~20~~. A communication system, comprising:

a communication server;

at least one merchant communication device;

at least one user communication device; and

communication network equipment configured to establish communication with the communications server, the at least one merchant communication device, and the at least one user communication device;

wherein the user communication device comprises a first processor and a first memory, the user communications device being configured, under control of the first processor, to execute first instructions stored in the first memory to:

request the communication server provide search results;

and wherein the communication server comprises a second processor and a second memory, the communication server being configured, under control of the second processor, to execute second instructions stored in the second memory to:

store a plurality of sets of search intent identifiers, wherein respective sets of search intent identifiers are associated with different respective levels of semantic granularity, and wherein a first set of the search intent identifiers comprises a set of keyword IDs;

receive a user search request;

computationally map the user search request to one or more estimated keywords, the estimated keywords selected from the set of keyword IDs;

computationally map the one or more estimated keywords to one or more estimated first derived features, the estimated first derived features selected from a second set of the search intent identifiers that is not the set of keyword IDs;

determining one or more behavioural signals based on the one or more estimated keywords and/or the one or more estimated first derived features; and

rank a set of search results based on the user search request, and the one or more behavioural signals;

and wherein the merchant communication device comprises a third processor and a third memory, the merchant communication device being configured, under control of the third processor, to execute first instructions stored in the third memory to:

receive data regarding a transaction in relation to the ranked set of search results from the communication server.

18~~21~~. A method performed in a communication server apparatus for ranking search results, the method comprising, under control of a processor of the communication server apparatus:

computationally mapping a user search request to one or more estimated keywords;

computationally mapping the one or more estimated keywords to one or more estimated entities;

parsing the user search request into a series of tokens;

generate an embedding of the series of tokens;

clustering and mapping the embeddings to one or more estimated topics; and

ranking a set of search results based on the user search request, the estimated keywords, the estimated entities and/or the estimated topics.

19~~22~~. A computer program or computer program product, comprising instructions for implementing the method of claim 18~~21~~.

20~~23~~. A non-transitory storage medium, storing instructions, which when executed by a processor, causes the processor to perform the method of claim 18~~21~~.