**CLAIM**

1. A system for training a machine learning model with a geographical location comprising:

an input device configured to obtain a geolocation index for the geographical location; and

a processor configured to train the machine learning model in relation to the geographical location,

wherein the processor is further configured to split the geolocation index into a plurality of geolocation indexes each having different scales, embed each of the plurality of geolocation indexes to obtain a plurality of values relating to latitude and longitude for the plurality of geolocation indexes respectively, aggregate the plurality of values to obtain a representation value of the geographical location, and train the machine learning model using the representation value of the geographical location, and

the processor is further configured to calculate an average of the plurality of values to obtain the representation value of the geographical location.

2. The system according to claim 1, wherein the plurality of geolocation indexes each having different scales includes the obtained geolocation index and one or more coarser level geolocation indexes than the obtained geolocation index.

3. The system according to claim 1 or claim 2, wherein the geolocation index includes a geohash.

4. The system according to claim 3, wherein where the geolocation index is the geohash, the processor is configured to gradually remove one or more characters from an end of the geohash to obtain one or more geohashes each having different scales.

5. The system according to claim 4, wherein number of a plurality of geohashes each having different scales is same as a length of the geohash.

6. The system according to any one of claims 3 to 5, wherein the processor is configured to embed the each of the plurality of geolocation indexes by latitude-longitude embedding, and geohash embedding for naive embedding.

~~7. The system according to any one of claims 1 to 6, wherein the processor is configured to calculate an average of the plurality of values to obtain the representation value of the geographical location.~~

8<u>7</u>. The system according to any one of claims 1 to ~~7~~<u>6</u>, wherein the processor is further configured to train the machine learning model based on a set of observed data points, and embed the representation value of the geographical location into the machine learning model.

9<u>8</u>. A method of training a machine learning model with a geographical location comprising:

obtaining a geolocation index for the geographical location;

splitting the geolocation index into a plurality of geolocation indexes each having different scales;

embedding each of the plurality of geolocation indexes to obtain a plurality of values relating to latitude and longitude for the plurality of geolocation indexes respectively;

aggregating the plurality of values to obtain a representation value of the geographical location; and

training the machine learning model using the representation value of the geographical location,

wherein the aggregating the plurality of values comprises: calculating an average of the plurality of values to obtain the representation value of the geographical location.

~~10~~9. The method according to claim ~~9~~8, wherein the plurality of geolocation indexes each having different scales includes the obtained geolocation index and one or more coarser level geolocation indexes than the obtained geolocation index.

~~11~~10. The method according to claim ~~9~~ 8 or claim ~~10~~9, wherein the geolocation index includes a geohash.

~~12~~11. The method according to claim ~~11~~10, wherein where the geolocation index is the geohash, the method further comprises: gradually removing one or more characters from an end of the geohash to obtain one or more geohashes each having different scales.

~~13~~12. The method according to claim ~~12~~11, wherein number of a plurality of geohashes each having different scales is same as a length of the geohash.

~~14~~13. The method according to any one of claims ~~11~~ 10 to ~~13~~12, wherein the embedding each of the plurality of geolocation indexes comprises: embedding the each of the plurality of geolocation indexes by latitude-longitude embedding, and geohash embedding for naive embedding.

~~15. The method according to any one of claims 9 to 14, wherein aggregating the plurality of values comprises: calculating an average of the plurality of values to obtain the representation value of the geographical location~~.

~~16~~14. The method according to any one of claims ~~9~~ 8 to ~~15~~13, wherein the training the machine learning model comprises:

training the machine learning model based on a set of observed data points; and

embedding the representation value of the geographical location into the machine learning model.

~~17~~15. A data processing apparatus configured to perform the method of any one of claims ~~9~~ 8 to ~~16~~14.

~~18~~16. A computer program element comprising program instructions, which, when executed by one or more processors, cause the one or more processors to perform the method of any one of claims ~~9~~ 8 to ~~16~~14.