CLAIMS

1. A method for detecting fraudulent users in a marketplace system, comprising:
Generating a graph, wherein users are represented as nodes of the graph and two nodes are connected by an edge if the user represented by one of the nodes has used at least one marketplace system element which was also used by the user represented by the other of the nodes in the marketplace system and each node is associated with a feature set including information about behaviour of the user who is represented by the node in the marketplace system and structure information about a subgraph of the graph to which the node belongs, wherein the marketplace system element is a user device, an Internet protocol address, a merchant, a driver or a vehicle;
Processing the graph by a graph convolutional neural network configured to generate a score for each node of the graph; and
Detecting one or more fraudulent users using the scores.

2. The method of claim 1, wherein the structure information about the subgraph of the graph to which the node belongs includes information about how the node is connected to other nodes of the graph.

3. The method of claim 1 or 2, wherein the structure information about the subgraph of the graph to which the node belongs includes at least one of the quantity of other nodes connected to the node, information on how densely the node is connected to other nodes and the quantity of nodes of the subgraph, wherein the subgraph is the largest connected subgraph of the graph to which the node belongs.

4. The method of any one of claims 1 to 3, wherein the information about the behaviour of the user includes information indicative of the integrity of the user.

5. The method of any one of claims 1 to 4, wherein the marketplace system is an online to offline marketplace system.

~~6. The method of claim 5, wherein the marketplace system element is an online channel or an offline channel of the online to offline marketplace system.~~

~~7. The method of any one of claims 1 to 6, wherein the marketplace system element is a user device, an Internet protocol address, a merchant, a driver or a vehicle.~~

~~8~~6. The method of any one of claims 1 to ~~7~~5, wherein the graph convolutional neural network is configured to generate an embedding of each node and is configured to generate, for each node, the score for the node from the embedding of the node.

~~9~~7. The method of any one of claims 1 to ~~8~~6, wherein the information about the behaviour of the user includes one or more of an age of an account the user has with the marketplace system, a number of orders issued by the user in the marketplace system, a ratio of promotion orders among the orders issued by the user in the marketplace system, an average order value of the user in the marketplace system, a time since the last login by the user in the marketplace system, a time since the last order by the user in the marketplace system, a total profit of the user in the marketplace system.

~~10~~8. The method of any one of claims 1 to ~~9~~7, comprising detecting one or more fraudulent users using the scores by detecting a user as being a fraudulent user if the score of the node lies within a predetermined range.

~~11~~9. The method of any one of claims 1 to ~~10~~8, comprising activating a security measure for a user if the user was detected as fraudulent user.

~~12~~10. The method of any one of claims 1 to ~~11~~9, comprising training the graph convolutional neural network by semi-supervised training using a labelled training data set comprising labels indicating fraudulent users.

~~13~~11. A server computer system comprising a radio interface, a memory interface and a processing unit configured to perform the method of any one of claims 1 to ~~12~~10.

~~14~~12. 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 1 to ~~12~~10.

~~15~~13. A computer-readable medium 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 1 to ~~12~~10.