Claims

1. A system for determining nonlinear surge pricing, comprising:

memory; and

a processing system comprising one or more processors, the memory storing instructions that, when executed by the processing system, cause the system to:

obtain historical data relating to uses of a service by one or more users, and provision of the service by one or more providers, wherein the data relating to the uses of the service and provision of the service comprise service parameters for a plurality of requested uses of the service;

determine a user pricing elasticity model and a provider pricing elasticity model from the data relating to the uses of the service and provision of the service by:

applying coefficients to the service parameters to produce modified service parameters, and

using linear regression on the modified service parameters,

wherein a sign of coefficients is constrained to maintain causality between, for each requested use of the service, the service parameters and usage of the service;

obtain an original nonlinear surge pricing model;

optimise an objective function based on a weighted combination of a predicted number of uses of the service and a predicted gross merchandise value (predicted GMV), the original nonlinear surge pricing model, the service parameters and one or both of the user pricing elasticity model and the provider pricing elasticity model;

identify a level of service in a new request for use of the service; and

output an augmented surge multiplier for the new request for use of the service, based on the optimised objective function

and a surge multiplier determined from the original surge pricing, and the level of service identified in the new request for use of the service.

2. The system of claim 1, wherein the requested uses of the service comprise cancelled uses.

3. The system of claim 1, wherein the system receives one or more limits each limit defining a minimum or maximum surge multiplier, and the objective function is optimised within the limit or limits.

4. The system of claim 3, wherein the one or more limits include a minimum ratio, and a maximum ratio, between a surge price determined from the original nonlinear surge pricing model and a surge price determined from the augmented surge multiplier.

5. The system of claim 1, wherein the system is configured to determine the weighted combination by applying a number between "0" and "1" for each of the predicted number of uses and the predicted GMV.

6. The system of claim 5, wherein the system is configured to determine the weighted combination by applying a "0" for one of the predicted number of uses and the predicted GMV, and a "1" for the other of the predicted number of uses and the predicted GMV.

7. The system of claim 1, wherein the service parameters comprise a level of service and the system optimises the objective function separately for each level of service.

8. The system of claim 7, wherein each of the plurality of requested uses of the service comprise a level of service, and wherein system determines a separate user pricing elasticity model and provider pricing elasticity model for each level of service.

9. The system of claim 7, wherein outputting the augmented surge multiplier comprises outputting a separate augmented surge multiplier for each level of service.

10. A method for determining nonlinear surge pricing, comprising:

obtaining historical data relating to uses of a service by one or more users, and provision of the service by one or more providers, wherein the data relating to the uses of the service and provision of the service comprise service parameters for a plurality of requested uses of the service;

determining a user pricing elasticity model and a provider pricing elasticity model from the data relating to the uses of the service and provision of the service by:

applying coefficients to the service parameters to produce modified service parameters, and

using linear regression on the modified service parameters,

wherein a sign of coefficients is constrained to maintain causality between, for each requested use of the service, the service parameters and usage of the service;

obtaining an original nonlinear surge pricing model;

optimising an objective function based on a weighted combination of a predicted number of uses of the service and a predicted gross merchandise value (predicted GMV), the original nonlinear surge pricing model, the service parameters and one or both of the user pricing elasticity model and the provider pricing elasticity model;

identifying a level of service in a new request for use of the service; and

outputting an augmented surge multiplier for the new request for use of the service, based on the optimised objective function, a surge multiplier determined from the original surge pricing, and the level of service identified in the new request for use of the service.

11. The method of claim 10, wherein the requested uses of the service comprise cancelled uses.

12. The method of claim 10, comprising receiving one or more limits each limit defining a minimum or maximum surge multiplier, and wherein the objective function is optimised within the limit or limits.

13. The method of claim 12, wherein the one or more limits include a minimum ratio, and a maximum ratio, between a surge price determined from the original nonlinear surge pricing model and a surge price determined from the augmented surge multiplier.

14. The method of claim 10, comprising determining the weighted combination by applying a number between "0" and "1" for each of the predicted number of uses and the predicted GMV.

15. The method of claim 14, comprising determining the weighted combination by applying a "0" for one of the predicted number of uses and the predicted GMV, and a "1" for the other of the predicted number of uses and the predicted GMV.

16. The method of claim 10, wherein the service parameters comprise a level of service and the method optimises the objective function separately for each level of service.

17. The method of claim 16, wherein each of the plurality of requested uses of the service comprise a level of service, and wherein the method comprises determining a separate user pricing elasticity model and provider pricing elasticity model for each level of service.

18. The method of claim 16, wherein the method outputs the augmented surge multiplier by outputting a separate augmented surge multiplier for each level of service.