

CLAIMS

What is claimed is:

1. A system comprising:
 - one or more processors; and
 - memory coupled to at least one of the one or more processors, the memory comprising computer executable instructions that, when executed by the at least one processor, performs a method comprising:
 - receiving visit information associated with one or more users, wherein the one or more users have been exposed to directed information;
 - receiving impression information relating to the directed information, wherein the impression information is associated with at least a user of the one or more users;
 - generating a plurality of feature vectors corresponding to a plurality of features for at least one of the visit information or the impression information, wherein the plurality of feature vectors are generated using a machine learning featurization operation;
 - identifying an attribution window associated with the directed information;
 - providing the visit information and the impression information within the attribution window to a machine learning model to determine an expected visit rate for the one or more users for each day of the attribution window, wherein the machine learning model is trained based at least upon a merged data set comprising the visit information and the impression information, the merged data set comprising a combined data set of users who were exposed to prior directed information and users who were not exposed to prior directed information, wherein the machine learning model is a binary logistic regression model used to determine a probability the one or more users identified in the merged data visited a location on a specified date, and wherein data associated with a plurality of features are grouped within the merged data set;
 - determining an actual visit rate for the one or more users; and
 - determining a visit lift rate based upon an evaluation of the expected visit rate, determined by the machine learning model, against the actual visit rate; and
 - automatically generating a report detailing the effectiveness of the directed information, wherein the report comprises at least a subset of the plurality of

- features and an estimated causal impact of at least the subset of the plurality of features; and
providing the report.
2. The system of claim 1, wherein the visit information is collected from a contextual awareness engine that records user visitation patterns to locations.
 3. The system of claim 1, wherein the attribution window defines a date of exposure to the directed information and a number of days subsequent to the date of exposure.
 4. The system of claim 1, wherein the machine learning model is a binary logistic regression model.
 5. The system of claim 1, wherein the expected visit rate represents a probability that the one or more users visited one or more locations on one or more days.
 6. The system of claim 1, wherein the actual visit rate represents a number of visits that actually occurred by users during the attribution window.
 7. The system of claim 1, wherein the visit lift rate represents a percentage increase in visit rate attributable to the directed information.
 8. The system of claim 1, wherein calculating the visit lift rate comprises dividing the actual visit rate by the expected visit rate.
 9. The system of claim 1, wherein the method further comprises:
performing one or more actions responsive to calculating the visit rate lift, wherein the one or more actions include automatically generating a report.
 10. A method comprising:
receiving visit information associated with one or more users, wherein the one or more users have been exposed to directed information;
receiving impression information relating to the directed information, wherein the impression information is associated with at least a user of the one or more users;
generating a plurality of feature vectors corresponding to a plurality of features for at least one of the visit information or the impression information, wherein the plurality of feature vectors are generated using a machine learning featurization operation;
identifying an attribution window associated with the directed information;
providing the visit information and the impression information within the attribution window to a machine learning model to determine an expected visit rate for the one or more users for each day of the attribution window, wherein the machine learning model is trained based at least upon a merged data set comprising the visit information and the impression information, the merged data set comprising a combined data set of users

who exposed to prior directed information and users who were not exposed to prior directed information, wherein the machine learning model is a binary logistic regression model used to determine a probability the one or more users identified in the merged data visited a location on a specified date, and wherein data associated with a plurality of features are grouped within the merged data set;

determining an actual visit rate for users during the attribution window; and
determining a visit lift rate using the expected visit rate and the actual visit rate, wherein the visit lift rate represents an increase in visit rate attributable to exposure to the directed information;

automatically generating a report detailing the effectiveness of the directed information, wherein the report comprises at least a subset of the plurality of features and an estimated causal impact of at least the subset of the plurality of features; and
providing the report.