We have provided an accurate dataset describing a complete year (from 01/07/2013 to 30/06/2014) of the trajectories for all the 442 taxis running in the city of Porto, in Portugal (i.e. one CSV file named "train.csv"). These taxis operate through a taxi dispatch central, using mobile data terminals installed in the vehicles. We categorize each ride into three categories: A) taxi central based, B) stand-based or C) non-taxi central based. For the first, we provide an anonymized id, when such information is available from the telephone call. The last two categories refer to services that were demanded directly to the taxi drivers on a B) taxi stand or on a C) random street.

Each data sample corresponds to one completed trip. It contains a total of   
9 (nine) features, described as follows:

1. **TRIP\_ID**: (String) It contains an unique identifier for each trip;
2. **CALL\_TYPE**: (char) It identifies the way used to demand this service. It may contain one of three possible values:
   1. ‘A’ if this trip was dispatched from the central;
   2. ‘B’ if this trip was demanded directly to a taxi driver on a specific stand;
   3. ‘C’ otherwise (i.e. a trip demanded on a random street).
3. **ORIGIN\_CALL**: (integer) It contains an unique identifier for each phone number which was used to demand, at least, one service. It identifies the trip’s customer if CALL\_TYPE=’A’. Otherwise, it assumes a NULL value;
4. **ORIGIN\_STAND**: (integer): It contains an unique identifier for the taxi stand. It identifies the starting point of the trip if CALL\_TYPE=’B’. Otherwise, it assumes a NULL value;
5. **TAXI\_ID**: (integer): It contains an unique identifier for the taxi driver that performed each trip;
6. **TIMESTAMP**: (integer) Unix Timestamp (in seconds). It identifies the trip’s start;
7. **DAYTYPE**: (char) It identifies the daytype of the trip’s start. It assumes one of three possible values:
   1. ‘B’ if this trip started on a holiday or any other special day (i.e. extending holidays, floating holidays, etc.);
   2. ‘C’ if the trip started on a day before a type-B day;
   3. ‘A’ otherwise (i.e. a normal day, workday or weekend).
8. **MISSING\_DATA**: (Boolean) It is FALSE when the GPS data stream is complete and TRUE whenever one (or more) locations are missing
9. **POLYLINE**: (String): It contains a list of GPS coordinates (i.e. WGS84 format) mapped as a string. The beginning and the end of the string are identified with brackets (i.e. [ and ], respectively). Each pair of coordinates is also identified by the same brackets as [LONGITUDE, LATITUDE]. This list contains one pair of coordinates for each 15 seconds of trip. The last list item corresponds to the trip’s destination while the first one represents its start;

**II. Testing**

Five test sets will be available to evaluate your predictive framework (in one single CSV file named "test.csv"). Each one of these datasets refer to trips that occurred between 01/07/2014 and 31/12/2014. Each one of these data sets will provide a snapshot of the current network status on a given timestamp. It will provide partial trajectories for each one of the on-going trips during that specific moment.

The five snapshots included on the test set refer to the following timestamps:

14/08/2014 18:00:00  
30/09/2014 08:30:00  
06/10/2014 17:45:00  
01/11/2014 04:00:00  
21/12/2014 14:30:00

**III. Sample Submission Files**

File sampleSubmission.csv uses the location of Porto main Avenue, in downtown (i.e. Avenida dos Aliados).

**IV. Other Files**

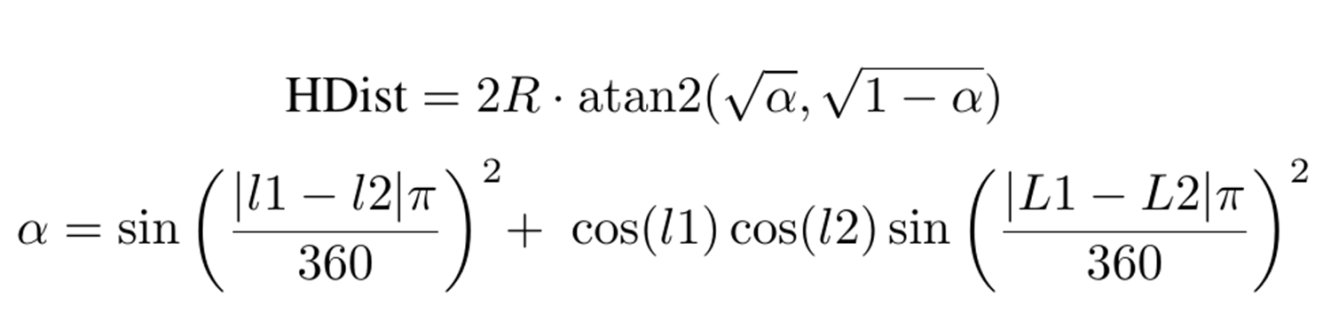
Along with these two files, we have also provided two additional files. One contains meta data regarding the taxi stands metaData\_taxistandsID\_name\_GPSlocation.csv including id and location.

The second one includes an evaluation script for both problems developed in the R language ("evaluation\_script.r").

# Evaluation

The evaluation metric for this competition is the **Mean Haversine Distance**. The [Haversine Distance](http://en.wikipedia.org/wiki/Haversine_formula) is commonly used in navigation. It measures distances between two points on a sphere based on their latitude and lagitude.

Let P1,P2 be two points which location is given by the [WGS84](http://en.wikipedia.org/wiki/World_Geodetic_System) coordinates (l1,L1) and (l2,L2), respectively. The Harvesine Distance between the two locations P1, P2 (**HDist**) can be computed as follows



where R is the sphere's radius. In our case, it should be replaced by the Earth's radius in the desired metric (e.g., kilometers).

## Submission Format

**For every trip in the dataset**, submission files should contain three columns: TRIP\_ID, LATITUDE, and LONGITUDE. TRIP\_ID represents the ID of the trip for which you are predicting the destination (i.e. a string). The LATITUDE/LONGITUDE represent the location's coordinates (using [WGS84](http://en.wikipedia.org/wiki/World_Geodetic_System) format) of your predicted destination

The file should contain a header and have the following format:

TRIP\_ID, LATITUDE, LONGITUDE  
T1, 41.146504,-8.611317  
T2, 42.230000,-8.629454  
T10, 42.110000,-8.721111  
etc.

# Competition Rules

### One account per participant

You cannot sign up to Kaggle from multiple accounts and therefore you cannot submit from multiple accounts.

### No private sharing outside teams

Privately sharing code or data outside of teams is not permitted. It's okay to share code if made available to all participants on the forums.

### Public dissemination of entries

Kaggle and the competition host have the right to publicly disseminate any entries or models.

### Open licensing of winners

Winning solutions need to be made available under [a popular OSI-approved license](http://opensource.org/licenses) in order to be eligible for recognition and prize money.

### Winning solutions must be posted or linked to in the forums.

Prizes will be awarded after the winners have posted their solutions to the competition forum. Winners must post or link to their solutions within fourteen (14) days of being notified of their winning status.

### Team Mergers

Team mergers are allowed and can be performed by the team leader. In order to merge, the combined team must have a total submission count less than or equal to the maximum allowed as of the merge date. The maximum allowed is the number of submissions per day multiplied by the number of days the competition has been running.

### Team Limits

There is no maximum team size.

### Submission Limits

You may submit a maximum of 2 entries per day.

You may select up to 2 final submissions for judging.

### Competition Timeline

Start Date: **4/20/2015 7:04:52 PM UTC**

Merger Deadline: **6/24/2015 11:59:00 PM UTC**

First Submission Deadline: **6/24/2015 11:59:00 PM UTC**

End Date: **7/1/2015 11:59:00 PM UTC**

### COMPETITION-SPECIFIC TERMS

COMPETITION NAME (the 'Competition'):ECML/PKDD 15: Taxi Service Trajectory Prediction (I)

COMPETITION SPONSOR: ECML/PKDD

COMPETITION WEBSITE: https://www.kaggle.com/c/pkdd-15-predict-taxi-service-trajectory-i

PRIZES: First Place - $250

WINNER LICENSE TYPE: Open Source License

### COMPETITION FRAMEWORK

These are the complete, official rules for the Competition (the 'Competition Rules') and incorporate by reference the contents of the Competition Website listed above.

By downloading a dataset linked from the Competition Website, submitting an entry to this Competition, or joining a Team in this Competition, you are agreeing to be bound by these Competition Rules which constitute a binding agreement between you and the Competition Sponsor.

The Competition is sponsored by the Competition Sponsor listed above and hosted on the Sponsor's behalf by Kaggle Inc ('Kaggle').

The Competition will run from Start Date to End Date as listed on the Competition Website. Note that Competition deadlines are subject to change and additional hurdle deadlines may be introduced during the Competition. Any additional or altered deadlines not already described in these Competition Rules will be publicized to the Participants via the Competition Website. It is the Participant's responsibility in this Competition to check the website regularly throughout the Competition to stay informed of any new or updated deadlines. Neither Kaggle nor Competition Sponsor are responsible for any Participant's failure to do so.

Each registered individual or Team is referred to as a Participant. You may only participate using a single, unique Kaggle account registered at http://www.kaggle.com. Participating using more than one Kaggle account per individual Participant is a breach of these Competition Rules and Competition Sponsor reserves the right to disqualify any Participant (or Team including Participant) who is found to breach these Competition Rules.

### ELIGIBILITY

The Competition is open to all individuals over the age of 18 at the time of entry and to all validly formed legal entities that have not declared or been declared in bankruptcy.

Officers, directors, employees and advisory board members (and their immediate families and members of the same household) of the Competition Sponsor, Kaggle and their respective affiliates, subsidiaries, contractors (with the express exception of Kaggle's authorized Kaggle Community Evangelists), agents, judges and advertising and promotion agencies are not eligible to participate in the Competition.

You are not eligible to receive any Prize in the Competition if you are a resident of a country designated by the United States Treasury’s Office of Foreign Assets Control (see <http://www.treasury.gov/resource-center/sanctions/SDN-List/Pages/default.aspx> for additional information).

### SUBMISSIONS

'Submission' means the material submitted by you in the manner and format specified on the Website via the Submission form on the Website. You (or if you are part of a Team, your Team) may submit up to the maximum number of Submissions per day as specified above. All Submissions must be uploaded to the Website in the manner and format specified on the Website. Submissions must be received prior to the Competition deadline and adhere to the guidelines for Submissions specified on the Website.

Submissions may not use or incorporate information from hand labeling or human prediction of the validation dataset or test data records.

If the Competition is a multi-stage Competition with temporally separate training data and/or leaderboard data, one or more valid Submissions must be made and selected during each stage of the Competition in the manner described on the Competition Website.

### INTELLECTUAL PROPERTY

#### DATA

'Data' means the Data or Datasets linked from the Competition Website for the purpose of use by Participants in the Competition. For the avoidance of doubt, Data is deemed for the purpose of these Competition Rules to include any prototype or executable code provided to Participants by Kaggle or Competition Sponsor via the Website. Participants must use the Data only as permitted by these Competition Rules and any associated data use rules specified on the Competition Website.

Unless otherwise permitted by the terms of the Competition Website, Participants must use the Data solely for the purpose and duration of the Competition, including but not limited to reading and learning from the Data, analyzing the Data, modifying the Data and generally preparing your Submission and any underlying models and participating in forum discussions on the Website. Participants agree to use suitable measures to prevent persons who have not formally agreed to these Competition Rules from gaining access to the Data and agree not to transmit, duplicate, publish, redistribute or otherwise provide or make available the Data to any party not participating in the Competition. Participants agree to notify Kaggle immediately upon learning of any possible unauthorized transmission or unauthorized access of the Data and agree to work with Kaggle to rectify any unauthorized transmission. Participants agree that participation in the Competition shall not be construed as having or being granted a license (expressly, by implication, estoppel, or otherwise) under, or any right of ownership in, any of the Data.

#### EXTERNAL DATA

Unless otherwise expressly stated on the Competition Website, Participants must not use data other than the Data to develop and test their models and Submissions. Competition Sponsor reserves the right in its sole discretion to disqualify any Participant who Competition Sponsor discovers has undertaken or attempted to undertake the use of data other than the Data, or who uses the Data other than as permitted according to the Competition Website and in these Competition Rules, in the course of the Competition.

#### CODE SHARING

Participants are prohibited from privately sharing source or executable code developed in connection with or based upon the Data, and any such sharing is a breach of these Competition Rules and may result in disqualification.

Participants are permitted to publicly share source or executable code developed in connection with or based upon the Data, or otherwise relevant to the Competition, provided that such sharing does not violate the intellectual property rights of any third party. By so sharing, the sharing Participant is thereby deemed to have licensed the shared code under the MIT License (an open source software license commonly described at <http://opensource.org/licenses/MIT>).

#### OPEN-SOURCE CODE

A Submission will be ineligible to win a prize if it was developed using code containing or depending on software licensed under an open source license:

\* other than an Open Source Initiative-approved license (see <http://opensource.org/>); or  
\* an open source license that prohibits commercial use.

### WINNING

#### DETERMINING WINNERS

This Competition is a challenge of skill and the final results are determined solely by leaderboard ranking on the private leaderboard (subject to compliance with these Competition Rules). Participants' scores and ranks on the Competition Website at any given stage of the Competition will be based on the evaluation metric described on the Competition Website, as determined by applying the predictions in the Submission to the ground truth of a validation dataset whose instances were a fixed set sampled from the Data.

The evaluation metric used for scoring and ranking Submissions will be displayed on the Competition Website.

Prize awards are subject to verification of eligibility and compliance with these Competition Rules. All decisions of the Competition Sponsor and judges will be final and binding on all matters relating to this Competition. Competition Sponsor reserves the right to examine the Submission and any associated code or documentation for compliance with these Competition Rules. In the event that the Submission demonstrates a breach of these Competition Rules, Competition Sponsor may at its discretion take either of the following actions:

\* disqualify your Submission(s); or   
\* require that you remediate within one week all issues identified in your Submission(s) (including, without limitation, the resolution of license conflicts, the fulfillment of all obligations required by software licenses, and the removal of any software that violates the software restrictions).

Evaluation   
The ECML/PKDD organization will select a panel of judges to judge the entries; all judges will be forbidden to enter the contest and will be experts in causality, statistics, machine learning, or a related field, or experts in challenge organization. The judges will review all eligible entries received and select [two] winners based upon the prediction score on test data.

The entries will be evaluated regarding the (1) Mean Haversine Distance and the (2) Root Mean Squared Error, regarding the destination and the travel time prediction problems, respectively. The organizers may also analyze the methods results using other metrics, but this will not affect the final ranking.

The decisions of the judges are final and binding. The distribution of prizes according to the decisions made by the judges will be made within two (2) months after completion of the last round of the contest (preferentially during the ECML/PKDD venue). If we do not receive a sufficient number of entries meeting the entry requirements, we may, at our discretion based on the above criteria, not award any or all of the contest prizes below. In the event of a tie between any eligible entries, the tie will be broken by giving preference to the earliest submission, using the time stamp of the submission platform. In the event of a tie between any eligible entries, the tie will be broken by giving preference to the earliest submission, using the time stamp of the submission platform.

#### 

#### RESOLVING TIES

A tie between two or more valid and identically ranked submissions will be resolved in favour of the tied submission that was submitted first.

#### DECLINING PRIZES

A Participant may decline to be nominated as a Winner by notifying Kaggle directly within one week following the Competition deadline, in which case the declining Participant forgoes any prize or other features associated with winning the Competition. Kaggle reserves the right to disqualify a Participant who so declines at Kaggle's sole discretion if Kaggle deems disqualification appropriate.

### WINNERS' OBLIGATIONS

#### DELIVERY & DOCUMENTATION

As a condition of receipt of the Prize, the Prize winner must deliver the final model’s software code as used to generate the winning Submission and associated documentation (consistent with the winning model documentation template available on the kaggle wiki at https://www.kaggle.com/wiki/WinningModelDocumentationTemplate) to the Competition Sponsor. The delivered software code must be capable of generating the winning Submission and contain a description of resources required to build and/or run the executable code successfully.

If a potential winning Participant or Team member is a U.S. citizen, potential winner must also sign and return an IRS W-9 form, or if a foreign resident, an IRS W-8BEN form, within the stated time in order to claim the prize.

Potential winners will be disqualified and the prize may be awarded to an alternate winner (the next-ranked qualified Participant on the leaderboard) if

\* the required documentation is not returned within 14 days after receipt of any request to provide documentation;  
\* prize notification letter/email or prize is returned as undeliverable; or  
\* potential winner or winning Team member is disqualified for any reason.

By accepting any Prize, each Participant receiving a Prize thereby agrees to use of his/her name, address, likeness and/or Prize information by Kaggle and Competition Sponsor for promotional purposes in any medium without additional compensation.

Workshop paper: To receive the final prize, the participants will be required to publish a detailed paper in the proceedings of the ECML/PKDD workshop.

#### PARTICIPANT INTELLECTUAL PROPERTY LICENSING

As a further condition of receipt of a Prize, each winning Participant thereby licenses their winning Submission and the source code used to generate the Submission according to the Winner License Type specified above (note: if no Winner License Type is specified above, the Winner License Type is deemed to be Non-Exclusive License).

##### PUBLIC COMPETITIONS: NON-EXCLUSIVE LICENSE

If the Winner License Type for the Competition (see Winner License Type above) is a Non-Exclusive License then each Winner by accepting a Prize thereby:

\* grants to Competition Sponsor and its designees a worldwide, non-exclusive, sub-licensable, transferable, fully paid-up, royalty-free, perpetual, irrevocable right to use, not use, reproduce, distribute, create derivative works of, publicly perform, publicly display, digitally perform, make, have made, sell, offer for sale and import their winning Submission and the source code used to generate the Submission, in any media now known or hereafter developed, for any purpose whatsoever, commercial or otherwise, without further approval by or payment to Participant; and  
\* represents that he/she/it has the unrestricted right to grant that license.

##### RESEARCH COMPETITIONS: OPEN SOURCE LICENSE

If the Winner License Type for the Competition (see Winner License Type above) is Open Source License, then each Winner by accepting a Prize thereby:

\* licenses their winning Submission and the source code used to generate the Submission under the MIT License (an open source software license commonly described at <http://opensource.org/licenses/MIT>), unless another open source license is chosen explicitly from the list of those approved by the Open Source Initiative at <http://opensource.org/licenses/>; and  
\* represents that he/she/it has the unrestricted right to grant that license.

##### RECRUITING COMPETITION SUBMISSION LICENSE GRANT

If the Competition is classed above as a Recruiting Competition, Participant agrees to grant and hereby grants to Competition Sponsor a perpetual, irrevocable, worldwide, royalty-free, transferable, and sublicenseable right to use, review, reproduce, and internally distribute the Submission (including any and all submitted source code) in connection with evaluating Participant's suitability for employment, provided that the Submission licensed as set forth above will not be used for Competition Host’s commercial purposes except as may otherwise be set forth in this Agreement.

#### CHEATING

Participating using more than one Kaggle account is deemed cheating and, if discovered, will result in disqualification from the Competition and any other affected Competitions and may result in banning or deactivation of affected Kaggle accounts.

#### RECEIVING PRIZES

After verification of eligibility, each Prize winner will receive the prize in the form of a check or wire transfer made out to the Prize winner (if an individual, or to the individual Team members if a Team). Allow 30 days from final confirmation for Prize delivery. Any winners who are U.S. citizens will receive an IRS 1099 form in the amount of their prize at the appropriate time. Prize winners are responsible for any taxes, fees or other liability resulting from their receipt of a Prize.

### TEAMS

#### FORMING A TEAM

Multiple individuals or entities may collaborate as a team (“Team”). You may not participate on more than one Team. Each Team member must be a single individual operating a separate Kaggle account. You must register individually for the Competition before joining a Team. You must confirm your Team membership to make it official by responding to the Team notification message which will be sent to your Account.

Team membership may not exceed the Maximum Team Size.

#### TEAM MERGERS

Teams may be permitted to merge at Kaggle’s discretion, so long as the merged Team meets all requirements in these Competition Rules. Kaggle will review any merger request and will either approve or reject the request within three business days. Merger requests may be rejected if the combined number of Entries made by the merging Teams exceeds the number of Entries permissible at the date of the merger request. Team merger requests will not be permitted within seven days of any deadline listed on the Competition Website.

#### TEAM PRIZES

If a Team wins a monetary Prize, Competition Sponsor will allocate the Prize money in even shares between the Team members unless the Team unanimously contacts Kaggle via the Competition Website within three business days following the Submission deadline to request an alternative prize distribution.

### WARRANTIES AND OBLIGATIONS

#### PARTICIPANT WARRANTIES AND OBLIGATIONS

By registering, you agree that (a) your Account is complete, correct and accurate and (b) your registration may be rejected or terminated and all Entries submitted by you and/or your Team may be disqualified if any of the information in your Account is (or Competition Sponsor has reasonable grounds to believe it is) incomplete, incorrect or inaccurate. You are solely responsible for your Account. All registration information is deemed collected in the United States.

Participation is subject to all federal, state and local laws and regulations. Void where prohibited or restricted by law. You are responsible for checking applicable laws and regulations in your jurisdiction before participating in the Competition to make sure that your participation is legal. You are responsible for all taxes and reporting related to any award that you may receive as part of the Competition. You are responsible for abiding by your employer's policies regarding participation in the Competition. Competition Sponsor disclaims any and all liability or responsibility for disputes arising between you and your employer related to this Competition.

Each Participant is solely responsible for all equipment, including but not necessarily limited to a computer and internet connection necessary to access the Website and to develop and upload any Submission, and any telephone, data, hosting or other service fees associated with such access, as well as all costs incurred by or behalf of the Entrant in participating in the Competition.

By entering a Submission, you represent and warrant that all information you enter on the Website is true and complete to the best of your knowledge, that you have the right and authority to make the Submission (including any underlying code and model) on your own behalf or on behalf of the persons and entities that you specify within the Submission, and that your Submission:

\* is your own original work, or is used by permission, in which case full and proper credit and identify is given and the third party contributions are clearly identified within your Submission;  
\* does not contain confidential information or trade secrets and is not the subject of a registered patent or pending patent application;  
\* does not violate or infringe upon the patent rights, industrial design rights, copyrights, trademarks, rights of privacy, publicity or other intellectual property or other rights of any person or entity;  
\* does not contain malicious code, such as viruses, timebombs, cancelbots, worms, Trojan horses or other potentially harmful programs or other material or information;   
\* does not and will not violate any applicable law, statute, ordinance, rule or regulation;  
\* does not trigger any reporting or royalty obligation to any third party; and  
\* was not previously published and has not won any other prize/award.   
A breach of any of these warranties will result in the corresponding Submission being invalid.

#### LIMITATION OF LIABILITY

By participating in the Competition, each Participant agrees to release, indemnify and hold harmless Competition Sponsor, Kaggle, their respective affiliates, subsidiaries, advertising and promotions agencies, as applicable, and each of their respective agents, representatives, officers, directors, shareholders, and employees from and against any injuries, losses, damages, claims, actions and any liability of any kind resulting from or arising out of your participation in or association with the Competition. Competition Sponsor is not responsible for any miscommunications such as technical failures related to computer, telephone, cable, and unavailable network or server connections, related technical failures, or other failures related to hardware, software or virus, or incomplete, late or misdirected Submissions. Competition Sponsor reserves the right to cancel, modify or suspend the Competition should any computer virus, bug or other technical difficulty or other causes beyond the control of Competition Sponsor corrupt the administration, security or proper play of the Competition, and to determine winners from among Submission not affected by the corruption, if any, in its sole discretion.

Neither Kaggle nor Competition Sponsor are responsible for (a) late, lost, stolen, damaged, garbled, incomplete, incorrect or misdirected Entries or other communications, (b) errors, omissions, interruptions, deletions, defects, or delays in operations or transmission of information, in each case whether arising by way of technical or other failures or malfunctions of computer hardware, software, communications devices, or transmission lines, or (c) data corruption, theft, destruction, unauthorized access to or alteration of Submission materials, loss or otherwise. Neither Kaggle nor Competition Sponsor are responsible for electronic communications or emails which are undeliverable as a result of any form of active or passive filtering of any kind, or insufficient space in any email account to receive email messages. Competition Sponsor disclaims any liability for damage to any computer system resulting from participation in, or accessing or downloading information in connection with, the Competition.

#### RESERVATION OF RIGHTS

Competition Sponsor reserves the right to modify the Start Date, End Date, and the right to modify, add or remove additional Competition deadlines for any reason. Any changes will be communicated through the Competition Website. Competition Sponsor also reserves the right to modify, remove or add Data to the Website upon notice via the Competition Website. NEITHER KAGGLE NOR COMPETITION SPONSOR ARE RESPONSIBLE FOR ANY FAILURE OF A PARTICIPANT TO RECEIVE DATA CHANGES.

### MISCELLANEOUS

#### SEVERABILITY

The invalidity or unenforceability of any provision of these Competition Rules shall not affect the validity or enforceability of any other provision. In the event that any provision is determined to be invalid or otherwise unenforceable or illegal, these Competition Rules shall otherwise remain in effect and be construed in accordance with their terms as if the invalid or illegal provision was not contained herein.

#### LAW

You agree that these terms and the relationship between you and Competition Sponsor shall be governed by the laws of the State of California and the United States of America.

## Rules Acceptance

You accepted these rules at 11:58 pm, Monday 1 June 2015 UTC.