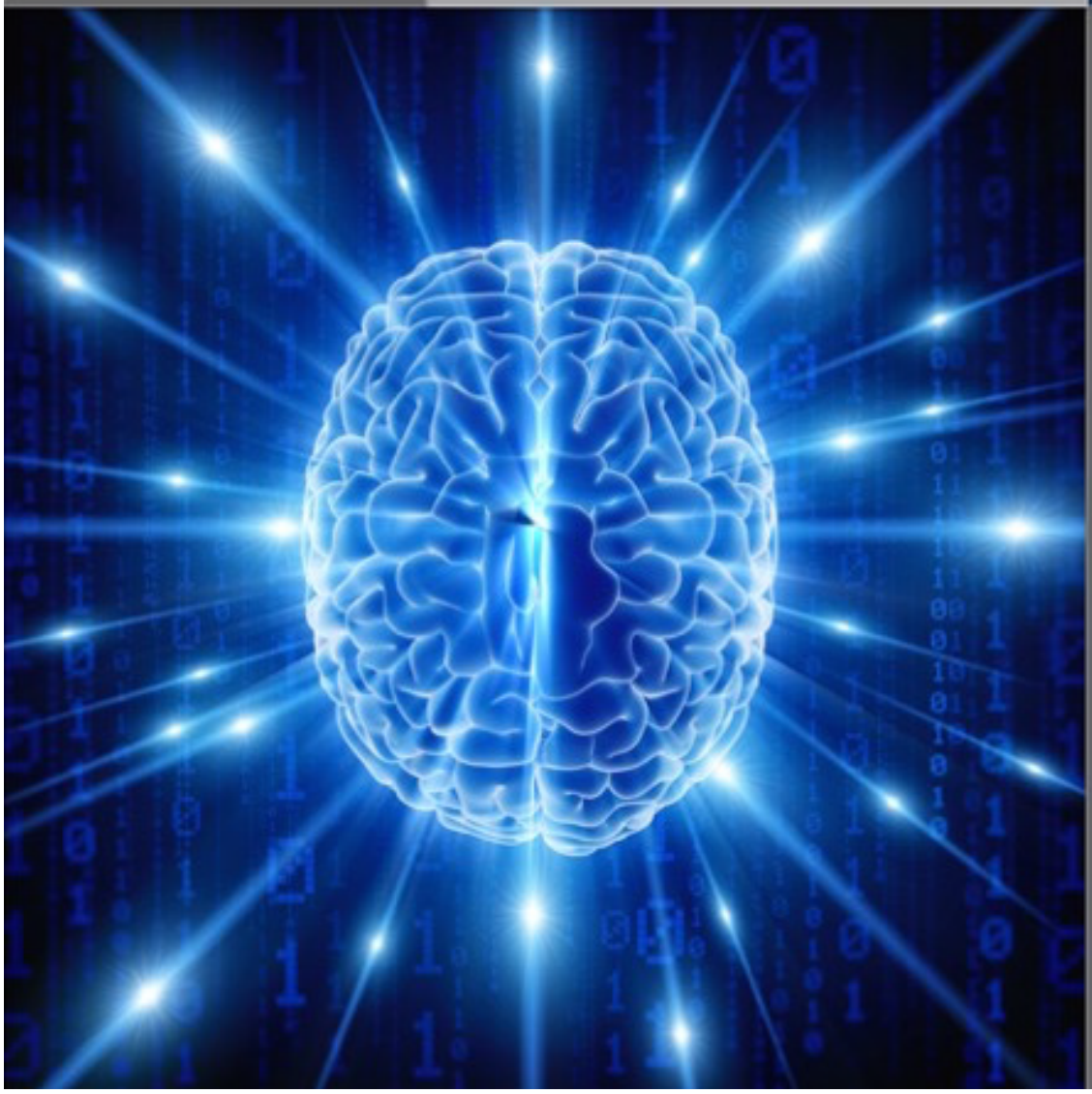
XPRIZE



IBM WATSON AI XPRIZE

ARTIFICIAL INTELLIGENCE XPRIZE COMPETITION GUIDELINES

Version 2.2
July 6, 2017

THE IBM WATSON AI XPRIZE IS GOVERNED BY THESE COMPETITION GUIDELINES. PLEASE SEND QUESTIONS TO ai@xprize.org AND JOIN THE CONVERSATION ON OUR FORUM AT http://forum.xprize.org/c/ibm-watson-ai-xprize.

THE XPRIZE FOUNDATION MAY REVISE THESE GUIDELINES DURING THE COURSE OF THE COMPETITION TO PROVIDE ADDITIONAL INFORMATION OR TO IMPROVE THE QUALITY OF THE COMPETITION. THERE MAY ALSO BE UNANTICIPATED ISSUES THAT WILL REQUIRE MODIFICATIONS TO THIS DOCUMENT. THE XPRIZE FOUNDATION RESERVES THE RIGHT TO REVISE THESE GUIDELINES AS IT, IN ITS SOLE DISCRETION, DEEMS NECESSARY OR DESIRABLE. REGISTERED TEAMS WILL BE NOTIFIED OF ANY REVISIONS.

Competition Guidelines

These Competition Guidelines describe the high-level requirements and implementation plan of the global and open Artificial Intelligence challenge, the IBM Watson Artificial Intelligence XPRIZE. XPRIZE will publish further specifications and implementation details as Rules & Regulations from time to time as necessary during the course of the competition.

Competition Overview

The purpose of this XPRIZE is to incentivize innovative approaches and solutions to addressing humanity's grand challenges with Artificial Intelligence (AI) and through AI-human collaboration. An Eligible Entry must be a solution that is originally developed and implemented by the Team. It can be based on existing product or research, or it can be a novel project. It must not violate any applicable law or regulation or infringe any third-party rights. Eligible Entries must demonstrate a compelling application of AI to create a novel outcome, demonstration, or solution to a meaningful challenge through augmentation of human expertise.

Artificial Intelligence

AI is a very broad field, encompassing a wide range of disciplines. Entries in the competition may draw upon several of these disciplines to synthesize a collaborative approach to addressing a grand challenge. While the complete embodiment of a Team's Entry may include many non-AI technologies, an Entry must substantially rely on the innovative use of technologies within the AI field. AI technologies address the mechanisms underlying thought and intelligent behavior, integrating sensory inputs and actions with cognitive capabilities. These are systems that possess domain understanding, learn from experience, reason towards specific goals, and interact naturally with human collaborators. True AI-human collaborations will augment and scale human and organizational intelligence through deep symbiotic relationships with individuals or Teams, applying their expertise to a wide range of tasks.

Teams will be responsible for clearly documenting and demonstrating the AI disciplines and dynamic settings they propose to use in their Entries. Complete Competition Plans will be submitted to the Judging Panel, and the Judging Panel has full discretion in deciding whether a Team's Competition Plan is complete and meets the requirements of the competition. Entries that do not demonstrably use AI technologies with clear evidence of understanding data, learning from experience, reasoning toward specific goals, and showing potential interactions with humans in a natural way to augment human capabilities will not be accepted into the competition.

Grand Challenges

Teams are equally encouraged to be innovative in their choice of the grand challenge to which they will apply their AI Solutions. A grand challenge is one of the most significant problems that humanity currently faces. If it is not addressed, there are significant negative consequences for humanity including loss of life, reduction in health, lack of access, lack of well-being, lack of education, environmental degradation, and inequality. Consequently, addressing, or even solving, a grand challenge should have the potential to improve the lives of millions of people or other living beings. While Teams may not directly address a grand challenge, they are highly encouraged to solve meaningful problems that would contribute to address a grand challenge.

COMPETITION STRUCTURE

This XPRIZE competition will set an open challenge in AI. Rather than set a single, universal goal for all Teams, this competition will invite Teams to each create their own goal: an application of AI to a grand challenge. Teams will then use their best available resources, along with the expert-sourced efforts of the professional AI and Engineering community, to develop a comprehensive Competition Plan. Each Team will have to demonstrate progress toward and achievement of that Plan over the course of a three-year competition culminating in a Grand Prize Competition on the TED 2020 stage in front of a live in-person/online audience. A panel of expert Judges and the audience will crown a Grand Prize Winner and determine the rank of the runners up from the three finalists.

REGISTRATION

Teams must register by January 19, 2017. Registration will include:

1. Payment of a $1,500 registration fee. Teams registering by November 15, 2016 are eligible for an Early Bird Discount of $500.

2. Submission of a fully-completed Competitor Agreement (with XPRIZE); and

3. Submission of a fully-completed Competition Application.

   The Competition Applications will include a description of:

   a. A Problem statement and the impact opportunity the Team intends to address.

   b. A Solution statement including milestones to be achieved, along with an explanation of the fundamental AI technology areas to be used and developed by the Team,

   c. An Evaluation proposal on how Judges should evaluate/assess their milestones and the performance of their AI

4. Team description and roles, along with needed expertise – to match with external experts. Note that Teams can augment over time and there is no expectation that the Team be complete to register for the competition.

5. IBM employees and their families are not eligible to participate as Teams or Team Members.

COMPETITION PLAN

After completing the Competition Application and registering, Teams will have until March 1, 2017 to develop a detailed Competition Plan. The Plan will include in depth explanation of the Competition Application, along with a more extensive project design, and will include a description of the technologies to be used/developed and the test strategies for evaluating those technologies. Competition Plans must result in deployed applications with measurable benefits that include some aspect of AI technology. The Competition Plan may include either a stand-alone application or a component of a complex system, or a collaboration among multiple applications.

The Competition Plan should be clearly articulated in regards to:

- The scope of the problem to be solved and its applicability on one or more domains
- The originality of the solutions and their applicability in real cases, and an overview of the Team's current technology and development strategy
- Scalability/performance assessment of the solution
- The test methods used to evaluate the solution, testing scenarios, and the data sets needed or available
- The metrics to measure the performance of the solution. Metrics should not use a comparison to human performance, but rather be on an absolute scale
- Impact that their solution may have on their chosen grand challenge, and more generally on AI-Human collaboration and expertise

EXPERT-SOURCED REVIEWERS

Team will provide a shareable Competition Application summary to be posted publicly by XPRIZE. XPRIZE, Teams, and partners will solicit expert reviewers from the professional AI, engineering, and target domain community to discuss the Competition Applications in detail with the Teams and XPRIZE. This community of reviewers will be a resource to Teams as they develop their application into a complete Competition Plan, and Teams will benefit from the world's expertise both in AI and in the disciplines pertinent to their grand challenge.

After this phase of review and upon completion and submission of Competition Plans, XPRIZE Judges and operations personnel will have the opportunity to request additional information from Teams. As a part of this process XPRIZE Judges may mandate additional or alternative dynamic demonstrations.

COMPETITION PLAN CONTENTS

Each Team's Competition Plan will provide its roadmap and criteria for the competition, and Teams will be measured by the standards they themselves set with the help of their reviewers and the community of experts.

Each Competition Plan must include the following components:

1-Problem Statement (Challenge)– Each Team will describe the opportunity and context for the problem they are solving. Using AI to address the scope of the problem defines a specific approach, and Teams are encouraged to clearly articulate how solving specific problems with AI is timely and important. The Plan should explain how addressing the problem may have applicable impact in other domains.

2-Proposed Solution – Each Plan will include a detailed explanation of the approach the Team will use to achieve its proposed goal. Teams may include explanations of technological approaches and development pathways. Solutions that achieve an exponential impact or shift or scalability will be weighted more highly than those that result in linear increases.

3-AI Technologies – Plans must include a detailed explanation of the Team's approach to Artificial Intelligence. What functions does the technology perform? What kind of technology is being employed? How will the Team itself validate and test its technology as well as evaluate success? Teams should describe related problems that can be solved by the same basic technical approach. Teams are encouraged to provide an overall "metadata" of their approach so that Judges may appreciate the training time requirements and transference of capabilities to related tasks.

4-Evaluation Goals / Test Suites– Each Team will describe how Judges should evaluate/assess their milestones and the performance of their AI. Teams must propose their own system for testing and assessing the quality of their AI technologies and advancements based on fundamental limits, and should not compare them to human performance.

5-Annual Progress Plan – Competition Plans must include the Team's proposed progress plan, showing their expected annual progress toward their goal. Progress against this plan will be reflected in each Team's annual progress report.

6-Grand Challenge Impact Goal – Based on the grand challenge domain that Teams have selected, they are encouraged to articulate the goal and the impact that their AI solution will have. The goal will be evaluated by the Judging Committee to ascertain its importance/benefit to humanity and the potential of an AI solution to meaningfully address the grand challenge.

7-AI-Human Collaboration – Teams must explain how their proposed AI tool works with humans to achieve the desired results and address the grand challenge.

USE OF TECHNOLOGIES

This is an open competition that encourages innovation in any form and doesn't preclude any approach or solution compliant with these Guidelines. IBM will make its Watson technology available free of charge for non-commercial purposes to registered Teams. The use of IBM Watson is not, however, required for this competition. Teams should build the best solutions they can; the use of IBM Watson technologies is not a scoring criterion and will not be an advantage or disadvantage to Teams.

TEST SUITES

Since each Team will be developing a unique solution, Teams are required to propose test environments to challenge and demonstrate the advancement of their Artificial Intelligence. Such test environments will be made public by XPRIZE as part of the contribution of the prize participants to the general community of AI and to allow independent verification of each Team's results.

Test suites are intended to accomplish two goals. The first is to allow Judges to determine the deep capabilities of Entries by examining the tests themselves. Since the entries will not be required to expose their code or detailed designs, Judges will need a way to independently evaluate the claimed capabilities of an Entry. The second goal is to encourage competition on proposed challenges by providing a definitive test suite for measuring achievements against those challenges. By providing open source implementations of test suites, entries show both seriousness in their attempt to address a grand challenge as well as general interest in promoting the progress of the AI community at large. As such, this competition goal is to enable and create a semantic network among submitted test suites, so as to understand the landscape of AI problems and characterize similarities. Motivating such long term collaboration is also a significant goal of this XPRIZE.

Test suites must be submitted to the AI XPRIZE repository on GitHub. Sufficient documentation must be provided to allow independent developers to install and execute the tests on suitable hardware. Tests will consist of a specified test environment which may include data sources, a set of example challenge tasks such as questions, goals, or activities, and at least one example of the results of a successful test and a failed test. Ideally, the test suite will also provide a score for the results of each task.

For example, if an Entry selected a challenge that related to complex dialog understanding, a test suite might provide a number of statements in random order of complex dialogs along with challenge questions concerning the likely order of the statements, the number and identities of participants, and evaluations of the roles, moods and likely next actions of the participants. A high-quality test suite for this Entry would be able to generate any number of such dialog challenges, probably from patterns learned over a large corpus of examples, and score the results automatically. The ability of such an Entry system to understand highly complex dialogs involving many participants across many interactions over an extended period of time would be an amazing and highly valuable accomplishment in AI. The OpenAI Gym (https://gym.openai.com), the General Game Playing framework (http://ggp.org), and the Arcade Learning Environment (http://arcadelearningenvironment.org) are excellent examples of such generalizable, extensible test environments.

It is understood that some Teams' challenges may not easily lend themselves to the use of automated test suites, and the Judges may make exceptions for this requirement in rare cases. But it is expected that even in challenges involving physically embodied systems such as robots, the developers will likely be using software simulation environments that could be readily adapted and submitted as test suites.

ACCEPTANCE

The Judging Panel will review all Competition Plans and decide which to accept into the competition. Acceptance will be based on the completeness of the Competition Plan, the audaciousness and utility of the proposed solution, and the comprehensiveness of the proposed evaluation plan and test suite. Acceptances will be announced on April 1, 2017, and Teams whose Competition Plans are accepted may proceed in the competition.

FOUR COMPETITION ROUNDS

The competition will take place over the course of four (4) rounds, the last of which will be held at the TED 2020 conference. Each round will take place within a calendar year, beginning with a comprehensive progress report and testing results submitted by the Team on September 1.

Rounds 1, 2, and 3

Each Round follows a similar schedule:

- **Development Phase** – Teams will work on developing/refining their technologies.

- **Progress Report** – Each September 1, Teams will submit comprehensive Progress Reports that show their accomplishments to date. The Judges will use this information to determine which Teams may continue in the competition at the end of the Round. The Judges may discuss the reports with each Team and ask for additional information. Progress Reports must include a complete description of the Team's progress, Test Suite reports, and a demonstration of the Team's current technology. The Progress Report may also include any updates to the Team's original project plan, including changes to the following year's goals.

- **Team Elimination** and Winner selection– At the end of Round 1 on January 15, 2018, and at the end of Round 2 on January 15, 2019, the Judges will announce which Teams have been eliminated from the competition. At the end of Round 1, 50% of Teams will be eliminated from the competition. If there are more than 200 active Teams admitted into the Round, more than 50% will be eliminated, leaving a maximum of 100 continuing Teams. At the end of Round 2, 50% of Teams will be eliminated from the competition. In Round 3, the Judging Panel will select 10 Semifinalists to compete in public in October 2019. Following a last round of review, the three Finalists will be chosen on January 15, 2020 to compete in Round 4 at TED 2020.

Round 4

In 2020 TED will host an audience-facing Grand Prize Competition that will feature the 3 finalists and determine the Grand Prize Winner and Runners Up (2nd and 3rd places).

Grand Prize Competition – Teams will demonstrate their AI advancements from the TED stage. The Judges, along with the live and online audiences will vote by ranking the Teams in order to determine the Grand Prize Winner and final standing of the remaining two Teams. The results, including purse disbursements, will be announced live from the TED stage.

Judging and Scoring

Rounds 1-3

In the first three rounds, the Judges will evaluate each Team's Progress Report and compare it to their Competition Plan. Judges will look for substantive progress on that Plan and continued innovation. Judges may discuss the reports with Teams, the Advisory Board, or outside experts. All Progress Reports must include complete automated testing results in accordance with the Team's Test Plan. In Round 3, the Judges will also evaluate the Semifinalists' performance in public demonstrations in Fall 2019.

Round 4

In Round 4, the 3 Finalist Teams will demonstrate their Entries on the TED stage before a live and online audience. The Judges will select the Grand Prize, Second Place and Third Place winners based on previous assessments and the results of both live audience and online audience voting.

The guidelines for scoring criteria will be established and finalized by the Judging Panel prior to the TED Grand Prize competition.

WILD CARD ENTRIES

As AI is such a rapidly advancing field, substantial innovations are likely to occur during the course of the competition. Two Wild Card rounds will permit new Teams with groundbreaking ideas to enter the competition. Wild Card Teams will go through the same registration, expert-sourced review, and application process as original entrants on a calendar that begins in 2017 or 2018. Unlike original entrants, however, it is expected that very few – if any – Wild Card Teams will be accepted. They must not only show a complete Competition Plan but also show that their Plan incorporates radical new advances that were not available at the start of the competition.

Registration for the first Wild Card Round will open on September 1, 2017 and close on December 20, 2017. Completed Competition Plans are due on March 1, 2018 and acceptances will be announced on April 1, 2018. The registration fee for the first Wild Card Round is $3,000. Accepted Wild Card Teams will submit their progress reports on September 1, 2018 along with continuing Teams. At the completion of the Round on January 15, 2019 the Teams eliminated from competition may include continuing and Wild Card Teams.

Registration for the second Wild Card Round will open on September 1, 2018 and close on December 20, 2018. Completed Competition Plans are due on March 1, 2019 and acceptances will be announced on April 1, 2019. The registration fee for the second Wild Card Round is $5,000. Accepted Wild Card Teams will submit their progress reports on September 1, 2019 along with continuing Teams. In September 2019, Wild Card Teams may be invited to participate among the 10 Semifinalists in public demonstrations in Fall 2019 along with continuing Teams. All Teams not selected as Semifinalists are eliminated from competition.

Note: Any Team, including Teams previously eliminated from the competition, may register for either or both Wild Card Rounds.

MILESTONE PRIZES

To recognize innovation and Team innovations, separate Milestone Prizes will be awarded in 2017 and 2018. Any Team interested in competing for that year's Milestone Prizes will submit a Milestone Application by September 1 describing its proposed demonstration. Each Team's demonstration should reflect some aspect of its Competition Plan, but does not have to demonstrate progress toward its overall goal. For example, Teams may wish to demonstrate component technologies or applications in related fields. In October the Judging Panel will announce up to 10 Teams selected to publicly demonstrate their work. A 1st and 2nd place Milestone Award will be given by the Judging Panel to the best of those demonstrations. Participation in the Milestone Prize competitions is entirely optional and has no effect on a Team's scoring in the main competition.

Prize Purses

Grand Prizes

Grand Prize ($3 million), 2nd Place ($1 million), and 3rd Place ($500,000) purses will be awarded at the end of competition Round 4 at TED 2020, for a total of $4.5 million.

Milestone and Special Prizes

Two Milestone Competition prize purses will be awarded each year in 2017 and 2018, and the Judges may award additional Special Prizes to recognize special accomplishments. A total of $500,000 is available for these prizes and will be allocated by the Judges at their sole discretion.

All prize purses are denominated and will be awarded in United States dollars (USD).

OVERALL COMPETITION TIMELINE

The IBM Watson AI XPRIZE competition will take place over the course of four (4) rounds. Table 3 outlines the different competition activities and timeline for the competition.

Date	Entries	Wild Cards	Milestone Competition
June 2016	Release of Competition Guidelines, registration opens		
November 15 2016	Deadline for discounted ($1,000) Early Bird registration		
January 19 2017	Registration closes		
ROUND 1			
March 1 2017	Teams submit complete Competition Plans		
April 1 2017	Judges announce accepted Teams		
September 1 2017		Wild Card Round 1 registration opens	Milestone Competition 1 applications due
September 1 2017	Progress reports due for first judging round		
October 2017			Judges announce 10 Teams invited to the public demonstration and Milestone Competition 1
December 20, 2017		Wild Card Round 1 registration closes	
December 2017			Milestone Competition 1
January 15 2018	Teams continuing to Round 2 are announced		
ROUND 2			
March 1 2018		Wild Card Round 1 Competition Plans due	

April 1 2018		Judges announce accepted Wild Card Round 1 Teams	
September 1 2018		Wild Card Round 2 registration opens	
September 1 2018			Milestone Competition 2 applications due
September 1 2018	Progress reports due for second judging round		
October 2018			Judges announce 10 Teams invited to the public demonstration and Milestone Competition 2
December 20, 2018		Wild Card Round 2 registration closes	
December 2018			Milestone Competition 2
January 15 2019	Teams continuing to Round 3 are announced		
ROUND 3			
March 1 2019		Wild Card Round 2 Competition Plans due	
April 1 2019		Judges announce accepted Wild Card Round 2 Teams	
September 1 2019	Progress reports due for third judging round		
September 2019	Judges announce 10 Semifinalists		
October 2019	Semifinalist Demonstration		
January 15 2020	Judges announce their selection of 3 Finalist Teams to compete at TED 2020.		
ROUND 4: GRAND PRIZE COMPETITION			
April 2020	Grand Prize Competition at TED 2020		

	Grand, 2nd Place, and 3rd Place Prizes awarded		

Selection of Advisors

XPRIZE will form panels of relevant Advisors to serve on Advisory Boards for the Competition. These Boards will remain in place throughout the Competition to advise XPRIZE regarding all aspects of the design and implementation of the Competition. Each Advisor will enter into an Agreement with XPRIZE that will: (i) outline Advisor's duties and obligations; (ii) require Advisor to maintain confidentiality of XPRIZE's and Teams' Confidential Information, in accordance with the Agreement; and (iii) require Advisor to acknowledge that he or she shall make no claim to any Team's Intellectual Property.

These panels will be independent of XPRIZE and all Teams and Team Members. No Advisor, nor any member of Advisor's immediate family, shall participate, nor have any financial or other material interest, in any Team or Team Member. All Advisors shall promptly disclose to XPRIZE any such current, former, or expected future conflict of interest with XPRIZE, the Title Donor, and/or any Team or Team Member.

Scientific Advisory Board

The duties and responsibilities of the Scientific Advisory Board may include, but not be limited to: (i) assisting with the establishment of qualifications for prospective Judges; (ii) recommending members of the Judging Panel; (iii) providing input related to testing protocols and judging criteria, including the standard technical specifications and economic values; (iv) and providing input toward the development of these Competition Guidelines.

Judging Panel

The Judging Panel (as defined in the Agreement) will be comprised of highly qualified and impartial Judges. XPRIZE, in its sole and absolute discretion, will recommend Judging Panel candidates to the Advisory Board for its review and consideration. The Advisory Board will recommend the candidates it believes are best suited to serve on the Judging Panel. Judges will be subject to the same standards of impartiality and confidentiality applied to Advisors.

Role of Judging Panel

The duties and responsibilities of the Judging Panel will include, but not be limited to: (i) evaluating Teams' compliance with the Agreement, these Guidelines, and the Rules and Regulations for the purposes of the Competition; and (ii) the awarding of points and selection of Teams and Entries that will proceed to each subsequent phase of the Competition.

Grounds for Judging Panel Decisions

Official decisions made by the Judging Panel will be approved by a majority of the Judges that vote on each decision after careful consideration of the testing protocols, procedures, rules, regulations, criteria, results, and scores set forth in the Agreement, these Competition Guidelines (including the Rules and Regulations to be attached hereto), and all other applicable Exhibits to the Agreement. If any vote of the Judges results in a tie, then the Judging Panel shall determine, in its sole and absolute discretion, the mechanism to settle the tie. Similarly, if one or more Teams or Entries are tied at any stage during the competition, the Judging Panel shall have the sole and absolute discretion to settle the tie. If no Entry meets the criteria for an Award, then the Judging Panel will retain sole and absolute discretion to declare or not declare a winner of the Competition and/or otherwise allocate or choose not to allocate one or more of the Awards and/or any other Award associated with the Competition.

Decisions of Judging Panel Are Final

The Judging Panel shall have sole and absolute discretion: (i) to allocate duties among the Judges; (ii) to determine the degree of accuracy and error rate that is acceptable to the Judging Panel for all Competition calculations, measurements, and results, where not specified in the Rules and Regulations; (iii) to determine the methodology used by the Judging Panel to render its decisions; (iv) to declare the winners of the Competition; and (v) to award the Prize Purses and other Awards. Decisions of the Judging Panel shall be binding on XPRIZE, the Team, and each Team Member. XPRIZE and the Team agree not to dispute any decision or ruling of the Judging Panel, including decisions regarding the degree of accuracy or error rate of any Competition calculations, measurements, and results. The Team shall have no right to observe other Teams' testing or evaluation, or to be informed of other Teams' calculations, measurements, and results, unless such information is made publicly available by XPRIZE.