

### **MicroNet Competition Official Rules**

**NO PURCHASE NECESSARY TO ENTER. VOID WHERE PROHIBITED.** COMPETITION IS OPEN TO RESIDENTS OF THE 50 UNITED STATES, THE DISTRICT OF COLUMBIA AND WORLDWIDE, EXCEPT FOR CRIMEA, CUBA, IRAN, SYRIA, NORTH KOREA, and SUDAN (Current list of countries under export sanctions). RESIDENTS OF ITALY, BRAZIL and QUEBEC may participate but are not eligible to receive Cloud Credits.

### **ENTRY IN THIS COMPETITION CONSTITUTES YOUR ACCEPTANCE OF THESE OFFICIAL RULES.**

The **MicroNet Competition** (the "Competition") is an activity in which participants must develop a model capable of solving ImageNet to 75% top-1 accuracy, WikiText-103 to a perplexity of 35, and CIFAR-100 to 80% top-1 accuracy as provided in the Competition description and at the Competition Site, available at <https://micronet-challenge.github.io/>. The model that you develop will be evaluated by judges, who will choose the winner(s) in accordance with these Official Rules. Cloud credits will be awarded to the first 25 participant(s) to register for the Competition in accordance with these Official Rules. See below for the complete details.

**1. BINDING AGREEMENT:** In order to enter the Competition, you must agree to these Official Rules ("Rules"). Therefore, please read these Rules prior to entry to ensure you understand and agree. You agree that submission of an entry in the Competition constitutes agreement to these Rules. You may not submit an entry to the Competition and are not eligible to receive the incentives described in these Rules unless you agree to these Rules. These Rules form a binding legal agreement between you and Google with respect to the Competition.

**2. ELIGIBILITY:** To be eligible to enter the Competition, you must be: (1) above the age of majority in the country, state, province or jurisdiction of residence (or at least twenty years old in Taiwan) at the time of entry; (2) not a resident of Crimea, Cuba, Iran, Syria, North Korea, or Sudan; (3) not a person or entity under U.S. export controls or sanctions; and (4) have access to the Internet as of **June 1, 2019**. Competition is void in Crimea, Cuba, Iran, Syria, North Korea, Sudan, and where prohibited by law. Employees, interns, contractors, and official office-holders of Google, Deepmind, OpenAI and Facebook and their parent companies, subsidiaries, affiliates, and their respective directors, officers, employees, advertising and promotion agencies, representatives, and agents ("Competition Entities"), and members of the Competition Entities' and their immediate families (parents, siblings, children, spouses, and life partners of each, regardless of where they live) and members of the households (whether related or not) of such employees, officers and directors are eligible to participate in this Competition, but are not eligible to receive Cloud Credits in connection with the Competition. Sponsor reserves the right to verify eligibility and to adjudicate on any dispute at any time.

If you are entering as part of a company or on behalf of your employer, these rules are binding on you, individually, and/or your employer. If you are acting within the scope of your employment, as an employee, contractor, or agent of another party, you warrant that such party has full knowledge of your actions and has consented thereto, including your potential receipt of an incentive. You further warrant that your actions do not violate your employer's or company's policies and procedures.

**3. SPONSOR:** The Competition is sponsored by Google LLC ("Google" or "Sponsor"), a Delaware corporation with principal place of business at 1600 Amphitheater Parkway, Mountain View, CA, 94043, USA.

**4. COMPETITION PERIOD:** The Competition begins at 12:00:00 A.M. Pacific Time (PT) Zone in the United States on June 1, 2019 and ends at 11:59:59 P.M. PT on September 30, 2019 ("Competition Period"). *ENTRANTS ARE RESPONSIBLE FOR DETERMINING THE CORRESPONDING TIME ZONE IN THEIR RESPECTIVE JURISDICTIONS.*

**5. HOW TO ENTER:** NO PURCHASE NECESSARY TO ENTER OR WIN. To enter the Competition, visit the Competition website located at <https://micronet-challenge.github.io/> ("Competition Site") during the Competition Period and follow the

instructions for developing a model capable of solving ImageNet to 75% top-1 accuracy, WikiText-103 to a perplexity of 35, and CIFAR-100 to 80% top-1 accuracy as provided in the Competition description ("Code"). The Code must reproduce the results stated in the contestant's entry (hereinafter, "Requirements"). Written parts of entries must be in English to be eligible. The Code must, at a minimum, must support English language use.

LIMIT THREE (3) ENTRIES PER PERSON OR GROUP PER MODEL. Subsequent entries will be disqualified. All entries must be received by 11:59 p.m. (PT) on September 30, 2019. Entries are void if they are in whole or part illegible, incomplete, damaged, altered, counterfeit, obtained through fraud, or late. All entries will be deemed made by the authorized account holder of the email address submitted at the time of entry, and the potential winners may be required to show proof of being the authorized account holder for that email address. The "authorized account holder" is the natural person assigned to an email address by an Internet service provider, online service provider, or other organization responsible for assigning email address for the domain.

During the Competition Period, the Sponsor, its agents and/or the Judges (defined below) will be evaluating each Code to ensure that it meets the Requirements. The Sponsor reserves the right, in its sole discretion, to disqualify any entrant who submits a Code that does not meet the Requirements.

**6. JUDGING:** Each entry will be judged by a panel of experts who are employees of Sponsor, Deepmind, Facebook and OpenAI ("Judges"). On or about October 2019, each Code will be evaluated by the Judges based on the following criteria:

a. Parameter Storage: The number of parameters that are required to perform inference. In addition to trainable parameters, any values that are needed to perform inference should be counted (e.g., indices for sparse matrix formats). Entries are allowed to assume that their models are quantized to 16-bits at no accuracy penalty. That is to say, entrants can calculate parameter storage for their models as if it were quantized to 16-bits without actually doing the quantization. A 16-bit parameter counts as one parameter. If quantization is performed, a parameter of less than 16-bits will be counted as a fraction of one parameter. For example, an 8-bit parameter counts as  $\frac{1}{2}$  a parameter towards the model's parameter storage requirements.

b. Math Operations: The mean number of arithmetic operations per example required to perform inference on the test set. Multiplies and additions count separately. Transcendental function evaluations and bitwise operations count as one op.

Entries are allowed to assume that their models are quantized to 16-bits at no accuracy penalty. That is to say, entrants can calculate math operations for their models as if it were quantized to 16-bits without actually doing the quantization. A 16-bit operation counts as one operation. If quantization is performed, an operation on data of less than 16-bits will be counted as a fraction of one operation, where the numerator is the maximum number of bits in the inputs of the operation and the denominator is 16. For example, a multiplication operation with one 3-bit and one 5-bit input, with a 7-bit output, will count as  $\frac{5}{16}$ th of an operation. A multiplication operation where one input is 16-bits, the other input is 8-bits and the output is 8-bits will count as one whole op, as the first input is 16-bits.

For WikiText-103, numbers can be calculated on the tokenized version of the test set, and will be averaged per-token. Numbers with WikiText-103 should be calculated with a batch size of 1 sequence, such that no padding is needed to handle variable sequence lengths. Numbers with WikiText-103 should also be calculated as if inference is performed on-line, i.e. tokens are fed sequentially to the model and it must predict the next token prior to receiving it. This is important for architectures that do not have any state (e.g., Transformer).

Ranking Entries

For ImageNet and CIFAR-100, parameter storage, and compute requirements will be normalized relative to [MobileNetV2](#) with width 1.4 (6.9M parameters, 1170M math operations). For example, an ImageNet submission that has 3 million parameters and 500 million math operations will have a final score of  $3M / 6.9M + 500M / 1170M = .862$ .

For WikiText-103, these metrics will be normalized relative to the LSTM model presented [here](#). This model uses a single-layer LSTM with 2048 hidden units, tied embedding and softmax parameters with dimension 512, and a weight tied linear projection to/from the embedding/softmax width of 512 to the LSTM width of 2048. In total, it has 172M parameters, and 345M math operations.

Judges will evaluate and attribute a score to each Code made up of scores based upon the above-listed criteria. The 3 entries that receive the highest overall scores will be selected as the potential winner(s). In the event of a tie, there will be more than 3 winners.

**7. INCENTIVES:** The first 25 participants to register to participate in the Competition will be eligible to receive Cloud Credits to assist in developing their submission. The receipt of Cloud Credits may be subject to restrictions and/or licenses and may require additional hardware, software, service, or maintenance to use. The recipient shall bear all responsibility for use of the Cloud Credits in compliance with any conditions imposed by such manufacturer(s), and any additional costs associated with its use, service, or maintenance.

**8. GENERAL CONDITIONS:** All federal, state, provincial and local laws and regulations apply. Google reserves the right to disqualify any entrant from the Competition if, in Google's sole discretion, it reasonably believes that the entrant has attempted to undermine the legitimate operation of the Competition by cheating, deception, or other unfair playing practices or annoys, abuses, threatens or harasses any other entrants, Google, or the Judges.

**9. INTELLECTUAL PROPERTY RIGHTS:** By submitting a Code in this Competition, the entrant warrants and represents that the Code, including the programming and related material, is open source and is released subject to the MIT License. and not subject to the proprietary rights of any person or entity.

**10. PRIVACY:** Participant acknowledges and agrees that Google may collect, store, share and otherwise use personally identifiable information provided during the registration process and the Competition, including, but not limited to, name, mailing address, phone number, and email address. Google will use this information in accordance with its Privacy Policy (<http://www.google.com/policies/privacy/>), including for administering the Competition and verifying Participant's identity, postal address and telephone number in the event an entry qualifies for an incentive.

Participant's information may also be transferred to countries outside the country of Participant's residence, including the United States. Such other countries may not have privacy laws and regulations similar to those of the country of Participant's residence.

Participant acknowledges and agrees that Participant's data may be shared with co-sponsor. The use of the data by co-sponsor is subject to co-sponsor's privacy policy.

If a participant does not provide the mandatory data required at registration, Google reserves the right to disqualify the entry.

Participant has the right to request access, review, rectification or deletion of any personal data held by Google in connection with the Competition by writing to Google at this email address [micronet.challenge@gmail.com](mailto:micronet.challenge@gmail.com).

**11. PUBLICITY.** By accepting participating in the Competition, entrant agrees to Sponsor and its agencies use of his or her name and/or likeness and Code for advertising and promotional purposes without additional compensation, unless prohibited by law.

**12. WARRANTY, INDEMNITY AND RELEASE:** Entrants warrant that their Codes are their own original work and, as such, they are the sole and exclusive owner and rights holder of the submitted Code and that they have the right to submit the Code in the Competition and grant all required licenses. Each entrant agrees not to submit any Code that (1) infringes any third party proprietary rights, intellectual property rights, industrial property rights, personal or moral rights or any other rights, including without limitation, copyright, trademark, patent, trade secret, privacy, publicity or confidentiality obligations; or (2) otherwise violates the applicable state or federal law.

To the maximum extent permitted by law, each entrant indemnifies and agrees to keep indemnified Competition Entities at all times from and against any liability, claims, demands, losses, damages, costs and expenses resulting from any act, default or omission of the entrant and/or a breach of any warranty set forth herein. To the maximum extent permitted by law, each entrant agrees to defend, indemnify and hold harmless the Competition Entities from and against any and all claims, actions, suits or proceedings, as well as any and all losses, liabilities, damages, costs and expenses (including reasonable attorneys fees) arising out of or accruing from (a) any Code or other material uploaded or otherwise provided by the entrant that infringes any copyright, trademark, trade secret, trade dress, patent or other intellectual property right of any person or defames any person or violates their rights of publicity or privacy, (b) any misrepresentation made by the entrant in connection with the Competition; (c) any non-compliance by the entrant with these Rules; (d) claims brought by persons or entities other than the parties to these Rules arising from or related to the entrant's involvement with the Competition; and (e) acceptance, possession, misuse or use of any incentive or participation in any Competition-related activity or participation in this Competition.

Entrant releases Google from any liability associated with: (a) any malfunction or other problem with the Competition Site; (b) any error in the collection, processing, or retention of entry information; or (c) any typographical or other error in the printing, offering or announcement of any incentives or winners.

**13. ELIMINATION:** Any false information provided within the context of the Competition by any entrant concerning identity, mailing address, telephone number, email address, ownership of right or non-compliance with these Rules or the like may result in the immediate elimination of the entrant from the Competition.

**14. INTERNET:** Competition Entities are not responsible for any malfunction of the entire Competition Site or any late, lost, damaged, misdirected, incomplete, illegible, undeliverable, or destroyed Codes or entry materials due to system errors, failed, incomplete or garbled computer or other telecommunication transmission malfunctions, hardware or software failures of any kind, lost or unavailable network connections, typographical or system/human errors and failures, technical malfunction(s) of any telephone network or lines, cable connections, satellite transmissions, servers or providers, or computer equipment, traffic congestion on the Internet or at the Competition Site, or any combination thereof, including other telecommunication, cable, digital or satellite malfunctions which may limit an entrant's ability to participate.

**15. RIGHT TO CANCEL, MODIFY OR DISQUALIFY.** If for any reason the Competition is not capable of running as planned, including infection by computer virus, bugs, tampering, unauthorized intervention, fraud, technical failures, or any other causes which corrupt or affect the administration, security, fairness, integrity, or proper conduct of the Competition, Google reserves the right at its sole discretion to cancel, terminate, modify or suspend the Competition. Google further reserves the right to disqualify any entrant who tampers with the submission process or any other part of the Competition or Competition Site. Any attempt by an entrant to deliberately damage any web site, including the Competition Site, or undermine the legitimate operation of the

Competition is a violation of criminal and civil laws and should such an attempt be made, Google reserves the right to seek damages from any such entrant to the fullest extent of the applicable law.

**16. NOT AN OFFER OR CONTRACT OF EMPLOYMENT:** Under no circumstances shall the submission of Code into the Competition, the awarding of an incentive, or anything in these Rules be construed as an offer or contract of employment with either Google, or the Competition Entities. You acknowledge that you have submitted your Code voluntarily and not in confidence or in trust. You acknowledge that no confidential, fiduciary, agency or other relationship or implied-in-fact contract now exists between you and Google or the Competition Entities and that no such relationship is established by your submission of Code under these Rules.

**17. FORUM AND RECOURSE TO JUDICIAL PROCEDURES:** These Rules shall be governed by, subject to, and construed in accordance with the laws of the State of California, United States of America, excluding all conflict of law rules. If any provision(s) of these Rules are held to be invalid or unenforceable, all remaining provisions hereof will remain in full force and effect. To the extent permitted by law, the rights to litigate, seek injunctive relief or make any other recourse to judicial or any other procedure in case of disputes or claims resulting from or in connection with this Competition are hereby excluded, and all Participants expressly waive any and all such rights.

**19. ARBITRATION:** By entering the Competition, you agree that exclusive jurisdiction for any dispute, claim, or demand related in any way to the Competition will be decided by binding arbitration. All disputes between you and Google of whatsoever kind or nature arising out of these Rules, shall be submitted to Judicial Arbitration and Mediation Services, Inc. ("JAMS") for binding arbitration under its rules then in effect in the San Jose, California, USA area, before one arbitrator to be mutually agreed upon by both parties. The parties agree to share equally in the arbitration costs incurred.