TIG Challenge Owners

The Innovation Game
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1. Introduction

A concept inspired by open source project maintainers, TIG (The Innovation Game) **Challenge Owners** play a crucial role in the search for algorithmic breakthroughs by crafting and servicing TIG challenges to drive innovation. Challenge Owners design and add challenges to the TIG framework in collaboration with TIG labs, updating the challenge as necessary to ensure innovation remains competitive with SOTA algorithms. The most successful Challenge Owners will have a deep understanding of the context the challenge is designed in. This document describes generally the following about Challenge Owners:

- **Incentives:** A portion of TIG token emissions are distributed amongst Challenge Owners as a reward. Successful algorithmic enhancements (where an innovator is earning Advance rewards) in their respective challenges result in greater Challenge Owners rewards to incentivize high-quality challenge design. We will be using terms defined formally in this[1] document regarding Advance Rewards eligibility (namely the term Advance to describe a algorithm which is eligible for Advance Rewards). See 2 below.
- **Responsibilities:** Responsibilities of Challenge Owners are designed to maximize the probability of a successful Advance in their Challenge. All responsibilities aim to ensure that innovation stays maximally useful for real-world applications, in line with TIG's goals. See 3 below.
- **Benefits for TIG:** Challenge Owners hold expert knowledge and networks that complement that of TIG labs, enhancing the quality of challenges and rate at which new challenges are added. Challenge Owners also hold deeper networks in their fields, giving them a better understanding of SOTA algorithms TIG aims to improve upon. See 4 below.

2. Incentives

For each block, 20% of total token emissions [2] will be distributed amongst Challenge Owners as a reward. There will be static and a dynamic (performance related) component to Challenge Owner rewards.

- **Static Reward.** For each block, 10% of the the total token emissions will be distributed evenly amongst all Challenge Owners.
- **Performance Related Reward.** In each block, a further 10% of the total token emissions will be distributed pro-rata to Challenge Owners based on the number of Recent Advances. A Recent Advance for a challenge is a algorithm which has passed the Advance Rewards vote in the past 15 weeks. If there are no Recent Advances in any challenges, then this reward is evenly distributed to all Challenge Owners.

[1] https://jmp.sh/SnIbvZz1
[2] Similar to rewards of subnet owners in TAO (bittensor) `https://bittensor.com/content/subnets-dive`

Worked example.
Assume three Challenge Owners—Sally, Bob, and Alan. Within the current 15-week window Sally's challenge has had **2** advances, Bob's **1** advance, and Alan's **0** advances. According to the reward mechanism they then receive

$$S = \frac{0.10R}{3} + 0.10R \times \frac{2}{3}, \quad B = \frac{0.10R}{3} + 0.10R \times \frac{1}{3}, \quad A = \frac{0.10R}{3} + 0.10R \times \frac{0}{3}$$

where R denotes the total tokens emitted in the block, and S, B, A denote the amount rewarded to Sally, Bob and Alan respectively.

Beyond financial incentives, Challenge Owners are encouraged to submit challenges that align with their own interests or have potential use cases beyond the TIG protocol. On top of developing algorithms for a problem they are passionate about, TIG offers Challenge Owners a way to crowdsource solutions of problems that matter to them.

3. Responsibilities

The role of Challenge Owners is to produce and update challenges to ensure the resulting innovations remain maximally useful for real-world applications and/or are competitive with SOTA algorithms. The responsibilities listed here give a guide to Challenge Owners on how to achieve their goal:

- **Challenge Design:** With support from TIG Labs, Challenge Owners use their expert understanding of the problem and industry knowledge to design the challenge. As part of this process, the synthetic instance generation should be implemented in code to allow for testing of parameter settings. Owners are expected to post a draft of the challenge design on the forum[3] to invite feedback and address any questions.
- **Maintain Challenge:** After a challenge is launched, Owners should update it as necessary to ensure that the innovation it drives stays maximally relevant for real-world applications.
- **Advance Rewards vote:** When algorithms are submitted for Advance Rewards eligibility, Owners should lead discussions with the community on the TIG forums.
- **Quarterly Algorithm Performance Reports:** Provide quarterly reports on how the best algorithms submitted perform against standard benchmarks[4] representative of real-world scenarios [5].
- **Engage their Network:** Leverage their network to encourage the participation of world-class researchers, either by inviting them to contribute as innovators or by involving them in discussions around the eligibility of the algorithm for advanced rewards.

4. Benefits for TIG

Challenge Owners offer substantial benefits to TIG. By working closely with TIG Labs, they enable the process of onboarding challenges to scale. This collaboration removes constraints on the frequency with which challenges can be introduced, enabling TIG to address a broader spectrum of computational problems with the potential for advanced innovations. Expert industry knowledge provides deeper insight into current state-of-the-art algorithms and standard benchmarks that provide useful quantitative results.

Challenge Owners also bring whole new networks of people who may benefit from engaging with TIG, enabling individuals who might not otherwise engage with TIG to contribute meaningfully to the protocol and help it grow. Academic and Industry experts, serving as innovators, play a crucial role in the development

[3]For example, see the forum post for the design of the Neural Network Training Challenge `https://forum.tig.foundation/t/upcoming-challenge-neural-network-gradient-descent/47`.

[4]TIG provides a prebuilt evaluator tool which automatically runs the algorithms on standard benchmarks.

[5]Example of report for the Quadratic Knapsack Problem: `https://tigstats.com/reports/q1-2025`

of sophisticated breakthrough Algorithms, and Challenge Owners encouraging academic experts to submit algorithms will accelerate the rate of algorithmic innovation significantly.

Challenge Owners will allow the protocol to scale to levels which would be impossible otherwise. They are poised to play an essential role in developing and scaling the TIG platform to accelerate algorithmic development by working on the core aspect of TIG - TIG challenges.