

Hitachi Hokudai Laboratory & Hokkaido University Programming Contest 2019-2 Special Prize: Instructions on submission of an idea summary to the special prize category

Dear Contestant, thank you very much for participating and submitting your codes to the Hitachi Hokudai Laboratory & Hokkaido University Programming Contest 2019-2 on combinatorial optimization in dynamically changing environments. While the contest itself has finished and further submissions are no longer possible, we would like to invite you to submit a summary illustrating your ideas and strategy for designing an algorithm which efficiently minimizes customer waiting times in uncertain, time-changing environments.

Eligibility:

- Participants eligible for participation in the special prize must rank 1-50 in the Hitachi Hokudai Laboratory & Hokkaido University Programming Contest 2019-2 as listed on the following webpage: <https://atcoder.jp/contests/hokudai-hitachi2019-2>

Submission Rules:

- A submission shall be no longer than 4 pages.
- A submission shall be submitted as a pdf document.
- Submissions shall contain the screen name of the submitter as listed in the top 50 ranks of the contest webpage. <https://atcoder.jp/contests/hokudai-hitachi2019-2>

Note: Submissions without screen name cannot be identified and will be invalid.

- Eligible candidates will be invited to make a submission by email. The same email will notify candidates of (i) an **email address** [tetsuro.tosaki.ys@hitachi.com] to send their submissions to and (ii) a **deadline** [January 28th 2020] by which to submit their submission

Note: Submissions send to a different email address or after the submission deadline will be invalid.

- Please refrain from making multiple submissions. If in doubt, we will evaluate your last submissions. Code summaries received after the indicated deadline will not be considered.

Prizes:

- We will award prizes to 5 submission. (one submission per category)
- Each prize-winning submission will receive 30'000 JPY. (150'000 JPY in total for 5 categories). Note: As it might be impossible to transfer money into international bank accounts from Japan, award winners from foreign countries will be given a prize of equivalent value, for example by using a gift voucher.

Purpose of the Special Prize and Guidelines for Preparing the Manuscript:

The purpose of this special prize category is for the contestant to illustrate and appeal to the organizers of the programming contest their ideas and strategies to efficiently handle temporal changes in the environment of the posed optimization problem. In that, note that this special prize category is different from the main contest. In particular, we are not so interested in receiving plane documentations of the contestant's code. Instead, what we would like to know is the following:

- (1) **Environmental changes:** Which of the environmental uncertainties of the programming contest did you think were most important to handle in order to receive a good score?
 - (a) Traffic jams
 - (b) Car breakdown
 - (c) Order Cancellation
 - (d) Traffic lights
 - (e) Other: _____

If possible, present an analysis which brought you to think in that way.

- (2) **Strategy:** Pick one or many environmental changes in (1) and describe your idea and strategy of handling the environmental change(s) efficiently? For example, did you find a way to pick particularly robust solutions of a static TSP solver to plan your route? Did you use an elegant way to anticipate critical environmental changes? Or was it important for your algorithm to adapt to environmental changes quickly? If possible, present the logic behind your strategy.

Note: It is not necessarily important to pick the environmental change which gave you the highest increase in score. Instead, pick the environmental change which you think your algorithm handles particularly elegantly.

- (3) **Algorithm and Strategy Implementation:** Please let us know how you designed your algorithm in order to implement the strategy mentioned in (2). To this end, please let us know:

- (a) **Baseline algorithm:** What was your baseline algorithm/strategy to deliver orders? For example, when did you go to the shop to collect orders? How did you plan your delivery route? In which order did you visit costumers on a route? Did you use a particular known algorithm, such as a TSP solver?
- (b) **Implementation of your strategy:** How was your strategy to handle the selected

environmental uncertainty implemented on top of the baseline algorithm?

(c) Please consider including a pseudo-code summary.

(4) **Benchmark:** Please consider illustrating the efficiency of your strategy by including a benchmark result. For example, show us the contest score or the customer waiting times, when using and not using your strategy to handle a particular environmental change.

Evaluation:

- Submissions will be evaluated by the organizers of the programming contest.
- We will consider all submitted idea summaries and evaluate them.
- Detailed evaluation of the submitted idea summaries cannot be pinned down in advance, as there is a variety of ideas which we cannot anticipate. Hence, think of our evaluation as a review process to a journal or a conference. In general, we will rate submissions highly, if they:
 - (a) clearly address the above requirements (1)-(4),
 - (b) if your idea seems convincing and well presented,
 - (c) if its implementation is well documented and understandable, and
 - (d) its efficiency is clearly presented, e.g., by using a benchmark.
- **Idea summary categories:** We are planning to separate your submissions into 5 categories and award a prize to the best idea summary for each category. The categories will be determined by the environmental uncertainty (1:a-e) you address as well as the chosen strategy (2). To account for unanticipated ideas, we will determine the precise categories after receiving your submissions.

Format:

● **Header: Mandatory!**

Screenname: Your Screenname

Submission date: XX.XX.2020

This submission describes a strategy/strategies to handle the following environmental change(s): _____

The described strategy is: _____

● **Body:**

(The body of a submission is a free format and the following is just a suggestion.)

1. I think that the following environmental changes XYZ must be addressed in order to receive satisfactory customer waiting times, because _____.
2. In my submission I will describe my idea to handle environmental change _____ which I will handle by strategy _____.
3. The general outline of my strategy is _____.
4. My strategy is implemented on top of a baseline delivery algorithm which works as follows: _____. (Please consider preparing a pseudo-code.)
5. I implement my strategy as follows _____.
(Please consider preparing a pseudo-code.)
6. The efficiency of my strategy is documented by the following benchmark _____.