

Hitachi Hokkaido University Laboratory and Hokkaido University to hold the Programming Contest 2021 focused on "Future Autonomous Distributed City Development"

Accelerating the research and development of regional energy system for local production and consumption to realize sustainable local communities through industry-academia collaboration

Hitachi Hokkaido University Laboratory (hereafter, Hitachi Hokudai Lab.) and Hokkaido University have announced the jointly organized Hitachi Hokudai Lab. & Hokkaido University Contest 2021.

In reaction to the COVID-19 Pandemic, teleworking from home has become widespread, and people's place of work no longer depends on their place of residence, so more people are considering living in areas with nature environments. In the future, more people are expected to migrate from Japan's densely populated large cities to its sparsely populated rural regions. In order to eliminate regional disparities in energy, maintain communities, and realize a safe and secure living environment for residents, it is important to provide a stable electric power supply, and provide a self-sustaining electric power system, which can be used even in the event of a widespread power blackout due to a disaster.

Aiming to achieve both a low-carbon society and revitalization of the local economy, Hitachi Hokudai Lab. and Hokkaido University are developing regional energy systems for local production and consumption in collaboration with Iwamizawa City. In this systems, new services that contribute to local industry and daily life, will be provided by introducing multiple small grids (hereafter, nanogrids) in the region. The nanogrids that utilize renewable energy will be scattered around the area and networked with electric vehicles (EVs) to build a movable grid in which energy supply and energy demand are integrated.

To achieve this system, the next-generation optimization technology (hierarchical multi-objective and spatio-temporal optimization technology) must be developed that provides the

optimal solutions to environmental problems and economic challenges in short-term and long-term operation and robustly adapts its solutions to sudden temporal changes that are difficult for the conventional optimization solvers to address such as fluctuations in climate and demand.

Hitachi Hokudai Lab. and Hokkaido University hold a marathon-type contest every year since 2017, formulating the actual problems including the fun of thinking about clear criteria and algorithms, to be solved by mathematical modeling and making them open problems in order to solve complicated social problems. By dealing with actual problems rather than simple benchmarks, participants all over the world can share social issues that we want to solve, sympathize with the value of the services we want to provide, and devise high-performance algorithms that lead to practical use through this contest.

In 2021's contest, we will prepare two problems (A and B) on the topic of optimal area design for a regional energy system.

Organizers

- Hitachi Hokudai Lab., Center for Exploratory Research, Hitachi, Ltd.
- Hokkaido University
- Kansai University (Cooperator)

Period for submission

November 13th 2021 – January 31st 2022 (Problems A and B*)

*Problem B starts on December 4th.

The 1st ranked winner of contests A and B will be awarded ¥300,000 and ¥500,000, respectively. We are also currently preparing special items and further prizes for top-ranked contestants. The contest's awards ceremony will be held online during the lunch seminar

session of the 84th IPSJ National Convention, at which the contest winners will be invited to present their algorithms.

- Date: March 4th, 2022 (Fri.) 11 : 30-12 : 30
- Venue: Ehime University and Online (To be announced)

We were preparing for the contest starting on November 5th, but the preparation has been delayed due to some bugs found in the development code and we need additional time to investigate them.

We are very sorry to inform you that as a result of considering the work period required to maintain the quality of the contest, we have decided to postpone the date to November 13th (Problem A) and December 4th (Problem B) to January 31st. We apologize for the inconvenience to everyone who was looking forward to it, thank you for your patience for a while. We will continue to prepare for the event starting on November 13th, and your understanding would be greatly appreciated.

The programming contest is open to everybody, regardless of age, nationality, or gender. Everyone, who is interested in participating in the contest, is warmly invited to join through the following websites:

<https://atcoder.jp/contests/hokudai-hitachi2021?lang=en>

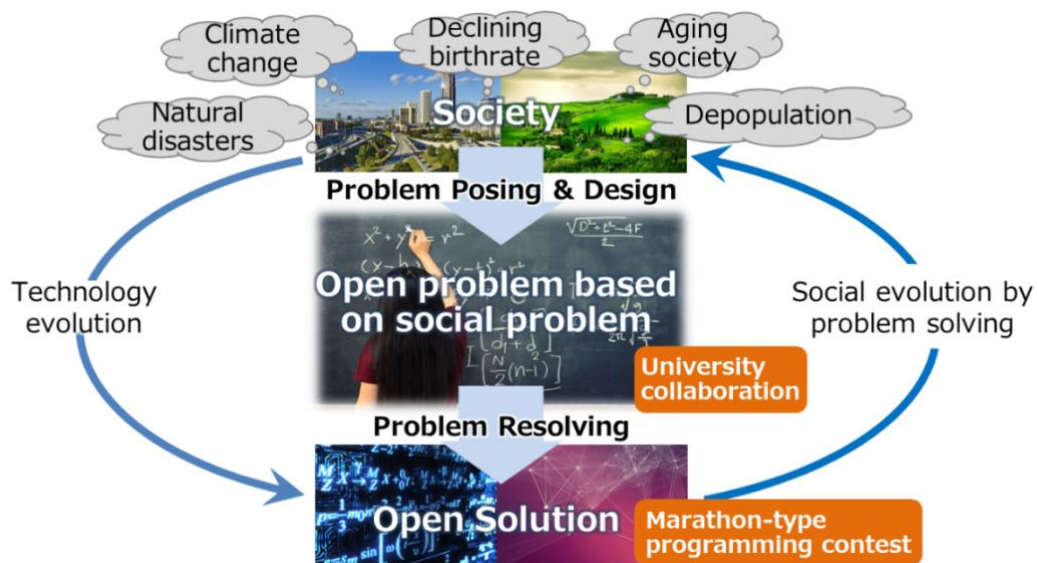


Figure 1: Social problem-solving through open problem based on social problem

*A marathon-type programming contest is an event in which submissions can be made for several days. This year, both contests will be open for a submission period of three months.

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