

## Application Guidelines for Computational Science Alliance Summer School 2018 ---Machine Learning and Computational Science

### 1. Overview

Thanks to recent development of computer science and computational science, machine learning has impacted not only on data science, but also on physics, chemistry, and materials science. The computational science alliance holds a summer school on machine learning, Computational Science Alliance Summer School 2018---Machine Learning and Computational Science, to seize the opportunity.

From usage of GPGPU that has attracted much attention as a hardware for machine learning, an standard optimization scheme in machine learning, Bayesian optimization, to cutting-edge application of machine learning based on Boltzmann machine, let's enjoy the lectures and exercise on machine learning.

### 2. Lectures and lecturers

0. "How to use supercomputer"

1. GPU computing by OpenACC and CUDA

Lecturer: Masaharu Matsumoto (Department of Computer Science)

2. Bayesian optimization

Lecturer: Ryo Tamura (Graduate School of Frontier Sciences)

3. Boltzmann machine and many-body problems

Lecturer: Yusuke Nomura (Department of Applied Physics)

4. Group work: Let's solve your problems by machine learning

\*Tentative program is available below (see 10.).

### 3. Schedule and Venue

Start: August 22th, 2018, Close: August 24th, 2018

Exercise room, B1F of Fukutake Hall, Hongo campus (to be confirmed)

\*The summer school is surely held in Hongo campus.

### 4. Target participants of the summer school

Under graduate, master course, doctor course students, and young researchers (such as postdoc and research assistants) who belong to the University of Tokyo.

Maximum number of participants: about 20.

#### 5. Requirement for participation

(1) A participant must belong to the University of Tokyo.

(2) A participant must have an ECCS (Educational Campus-wide Computing System) account at least at the beginning of the summer school.

(3) A participant is expected to be familiar with file operations, editing, and commands in the UNIX system.

(4) A participant is expected to have basic knowledge for programming and programming languages (c, fortran, ...).

In order to use supercomputer, you must be staying in Japan for more than six months. If you are a student from abroad, please include the information whether you are staying in Japan more than six months or not. (Even if you have not been in Japan more than six months, you can participate in topics which do not use the supercomputer.)

#### 6. Fee

Registration fee: free

We plan to collect about 2000 yen for an informal discussion with meal.

#### 7. Application

Please send email to [summerschool@compsci-alliance.jp](mailto:summerschool@compsci-alliance.jp) by describing the following information.

- Name
- Affiliation 1: Faculty (e.g. Faculty of Science)
- Affiliation 2: Department (e.g. Department of Physics)
- (For students) year
- Email address
- Phone number

● Topics you are interested in (you may attend every topic). This is a survey for preparations. Regardless of your selection here, you can participate to all topics on the summer school if you want.

For students who have not been registered with the computational science alliance, please register yourself with the computational science alliance through <http://www.compsci-alliance.jp> .

We will send email when we accept your registration. If you do not receive any responses until **August 12th**, please ask the secretariat ([secretariat@compsci-alliance.jp](mailto:secretariat@compsci-alliance.jp)) .

If you cancel your participation, please ask the secretariat as soon as possible.

#### 8. Registration deadline

**August 10th, 2018**

#### 9. Contact

Computational science alliance secretariat:

[secretariat@compsci-alliance.jp](mailto:secretariat@compsci-alliance.jp)

#### 10. Tentative program:

August 22nd, 2018

10:00-10:30 How to use the supercomputer

10:45-12:15 GPU 1

13:30-15:00 Boltzmann machine 1

15:15- Group work

18:00- Informal discussion

August 23rd, 2018

10:00-11:30 Bayesian optimization

13:00-14:30 GPU 2

13:30-15:00 Boltzmann machine 2

15:15- Group work

August 24th, 2018

10:00-12:00 Group work

13:00- Presentation based on your achievement and discussion