

Agreement for International Research Collaboration using TSUBAME

Collaborative Research Theme

“Simulation of Tsunamis Generated by Earthquakes Using Parallel Computing Technique”

This Agreement is aimed to promote the international science and technology cooperation between Tokyo Institute of Technology and overseas organizations including research institutions, universities and private firms with understanding that development of research collaboration will contribute to the benefit of international community.

Article 1: Parties

This agreement is entered into between Global Scientific Information and Computing Center, Tokyo Institute of Technology (hereafter referred to as Tokyo Tech) and the Faculty of Engineering, Chulalongkorn University, Bangkok, Thailand (hereafter referred to as CU). Both hereinafter referred to as the Parties collectively, or Party individually. The Parties shall conduct their research collaboration using Tokyo Tech's Supercomputing Grid TSUBAME (hereafter referred to as TSUBAME) to facilitate the required computation, data processing and data storage within the following Articles.

Article 2: Research Implementation

The Parties will cooperate in exchange of knowledge and discussion. The clear statement of research contents summarizing objectives, methodology and contribution due to the usage of result are attached in Annex I. The computation load and environment needed to accomplish the research collaboration must be estimated and specified in Annex II. Any other forms of cooperation will be negotiated for each specific case and sign a Specific Agreement.

Article 3: Researchers

The Parties shall establish their research members by mutual agreement. The name list of research member, nationality, title, affiliation and office address are provided in Annex III. The research member of the Parties must undertake to use TSUBAME for the purpose and under the scope specified by the Agreement strictly. Activities relative to this agreement shall be recognized by the representatives or head of the Parties' affiliation. Neither Party shall assign, transfer or otherwise dispose of this Agreement in whole or in part or any right or obligation hereunder to any individual, firm,

institution or corporation without the prior consent of the other Party in writing, which consent shall not be unreasonably withheld.

Article 4: Rights in Works

Confidential information, publications, intellectual property, patent, copyright, software license, protection of personal data shall follow the rules and regulations provided by Global Scientific Information and Computing Center of Tokyo Tech*, unless any specific stipulation is agreed and stipulated in a Specific Agreement. Parties shall obtain the permission for the other Party if technology or results collaboratively developed by the Parties are transferred to the third Party. The allocation and service charge will be decided by Tokyo Tech.

Article 5: Dispute and Revision

The Agreement may be amended by mutual consent between both Parties. Such amendments shall enter into force on a date mutually agreed by both Parties. Particulars not addressed in the Agreement or any dispute arising from the interpretation or implementation of this Agreement shall be resolved by amicable consultations and negotiation between the Parties. The Parties may enter into any Special Agreement, provided that it is not customary to the purport of this Agreement, the laws and general customs.

Article 6: International Issues**

The Parties shall follow the agenda complied with the International Conventions, Controls and Treaties ratified by Japan in an effort aimed at peace and stability in the international community and human security.

Article 7: Period

This agreement will be effective upon the date of signature by the authorized representatives of the Parties' affiliation. It shall be subject to review at the end of Tokyo Tech's academic year (March, 31) and shall be amended or extended by prior written agreement between the Parties. The Agreement may be terminated by either Party by sending the written notice to the other Party on termination of the Agreement. Tokyo Tech reserves the right to terminate the Agreement immediately once it is found

* Refer to GSIC rules and regulations

** The Parties represent and warrant that they shall not use any technology or results obtained under this Agreement and their replicas for the purpose of developing or manufacturing nuclear, chemical or biological weapons or missiles to deliver any such weapons and fully commit to non-proliferation of all types of weapon development. Furthermore, the Parties shall not allow any third party to use them for the said purpose.

that the other Party obviously violates the Agreement. The provisions in Article 5 will remain in force after the termination of this Agreement or the Specific Agreements.

This Agreement is made in two identical sets officially certified to be authentic. Both Parties, having read and understood throughout the terms and conditions, hereby sign this Agreement on the date written above.

Date: 2007.11.16



(Prof. Osamu Watanabe)
Director of Global Scientific Information
and Computing Center
Tokyo Institute of Technology

Date: 2007.11.13



(Prof. Direk Lavansiri)
Dean of Faculty of Engineering
Chulalongkorn University

Annex I
(Research Contents)

Topic: Simulation of Tsunamis Generated by Earthquakes Using Parallel Computing Technique

Objectives:

1. To simulate the height of tsumamis and travelling time
2. To tune up and test the computer program developed for PC cluster of CU with TSUBAME

Methodology:

1. To study the mechanisms of earthquakes occurring in the Andaman Sea and South China Sea in order to define input parameters for analyses (CU)
 - To define earthquake epicenters and mechanisms
 - To select 1,000 scenarios of earthquakes
 - To estimate the width, length and displacement of faults
2. To collect bathymetry data (CU)
 - To obtain bathymetry data from Hydrographic Department, Royal Thai Navy
 - To collect bathymetry data of General Bathymetric Chart of the Oceans or ETOPO2
 - To prepare the bathymetry and topography for different regions of computation
3. To test and validate the program (CU+GSIC)
 - To perform program tuning
 - To develop visualization technique
4. To perform numerical simulation of tsunamis (CU+GSIC)
 - To compute surface deformation for tsunami simulation
 - To compute arrival time and wave height
 - To visualize results
5. To investigate the performance of TSUBAME and the efficiency of parallel computing in large-scale computation (CU+GSIC)

Contribution:

The computation results and outcome of joint researches will make to the public for academic contribution in an attempt to minimize the loss of lives and damage to infrastructures caused by tsunami disasters

Annex II
(Allocation)

Number of running cases : approximately 500 cases (half of the whole project cases)

CPU time : 1.5 hours/case (estimated by PC dual-core 3.4GHz)

HDD size : 4 GB/case

Memory size : 2GB RAM

Required software : FORTRAN Compiler

Annex III
(Research Members)

Tokyo Tech (2 persons)

No. 1

Name	Thirapong PIPATPONGSA
Nationality	Thai
Title	Associate Professor
Affiliation	Global Scientific Information and Computing Center, Tokyo Institute of Technology
Office address	2-12-1 O-okayma, Meguro-ku, Tokyo, 152-8550, JAPAN
Contact	Tel: +81-3-5734-2121 Fax: +81-3-5734-3276 E-mail: pthira@gsic.titech.ac.jp

No. 2

Name	Takayuki AOKI
Nationality	Japanese
Title	Professor
Affiliation	Global Scientific Information and Computing Center, Tokyo Institute of Technology
Office address	2-12-1 O-okayma, Meguro-ku, Tokyo, 152-8550, JAPAN
Contact	Tel: +81-3-5734-2121 Fax: +81-3-5734-3276 E-mail: taoki@gsic.titech.ac.jp

CU (6 persons)

No. 1

Name	Anat RUANGRASSAMEE
Nationality	Thai
Title	Assistant Professor
Affiliation	Department of Civil Engineering, Faculty of Engineering, Chulalongkorn University
Office address	Phyathai Road, Pathumwan, Bangkok, 10330, THAILAND
Contact	Tel: +66-2-218-6571 Fax: +66-2-251-7304 E-mail: fcearr@eng.chula.ac.th

No. 2

Name	Veera MUANGSIN
Nationality	Thai
Title	Lecturer
Affiliation	Department of Computer Engineering, Faculty of Engineering, Chulalongkorn University
Office address	Phyathai Road, Pathumwan, Bangkok, 10330, THAILAND
Contact	Tel: +66-2-218-6981 Fax: +66-2218-6955 E-mail: veera.m@chula.ac.th

No. 3

Name	Artith INTAVEE
Nationality	Thai
Title	Student
Affiliation	Department of Civil Engineering, Faculty of Engineering, Chulalongkorn University
Office address	Phyathai Road, Pathumwan, Bangkok, 10330, THAILAND
Contact	Tel: +66-2-218-6571 Fax: +66-2-251-7304 E-mail: am.der@hotmail.com

No. 4

Name	Theerayut KOSIN
Nationality	Thai
Title	Student
Affiliation	Department of Computer Engineering, Faculty of Engineering, Chulalongkorn University
Office address	Phyathai Road, Pathumwan, Bangkok, 10330, THAILAND
Contact	Tel: +66-2-218-6981 Fax: +66-2218-6955 E-mail: mindpeterpan@hotmail.com

No. 5

Name	Pemjit APHIMAETEETHOMRONG
Nationality	Thai
Title	Student
Affiliation	Department of Computer Engineering, Faculty of Engineering, Chulalongkorn University
Office address	Phyathai Road, Pathumwan, Bangkok, 10330, THAILAND
Contact	Tel: +66-2-218-6981 Fax: +66-2218-6955 E-mail: pemjit.a@gmail.com

No. 6

Name	Kittipat VIROCHSIRI
Nationality	Thai
Title	Student
Affiliation	Department of Computer Engineering, Faculty of Engineering, Chulalongkorn University
Office address	Phyathai Road, Pathumwan, Bangkok, 10330, THAILAND
Contact	Tel: +66-2-218-6981 Fax: +66-2218-6955 E-mail: kittipat@thisblupla.net