Joint Usage/Research Center for Interdisciplinary Large-Scale Information Infrastructures
2023 Joint Research Projects

2023 Joint Research Projects: 68 Projects (105joint research centers)
【International 4, General 64】
※25 Exploratory Joint Research Projects are adopted as well. (As of April 15 2023)

CS：Large-scale computational science area　　DS：Data science/data usage area

NA: Very large-scale numerical computation　　DA:Very large-scale data processing
NW:Very large capacity network technology　　IS:Very large-scale information syste

International Joint Research Projects

Project Title	Representative(Affiliation)	Area	Category	Joint Research Center
Hierarchical low-rank approximation methods on distributed memory and GPUs	Rio Yokota （ Tokyo Institute of Technology ）	CS	NA	Hokkaido, UTokyo, Tokyo Tech, Kyusyu
High resolution simulation of cardiac electrophysiology on realistic whole-heart geometries	Kengo Nakajima （ The University of Tokyo ）	CS	NA, DA	UTokyo,Nagoya
Developing AI-assisted high performance fluid simulation codes	Shinya Maeyama （ Japan Atomic Energy Agency →National Institute for Fusion Science ）	CS	NA	UTokyo, Tokyo Tech
Innovative Multigrid Methods III	Akihiro Fujii （ Kogakuin University ）	CS	NA	Hokkaido, UTokyo, Nagoya, Kyusyu

General Joint Research Projects（1/3）

Project Title	Representative(Affiliation)	Area	Category	Joint Research Center
Improvements of FMO program ABINIT-MP for huge scale systems	Yuji Mochizuki （ Rikkyo University ）	CS	NA	Tohoku, Nagoya, Kyusyu
Large-scale aeroacoustic simulation on wind instruments and acoustic equipments	Kinya Takahashi （ Kyushu Institute of Technology ）	CS	NA	Nagoya, Kyusyu
Uncertainty Quantification of extreme weather prediction	Yohei Sawada （ The University of Tokyo ）	CS	NA	UTokyo
Development of high-performance parallel code for LES of MHD turbulence	Hideaki Miura （ National Institute for Fusion Science ）	CS	NA	UTokyo, Nagoya
New Horizon Technology of Auto-tuning by Software Engineering	Takahiro Katagiri （ Nagoya University ）	CS	NA	UTokyo, Nagoya, Kyusyu
Research, development and application of realistic particle simulation code for plasma interdisciplinary science	Hiroaki Ohtani （ National Institute for Fusion Science ）	CS	NA	Tohoku, Nagoya, Kyoto
Heat and fluid flow simulation for high-performance electric motor	Masayuki Kaneda （ Osaka Metropolitan University ）	CS	NA	Tokyo Tech
Study on high performance computing techniques for QR factorization	Takeshi Fukaya （ Hokkaido University ）	CS	NA	Hokkaido, Kyusyu
Synthetic Population Project: Population Synthetis Based on 2020 National Census	Tadahiko Murata （ Kansai University ）	DS	NA, DA, IS	Hokkaido, UTokyo, Osaka
Real-time wide-area river simulation using 1-m mesh resolution for sediment and flood damage prediction	Takayuki Aoki （ Tokyo Institute of Technology ）	CS	NA	Tokyo Tech
Development of Data Assimilation Methods and Observation Systems for a Wind Digital Twin in Urban Areas	Naoyuki Onodera （ Japan Atomic Energy Agency ）	CS	NA	UTokyo
Construction of a platform for standardization of water environment assessment by an integrated system for evaluation of the water environment	Yoshitaka Matsuzaki （ National Institute of Maritime, Port and Aviation Technology ）	CS	IS	-
Construction of Structural Variation Panel and Annotation using Hybrid Cloud System	Masao Nagasaki （ Kyoto University ）	DS	NW	UTokyo, Kyoto, Kyusyu
Innovative Computational Science by Integration of Simulation/Data/Learning under Heterogeneous Computing Environment	Kengo Nakajima （ The University of Tokyo ）	CS	NA, DA, NW, IS	UTokyo, Nagoya, Kyusyu
Large-scale simulation of the interaction between turbulence and particles with internal degrees of freedom	Takeshi Watanabe （ Nagoya Institute of Technology ）	CS	NA	Nagoya
Coastal marine ecosystem prediction in Tokyo Bay by machine learning and numerical simulation	Jun Kikuchi （ RIKEN ）	CS	NA, DA, IS	UTokyo
Development of a Multi-Resolution Particle Solver with Background Cell Preconditioning	Mitsuteru Asai （ Kyushu University ）	CS	NA	UTokyo
Research on reliability improvement of deep learning-based medical image processing	Masahiro Oda （ Nagoya University ）	CS	NA	Nagoya

General Joint Research Projects（2/3）

Project Title	Representative(Affiliation)	Area	Category	Joint Research Center

Evaluation of flood protection value for irrigation ponds in Japan	So Kazama （ Tohoku University ）	CS	NA	Tohoku
Visualizing and discovering morphological mutations on skeletal specimens using CT imaging and deep learning	Takashi Morita （ Osaka University ）	DS	DA	-
Accelarations of Polymer Materials Simulations through GPU Parallel Computing	Katsumi Hagita （ National Defense Academy ）	CS	NA	UTokyo, Nagoya, Osaka
Study on Next Generation Accelerator and Its file IO	Toshihiro Hanawa （ The University of Tokyo ）	CS	IS	UTokyo, Nagoya
Construction of a machine learning model of fluid flow with fluctuation of unstable dimensions	Yoshitaka Saiki （ Hitotsubashi University ）	CS	NA	-
Large-scale phase-field lattice Boltzmann simulations for accurate material microstructure prediction during additive manufacturing	Tomohiro Takaki （ Kyoto Institute of Technology ）	CS	NA	Tokyo Tech
Mass generation mechanism of composite scalar particle in lattice QCD	Motoo Sekiguchi （ Kokushikan University ）	CS	NA	Osaka
Improvement of interface capturing method for gas-liquid two-phase flow analysis in nuclear energy field	Kenta Sugihara （ Japan Atomic Energy Agency ）	CS	NA	UTokyo, Tokyo Tech
Investigation of intramolecular magnetic interaction in rare-earth-based molecular magnets	Anas Santria （ Osaka University ）	CS	NA	-
Large-scale comparative genomic analysis to elucidate the evolution and infectious process of pathogenic bacteria	Masaya Yamaguchi （ Osaka University ）	CS	NA	-
Fusion of high-performance wave analysis techniques and data science toward the realization of NDE4.0	Takahiro Saitoh （ Gunma University ）	CS	NA	Hokkaido, Kyoto
Practical acceleration methods to achieve high performance for large-scale applications	Takashi Shimokawabe （ The University of Tokyo ）	CS	NA	UTokyo, Nagoya
Materials Informatics based on Absolute Energy Estimation by TOMBO	Yoshiyuki Kawazoe （ Tohoku University ）	CS	NA	Kyusyu
Development of a High-performance Simulation Code for Offshore Wind Farms Based on the Lattice Boltzmann Method	Seiya Watanabe （ Kyushu University ）	CS	NA	Tokyo Tech
Large-scale Diffusion Models for Text Generation	Li Zihui （ The University of Tokyo ）	DS	DA	UTokyo
Study on Multi-scale Space Plasma Simulations with Cross-Reference Framework	Yohei Miyake （ Kobe University ）	CS	NA	Kyoto, Kyusyu
Development of surrogate models predicting time-dependent fluid dynamics simulations	Takashi Shimokawabe （ The University of Tokyo ）	CS	NA, DA	UTokyo
Research for Mahjong AI using deep reinforcement learning	Yoshimasa Tsuruoka （ The University of Tokyo ）	DS	DA	-
Application of Software Auto-Tuning Technology to Machine Learning Software (2)	Teruo Tanaka （ Kogakuin University ）	CS	NA	Nagoya, Kyusyu
Multifaceted approach to construct a realistic scenario of gas dissipation in protoplanetary disks	Shinsuke Takasao （ Osaka University ）	CS	NA	-
Aortic dissection simulation model based on fluid-structure interaction analysis	Ryo Takeda （ Hokkaido University ）	CS	NA	-
Research on realization of medical image analysis platform by linking database platform and HPC platform via SINET	Kohei Murao （ National Institute of Informatics ）	DS	NA, DA, NW, IS	Nagoya
Numerical Investigation on the Effect of Combustor Size on Detonation Propagation in Rotating Detonation Engine	Akiko Matsuo （ Keio University ）	CS	NA	Tohoku
Multiscale modelling of materials for mechanics	Masaki Tanaka （ Kyushu University ）	CS	NA	-
Investigating the global effects of realistic spatio-temporally varying anthropogenic heat emissions using a high-resolution global climate model	VARQUEZ Alvin Christopher Galang （ Tokyo Institute of Technology ）	CS	NA	-
High-performance and Highly-reliable Numerical Methods and Applications	Takeshi Ogita （ Tokyo Woman's Christian University ）	CS	NA	Hokkaido, UTokyo, Tokyo Tech, Nagoya, Kyusyu
Database Construction of Polymer Informatics for Sound Material-Cycle Society	Masahiro Sato （ The University of Tokyo ）	DS	NA, DA	UTokyo
Performance Modeling Methodology for Modern Many-Core Systems	Tetsuya Hoshino （ Nagoya University ）	CS	NA	UTokyo, Nagoya
Combination of HPC and high-speed data transfer technologies for big-data processing systems	Takeshi Murata （ National Institute of Information and Communications Technology ）	DS	DA, NW, IS	Hokkaido, Tohoku, UTokyo, Nagoya, Kyoto, Osaka, Kyusyu

General Joint Research Projects（3/3）

Project Title	Representative(Affiliation)	Area	Category	Joint Research Center
Optimization of resource mapping for many-core CPU and GPU	Masatoshi Kawai （ The University of Toyo ）	CS	NA	UTokyo, Nagoya
Machine Learning for Soft-Matter Flows	John Molina （ Kyoto University ）	CS	NA, DA	UTokyo

Integrated Simulation of Aerodynamics, Propulsion, and Structure to Establish Design Study Techniques for Propeller-Driven Small Aircraft	Masahiro Kanazaki （ Tokyo Metropolitan University ）	CS	NA	Hokkaido
Efficient Method for Integrated Optimization of Flow Control Devices and Body Geometries	Takashi Matsuno （ Tottori University ）	CS	NA	Hokkaido
Development of predictive models for the dynamics of amorphous systems by graph neural networks and generative models	Hayato Shiba （ The University of Tokyo ）	CS	NA	UTokyo
Construction of Anharmonic Phonon Database and Data-driven Development Thermal Functional Materials	Junichiro Shiomi （ The University of Tokyo ）	CS	NA	-
Research, development, and evaluation of system software for next-generation academic IT infrastructure	Yohei Kuga （ The University of Tokyo ）	DS	IS	Hokkaido, UTokyo
Waveform tomography for the structure model of the subduction zones by using large-scale seismic-wave simulations: the source region of the 2011 Tohoku-Oki earthquake and the Ryukyu (Nansei-Shoto) island arc	Taro Okamoto （ Tokyo Institute of Technology ）	CS	NA	Tokyo Tech
Integrated system for machine learning molecular dynamics simulations	Masahiko Okumura （ Japan Atomic Energy Agency ）	DS	NA	UTokyo
High performance computing for large-scale unclarified slope disasters by using MPM and FEM	Kenjiro Terada （ Tohoku University ）	CS	NA	UTokyo
Visualization and Statistical Modeling of Financial Big Data	Masayuki Jimichi （ Kwansei Gakuin University ）	DS	―	-
Development of dependency-parsers for “untokenized” natural languages	Koichi Yasuoka （ Kyoto University ）	DS	―	-
Representation Learning for Large-scale Geospatial Data Towards Society 5.0	Toyotaro Suzumura （ The University of Tokyo ）	DS	―	UTokyo
Advanced utilization of multi-dimensional high definition earth surface data (MHESD) in earth sciences, history and archaeology	Yuichi Hayakawa （ Hokkaido University ）	DS	―	-
Developing a Platform for Constructing and Sharing of Large-Scale Japanese Language Models	Akiko Aizawa （ National Institute of Informatics ）	DS	―	UTokyo
Development of the data platform of Tomo-e Gozen	Satoshi Takita （ The University of Tokyo ）	DS	―	-
Pre-trained model based on Graph Neural Network for Material Property Prediction	Masatoshi Hanai （ The University of Tokyo ）	DS	―	UTokyo

※Affiliation information is as of the time of adoption