AMDS 2024 Program

Plenary Session

2024.11.14

Time	Speaker	Affiliation	Presentation Title
Opening Ceremony (15:30-16:00)			
Plenary Session Chairs：Prof. Tongyi Zhang, Dr. Yibin Xu			
16:00 -16:30	Yong-hak Huh	The Korea Research Institute of Standards and Science, Korea	Issues and Strategies for Materials Data Sharing
16:30-17:00	Satoshi Minamoto	National Institute for Materials Science, Japan	Operation of Materials Data Platform in NIMS
17:00-17:30	Peng Wang	Chinese Society for Testing & Materials, China	Construction of the (CSTM) Material Data Standard System
17:30-18:00	Heiko B. Weber	University of Erlangen-Nuremberg, Germany	Experimental Research Data in Materials Science and Solid-State Physics: Challenges, Strategies and Solutions

Symposium: Materials Data Management and Image Data

Convenors：Prof Haiqing Yin, Prof Xuejing Shen, Prof Dawei Zhang

2024.11.15

Time	Speaker	Affiliation	Presentation Title
Materials Data Management (1) Chairs：Prof. Hong Wang，Dr. Kwang-Ryeol Lee			
8:30-9:00	Kwang-Ryeol Lee	Korea Institute of Science and Technology, Korea	Standardization of Materials R&D Data Scheme and Vocabulary
9:00-9:25	Hong Wang	Shanghai Jiao Tong University, China	The standard system for AI ready materials data
9:25-9:50	Yi Zhang	China National Building Materials Group Co, Ltd., China	Exploration and application of digital transformation in the inorganic non-metallic materials industry
9:50-10:15	Takuya Kadohira	National Institute for Materials Science, Japan	Management of experimental data in NIMS
Coffee break			
Materials Data Management (2) Chairs: Prof. Lanting Zhang, Prof. Siqi Shi			
10:35-11:00	Siqi Shi	Shanghai University, China	Constructing high-performance Machine Learning Models depends on high-quality materials data
11:00-11:25	Isao Kuwajima	National Institute for Materials Science, Japan	Data collection and retrieval system in NIMS

11:25-11:50	Lanting Zhang	Shanghai Jiao Tong University, China	Some key considerations on materials data ecology in the context of large models
11:50:12:10	Zhigang Yu	Shanghai University, China	An unbiased recommendation framework mining the optimal combination of data subsets and algorithms
Luncheon			
Materials Data Management (3) Chairs: Dr. Lingling Ren, Prof. Jie He			
13:30-14:00	Lingling Ren	Materials measurement laboratory, National Institute of Metrology of China	Metrology and traceability of materials big data
14:00-14:25	Cheng Xu	University of Science and Technology Beijing, China	Toward Collaborative Intelligence: Secure Big-data Sharing and Computing in Materials Genomics Engineering
14:25-14:50	Xing Wu	Shanghai University, China	A Spatial-frequency Domain-based image Noise Suppression Model and Application in Silicon Chip Defect Detection
14:50-15:15	Xingjian Huang	Huawei Technologies Co. LTD	Ecological construction practices for industrial software simulation materials data
15:15-15:35	Jie He	University of Science and Technology Beijing, China	MGED-Assistant：Smart Material Database Powered by LLM
Coffee break			
Materials Image Data Chairs: Dr. Jaimyun Jung, Prof. Xiaojuan Ban			
15:55-16:25	Jaimyun Jung	Korea Institute of Materials Science, Korea	Inverse design of 3D microstructures using latent diffusion model
16:25-16:50	Xiaojuan Ban	University of Science and Technology Beijing, China	An approach to efficiently extracting microstructures via visual large model
16:50-17:15	Sangil Hyun	Korea Institute of Ceramic Engineering and Technology, Korea	Virtual characterization models developed by multiphysics computer simulation & data-driven AI for ceramic manufacturing process
17:15-17:40	Yuexing Han	Shanghai University, China	Research on Machine Learning Methods for Mining Material Properties from Material Images
17:40-18:00	Jianfeng Jin	Northeastern University, China	A Web-based System for Automated Microstructure Recognition and Mechanical Properties Prediction of Polycrystalline Alloys
18:00-18:20	Weiho Wan	The NCS Testing Technology Co., Ltd, China	A high-throughput statistical mapping characterization method for microstructure based on multi-element coupling

Symposium: Data Driven Materials Design

Convenors：Prof Haiqing Yin, Prof Woo Jin CHOI, Prof Wei Ren

2024.11.15

Time	Speaker	Affiliation	Presentation Title
Materials Calculation and Data Chairs：Prof. Lei Shen, Prof. Yong Du			

8:30-9:00	Seungwu Han	Seoul National University, Korea	SevenNet: a pretrained universal machine learning force fields
9:00-9:25	Yong Du	Central South University, China	Intelligent design of Al alloy by integrating CALPHAD, machine learning and key experiments
9:25-9:50	Lei Shen	National University of Singapore, Singapore	High-throughput calculations of 2D heterostructures
9:50-10:15	In Kim	Korea Institute of Ceramic Engineering and Technology, Korea	Advancing the Development of Polymer Compo sites through Artificial Intelligence
Coffee break			
Data-driven Materials Design (1) Chairs: Dr. Yibin Xu, Dr. Jungho Shin			
10:35-11:00	Yibin Xu	National Institute for Materials Science, Japan	Data-driven Exploration for Li Ionic Conductor
11:00-11:25	Jungho Shin	Korea Research Institute of Chemical Technology, Korea	Web-based Interface for Search and Analysis of Materials Data: ChemDX and MatDX
11:25-11:50	Zhe Liu	Northwestern Polytechnical University, China	Design and Screening of Functional Organic Molecules for Perovskite Solar Cells via Machine Learning
11:50-12:10	Heechae Choi	Xi'an JIaotong-Liverpool University, China	TBD
Luncheon			
Data-driven Materials Design (2) Chairs: Dr. Ho Won Lee, Dr. Guojun Wang, Prof. Deng Pan			
13:30-14:00	Ho Won Lee	Korea Institute of Materials Science, Korea	Overcoming Small Dataset Challenges in Semantic Segmentation of Metallographic Microscopy Images
14:00-14:25	Guojun Wang	Chinalco Materials Application Research Institute Co., Ltd, China	Design and development of high performance aluminum alloy based on integrated computing and machine learning
14:25-14:50	Xiaodong Xiang	Southern University of Science and Technology	New AI Algorithm for Materials Science
14:50-15:15	Deng Pan	Shanghai University, China	KAN Made Learning Physics Laws Simple
15:15-15:35	Song Sun	Anhui University, China	Material Genome Engineering in Catalysis
Coffee break			
Data-driven Materials Design (3) Chairs: Dr. Sehyeok Oh, Prof. Yi Liu			
15:55-16:25	Sehyeok Oh	Korea Institute of Materials Science, Korea	Innovative Applications of AI to Mechanical /Materials Processing
16:25-16:50	Yi Liu	Shanghai University	"What you need is pre-attention": Small-data machine learning with center-environment features
16:50-17:15	Hoheok Kim	Korea Institute of Materials Science, Korea	Deep learning application for modeling the heat treatment condition-microstructure-property relationship

17:15-17:40	Haiqing Yin	University of Science and Technology Beijing, China	Screening strategy for refractory high-entropy alloys
17:40-18:00	Yuan Tian	Shanghai University, China	Noise-aware active learning to develop high-temperature shape memory alloys with large latent heat
18:00-18:20	Haiyou Huang	University of Science and Technology Beijing, China	Finding New High-Temperature Superconductors Based on Crystal Graph Neural Networks

FMGE-AMDS Joint Symposium: Materials Big Data and AI for Science

Convenors：Prof Yanjing Su, Prof. Dezhen Xue, Prof Yi Wang

2024.11.15

Time	Speaker	Affiliation	Presentation Title
AI Algorithm for Materials(1) Chairs: Prof. Xiang Chen, Prof. Xiaoyu Chong			
8:30-8:55	Turab Lookman	AiMaterials Research, LLC	How can theory guide data science?
8:55-9:20	Alex Ganose	Imperial College London, UK	Computational Materials Discovery in the Age of Automation
9:20-9:45	Xiang Chen	Tsinghua University, China	Artificial Intelligence Design of Lithium Battery Electrolytes
9:45-10:10	Jiayu Peng	University at Buffalo, USA	Bridging physics-informed and data-driven materials designs to catalyze deep decarbonization
Coffee break			
AI Algorithm for Materials(2) Chairs: Prof. Huadong Fu, Prof. Yi Wang			
10:25 -10:55	Hongming Weng	Institute of Physics, Chinese Academy of Sciences, China	Data Resource Construction for Condensed matter quantum material science and AI empowerment
10:50-11:15	Yue Li	The Max Planck Institute for Sustainable Materials, Germany	Artificial intelligence-enhanced atom probe microscopy: Local chemical ordering analysis
11:15-11:40	Shanshan Wang	National University of Defense Technology, China	Machine learning empowered material atomic structural understanding
11:40-12:05	Jie Xiong	Shanghai University, China	Domain Knowledge Embedded Materials Data Mining
Luncheon			
Large Language Models for Materials Chairs: Prof. Dezhen Xue, Prof. Yicong Ye			
13:30-13:55	Tongqi Wen	The University of Hong Kong, China	Small and Large Atomic/Language Models for Materials Science
13:55-14:20	Yicong Ye	National University of Defense Technology, China	MatPilot, an AI Materials Scientist Empowered by Large Language Models: Intelligent R&D Practice for Functional Ceramics
14:20-14:45	Xue Jiang	University of Science and Technology Beijing, China	Steel design based on a large language model

14:45-15:10	Zhaoyan Sun	Changchun Institute of Applied Chemistry, China	Genetic Engineering of Polymer Materials: Small Data, Model Interpretability, and Large Language Models
15:10-15:35	Yue Liu	Shanghai University, China	Empowering Material Knowledge Extraction with Large Language Models
15:30-15:50	Jue Wang	Chengdu Caizhi Technology Co., Ltd, China	Enhancing Materials Research through LLM: Building a Comprehensive Platform and Facilitating Knowledge-Led Innovation
Coffee break			
Materials Design and Optimization Chairs: Prof. Yuan Wu, Prof. Chenchong Wang			
16:05-16:30	Yuan Wu	University of Science and Technology Beijing, China	Multi-objective co-design strategy of low modulus and high yield strength for high entropy alloys
16:30-16:55	Xiaoyu Chong	Kunming University of Science and Technology, China	The Design and Application of Noble Metal-Based Superalloys Driven by the Synergy of Physical Models and Machine Learning
16:55-17:20	Lixian Lian	Sichuan University, China	Multi-objective intelligent optimization design and development of new superalloys
17:20-17:45	Ziyuan Rao	Shanghai Jiao Tong University, China	Alloy Design Based on Artificial Intelligence and Machine Learning
17:45-18:10	Ruihao Yuan	Northwestern Polytechnical University, China	Deep learning strengthening mechanism for high fidelity inverse design of microstructure

The 3rd Workshop towards Materials Data Standards on Challenges and opportunities of large language model on materials science 2024.11.16

Chairs: Prof. Hong Wang, Prof. Haiqing Yin

Time	Speaker	Affiliation	Presentation Title
8:30-8:55	Ryo Maezono	Japan Advanced Institute of Science and Technology, JAIST, Japan	AI-recognition of XRD pattern using auto-encoder
8:55-9:20	Lei Zhang	Nanjing University of Information Science and Technology, China	Data-driven language models for materials science
9:20-9:45	Byungju Lee	Korea Institute of Science and Technology, Korea	Accelerating materials language processing with large language models
9:45-10:10	Yuzhi Zhang	DP Technology Co., Ltd, China	New-generation materials design platform empowered by AI foundation models
Coffee break			
10:30-12:10	**Round Table Discussion**		

Prof. Ryo Maezono, Prof. Lei Zhang, Dr. Byungju Lee, Dr. Yuzhi Zhang

Prof. Shuichi Iwata (The University of Tokyo)

Dr. Yibin Xu (National Institute for Materials Science, Japan)

Dr. Satoshi Minamoto (National Institute for Materials Science, Japan)

Dr. Yong-hak Huh (Korea Research Institute of Standards and Science)

Dr. Kwang-Ryeol Lee (Korea Institute of Science and Technology)

Prof. Hong Wang (Shanghai Jiaotong University)

Dr. Peng Wang (Chinese Society for Testing & Materials, China)