7th ZIB – IMI – ISM – NUS – RIKEN – MODAL Workshop on Future Algorithms and Applications
Scientific Program

Day 1, Wednesday – 27 September 2023

10:15 – 11:00   **Registration**

11:00 – 11:30   **Opening Session**
- Prof. Dr. Thorsten Koch (ZIB/TUB)
- Prof. Dr. Masahiko Hayashi (JSPS)
- Shiori Watanabe (JSPS)

11:30 – 13:00   **Plenary Talks (35min + 10min Q&A)**
                     Chair: Prof. Dr. Thorsten Koch
- Prof. Dr. Sebastian Pokutta (ZIB)
  The approximate Carathéodory problem and an application to quantum mechanics
- Prof. Dr. Satoshi Ito (ISM):
  Optimization of measures from a unified perspective

13:00 – 14:00   **Lunch**

14:00 – 15:40   **Session 1 (20min + 5min Q&A)**
                     Chair: Prof. Dr. Ralf Borndörfer
- Dr. Janina Zittel (ZIB):
  Planning Berlin's Energy Transition:

Multi-objective Portfolio Optimization for Decarbonized District Heating

- Dr. Nariaki Tateiwa (NTT):

  Collective Communication Scheduling on Optical Circuit Switch Networks with SmartNIC

- Prof. Dr. Katsuki Fujisawa (IMI):

  Construction of Demonstration Platforms for Realizing Digital Twins

- Prof. Dr. Chou Cheng-Feng (NUS):

  Process Flexibility and Supply Risk Mitigation: A New Methodology for Designing Resilient Supply Chains

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15:40 – 16:10   Coffee Break

16:10 – 17:50   Session 2 (13min + 3min Q&A)

Chair: Prof. Dr. Tasuku Soma

- Dr. Sherief Mostafa Salman Hashima (RIKEN):

  Online Learning Algorithms for Wireless RIS Relay Communications

- Jaap Pedersen (ZIB):

  An efficient solver for multi-objective onshore wind farm siting and network integration

- Yijiong Zhang (NUS):

  Optimal Market Making in a Multi-agent Market under Model Uncertainty:

  A Reinforcement Learning Approach

- Hiroki Ishikura (IMI):

  Realization of smart factories using IP

- Tsuyoshi Ishizone (Meiji Univ.):

  Representation Learning for Protein Conformational Dynamics

- Dr. Kazu Ghalamkari (RIKEN):

  Rank-free Tensor Decomposition Using Energy-based Models

17:50   End

18:00   Welcome Reception

Day 2, Thursday – 28 September 2023

09:30 – 11:00   Plenary Talks (35min + 10min Q&A)

Chair: Prof. Dr. Katsuki Fujisawa

- Prof. Dr. Koji Nakano (Hiroshima Univ.):

  Reducing Ising Model Sizes for Solving Permutation-Based Combinatorial

  Optimization through Dual-Matrix Domain-Wall Encoding

- Dr. Stefan Wörner (IBM Research)

  Quantum Optimization

11:00 – 11:30   Coffee Break

11:30 – 13:00   Session 1 (15min + 3min Q&A)

Chair: Prof. Dr. Chung-Piaw Teo

- Hanqiu Peng (NUS):
  Large – Scale Dynamic Portfolio Optimization with Quantum Algorithms
- Dr. Kai Hoppmann-Baum (Delivery Hero):
  A Short Tale from Industry: The Avoid-Vehicle's-Early-Arrival-Constraint - A Wolf in Sheep's Clothing
- Dr. Quang Minh Ha (RIKEN):
  Fisher-Rao metric and infinite-dimensional divergences between Gaussian processes
- Prof. Dr. Tasuku Soma (ISM):
  Spectral Sparsification of Hypergraphs
- Dr. Mathieu Besançon (ZIB):
  Convex optimization techniques for mixed-integer nonlinear problems

13:00 – 13:45   Lunch

13:45 – 14:00   Group Photos

14:00   Checkpoint Charlie – The Wall Museum

16:30   Visit of Reichstag

19:00   Dinner

Day 3, Friday – 29 September 2023

09:30 – 11:00   Plenary Talks (35min + 10min Q&A)

Chair: Prof. Dr. Ying Chen

- Prof. Dr. Masashi Sugiyama (RIKEN):
  Classification from Positive and Unlabeled Data and Its Application in Audio Signal Enhancement
- Dr. Jakub Tomczyk (SunCable):
  Optimisation of submarine power cable systems

11:00 – 11:30   Coffee Break

11:30 – 13:00   Session 1 (18min + 4min Q&A)

Chair: Prof. Dr. Masashi Sugiyama

- Dr. Xiuqin Xu (McKinsey Singapore):

Data analytics and machine Learning for creating high impact in Mckinsey

- Prof. Dr. Daisuke Sakurai (IMI):
  Revisiting GenéLive! for Rhythm Action Generation
- PD Dr. Tim Conrad (ZIB):
  Understanding microbiome dynamics via interpretable graph representation learning
- Mark Turner (TUB):
  Cutting Plane Selection for Mixed-Integer Linear Programming

13:00 – 14:00   Lunch

14:00 – 15:40   Session 2 (16min+ 4min Q&A)
Chair: PD. Dr. Timo Berthold

- Dr. Stefan Vigerske (GAMS):
  Global Optimization of Mixed-Integer Nonlinear Programs with SCIP 8
- Dr. Ksenia Bestuzheva (ZIB):
  SCIP beyond 8.0
- Leona Gottwald (FICO):
  Solving nonconvex MINLPs to global optimality with FICO Xpress Global
- Dr. Roland Wunderling (GUROBI):
  Combining Machine Learning with Optimization using Gurobi-machine learning
- Dr. Gerald Gamrath (COPT):
  Recent advances in the Cardinal Optimizer

15:40 – 16:10   Coffee Break

16:10 – 17:50   Session 3 (16min + 4min Q&A)
Chair: Prof. Dr. João Pedroso

- Dr. Shen Xun (Osaka Univ.):
  Chance Constrained Probability Measure Optimization: Problem Formulation, Equivalent Reduction, and Sample-based Approximation
- Dr. Junshi Xia (RIKEN):
  Mapping High-resolution Land Cover Product Anywhere
- Yivan Zhang (RIKEN):
  Categorification of Disentangled Representation Learning
- Shuo Chen (RIKEN):
  Robust Contrastive Learning and Its Applications
- Dr. Lin Gu (RIKEN):
  Continuous Learning in Both Medical and General Domains

17:50   End

18:30   Dinner and Magic show at Museum

Day 4, Saturday - 30 September 2023

09:30 – 11:00 Plenary Talks (35min + 10min Q&A)

Chair: Dr. Quang-Minh Ha

- Prof. Dr. Chung-Piaw Teo (NUS):
  Picking winners: Diversification through portfolio optimization
- Dr. Thomas Schlechte (LBW Optimization GmbH):
  Game of Trains - Recent Success Stories of Railway Optimization

11:00 – 11:30 Coffee Break

11:30 – 13:00 Session 1 (18min + 4min Q&A)

Chair: Prof. Dr. Satoshi Ito

- Dr. Dabin Wang (JP Morgan):
  Blockchain & DeFi Security
- Prof. Dr. Hiroshige Dan (Kansai Univ.):
  Yet Another Implementation of Automatic Differentiation Software: Utilization of Spatial Locality
- Prof. Dr. João Pedroso (Univ. of Porto):
  Improving Kidney Exchange Programs
- Dr. Thi Thai Le (ZIB):
  Problems of fluid interface instabilities in Energy Systems

13:00 – 14:00 Lunch

14:00 – 15:40 Session 2 (13min + 3min Q&A)

Chair: Prof. Dr. Koji Nakano

- Dr. João Doriguello (NUS):
  Quantum and quantum-inspired algorithms for k-means and Lasso path problems
- Dr. Chao Li (RIKEN):
  Discovering Optimal Tensor Network Architectures: An Exploration of Tensor Network Structure Search (TN-SS)
- Dr. Patrick Gelß (ZIB):
  Fredholm integral equations for the training of shallow neural networks
- Dr. Qibin Zhao
  Efficient machine learning with tensor networks
- Dr. Piang-or Loahavilai (Railway Thailand):
  Current situation of transportation networks in Thailand
- Prof. Dr. Santi Charoenpornpattana (Railway Thailand):
  The agenda for developing rail traffic in Thailand

15:40 – 16:10 Coffee Break

16:10 – 17:30   Session 3 (13min + 3min Q&A)

Chair: Prof. Dr. Hiroshige Dan

- Keiichiro Yamamura (IMI):

  Diversified Adversarial Attacks based on Conjugate Gradient Method

- Issa Oe (IMI):

  Improvement of black-box adversarial attacks based on discrete optimization using Superpixel

- Dr. Zhen-Yu Zhang (RIKEN):

  Towards Continuous Adaptation in Non-stationary Environments

- Fan Zhai (ICDI Thailand)

  Influence of the construction of China – Thailand railway on logistics and economic trade between China – Yunnan and Thailand

- Ryo Kuroiwa (Univ. of Toronto)

  Domain-Independent Dynamic Programming

17:30   Closing