Biao Hu

hubiao@cau.edu.cn | http://faculty.cau.edu.cn/gxy/hb/list.htm | Haidian, Beijing, China | 0000-0002-1234-1234 |

Education

Technology University of Munich *Munich*
PhD in Computer Science Sep. 2013 - Jun. 2017
Supervised by Prof. Alois C. Knoll

Tsinghua University *Beijing*
Master in Control Science and Engineering Sep. 2010 - Jun. 2013
Supervised by Prof. Mingguo Zhao

Harbin University of Munich *Harbin*
Bachelor in Control Science and Engineering Sep. 2006 - Jun. 2010

Work Experience

College of Engineering, China Agricultural University *Beijing*
Associate Professor Sep. 2021 - Now

College of Information Science and Technology, Beijing University of Chemical Technology *Beijing*
Associate Professor Nov. 2017 - Sep. 2021

fortiss GmbH *Munich*
Researcher Jan. 2017 - Sep. 2017

Research Projects

Research on a Brain-Inspired Heterogeneous Computing Platform and Computation Performance Optimization *Beijing*
Fund by Ministry of Science and Technology of China Dec. 2021 - Nov. 2026

Research on Software Function Scheduling for Automobiles under Hybrid Critical Requirements *Beijing*
Fund by National Natural Science Foundation of China Jan. 2019 - Dec. 2021

Research on Autonomous Operation of Heterogeneous Warehouse Logistics Robot Clusters *Beijing*
Fund by National Natural Science Foundation of China Jan. 2019 - Dec. 2021

Development of Inspection and Detection Robots based on Global Environmental Perception and Multi-Source Information Fusion *Beijing*
Fund by Ministry of Science and Technology of China Dec. 2019 - Nov. 2022

Research on Online Load Prediction Mechanism and Adaptive Scheduling Algorithm for Hybrid Critical Systems *Beijing*
Fund by Beijing University of Chemical Technology Jan. 2018 - Dec. 2021

Awards and Honors

Dec. 2020	**Honorary Title**: “Excellent Employee of the Automation Department, Beijing University of Chemical Technology ”	*Beijing*
Dec. 2020	**Honorary Title**: “Young Outstanding Technology Paper Award, Shanghai Artificial Intelligence Society ”	*Shanghai*
Dec. 2020	**Honorary Title**: “Best Paper Award at ICRRI2020 Conference”	*Fushun*
Dec. 2018	**Honorary Title**: “Excellent Employee of the Automation Department, Beijing University of Chemical Technology ”	*Beijing*
Sep. 2016	**Scholarship**: “ Scholarship to Attend Top Conferences, Technical University of Munich ”	*Munich*
Feb. 2016	**Scholarship**: “ Scholarship for Studying Abroad at Renowned Universities, Technical University of Munich ”	*Munich*
Nov. 2014	**Honorary Title**: “ First Place in TUM Kick Off Seminar Presentation, Technical University of Munich ”	*Munich*
June. 2012	**Honorary Title**: “ Second Place in RoboCup Adult League, RoboCup World Robot Soccer Championship ”	*Munich*

Volunteer Services

Journal of Circuits Systems and Computers — *Beijing*
Handling Editor — July. 2017 - Present

National Conference on Software and Applications — *Hangzhou*
Program Committee — June 2016 - July 2017

2019 IEEE International Conference on Robotics and Biomimetics — *Kunming*
Program Committee — Aug. 2019 - Oct. 2019

IEEE International Conference on Emerging Technologies and Factory Automation 2020 — *Vienna*
Program Committee — Nov. 2019 - Aug. 2020

IEEE International Conference on Systems, Man, and Cybernetics 2022 — *Prague*
Associate Editor — May 2022 - Oct. 2022

IEEE International Conference on Systems, Man, and Cybernetics 2023 — *Hawaii*
Associate Editor — May 2023 - Present

Publications

Journal Paper

[1] **Biao Hu**, Xincheng Yang, Mingguo Zhao, "Energy-Minimized Scheduling of Intermittent Real-Time Tasks in a CPU-GPU Cloud Computing Platform," *IEEE Transactions on Parallel and Distributed Systems*, vo. 34, no. 8, pp. 2391-2402, 2023.

[2] **Biao Hu**, Yinbin Shi, Gang Chen, Zhengcai Cao, MengChu Zhou, "Workload-Aware Scheduling of Real-Time Jobs in Cloud Computing to Minimize Energy Consumption," *IEEE Internet of Things Journal*, 2023, DOI: 10.1109/JIOT.2023.3286390.

[3] **Biao Hu**, Xincheng Yang, Mingguo Zhao, "Online Energy-Efficient Scheduling of DAG Tasks on Heterogeneous Embedded Platforms," *Journal of Systems Architecture*, vo. 140, pp. 102894, 2023.

[4] **Biao Hu**, Zhilei Yan, Mingguo Zhao, "Workload-Aware Scheduling of Multiple-Criticality Real-Time Applications in Vehicular Edge Computing System," *IEEE Transactions on Industrial Informatics*, 2023, DOI:10.1109/TII.2022.3231420.

[5] **Biao Hu**, Yinbin Shi, Zhengcai Cao, Mengchu Zhou, "A Hybrid Scheduling Framework for Mixed Real-Time Tasks in an Automotive System With Vehicular Network," *IEEE Transactions on Cloud Computing*, 2022, DOI:10.1109/TCC.2022.3194713, DOI: 10.1109/TCC.2022.3194713.

[6] **Biao Hu**, Yinbin Shi, Zhengcai Cao, "Adaptive Energy-Minimized Scheduling of Real-Time Applications in Vehicular Edge Computing," *IEEE Transactions on Industrial Informatics*, vo. 19, no. 5, pp. 6895-6906, 2023.

[7] **Biao Hu**, Zhengcai Cao, Mengchu Zhou, "An Efficient RRT-Based Framework for Planning Short and Smooth Wheeled Robot Motion Under Kinodynamic Constraints," *IEEE Transactions on Industrial Electronics*, vo. 68, no. 4, pp. 3292-3302, 2020.

[8] **Biao Hu**, Shengjie. Xu, Zhengcai. Cao, Mengchu Zhou, "Safety-Guaranteed and Development Cost-Minimized Scheduling of DAG Functionality in an Automotive System," *IEEE Transactions on Intelligent Transportation Systems*, vo. 23, no. 4, pp. 3074-3086, 2022.

[9] **Biao Hu**, Zhengcai Cao, Mengchu Zhou, "Scheduling Real-Time Parallel Applications in Cloud to Minimize Energy Consumption," *IEEE Transactions on Cloud Computing*, vo. 10, no. 1, pp. 662-674.(link) 2022.

[10] **Biao Hu**, Zhengcai Cao, "Minimizing Resource Consumption Cost of DAG Applications With Reliability Requirement on Heterogeneous Processor Systems," *IEEE Transactions on Industrial Informatics*, vol. 16, no. 12, pp. 7437-7447, 2020.

[11] **Biao Hu**, Zhengcai Cao, Mengchu Zhou, "Energy-Minimized Scheduling of Real-Time Parallel Workflows on Heterogeneous Distributed Computing Systems," *IEEE Transactions on Services Computing*, vol. 15, no. 5, pp. 2766-2779, 2020.

[12] **Biao Hu**, Lothar Thiele, Pengcheng Huang, Kai Huang, Christoph Griesbeck, Alois Knoll, "FFOB: efficient online mode-switch procrastination in mixed-criticality systems," *Real-Time Systems*, vol. 55, pp. 417-513, 2019.

[13] **Biao Hu**, Gang Chen, Kai Huang, "Semi-Slack Scheduling Arbitrary Activation Patterns in Mixed-Criticality Systems," *IEEE Access*, vol. 6, pp. 68507-68524, 2018.

[14] Zhengcai Cao, Lijie Zhou, **Biao Hu***, Chengran Lin, "An Adaptive Scheduling Algorithm for Dynamic Jobs for Dealing with the Flexible Job Shop Scheduling Problem," *Business & Information Systems Engineering*, vol. 61, pp. 299-309, 2019.

[15] **Biao Hu**, Kai Huang, Gang Chen, Long Cheng, Alois C. Knoll. "Evaluation and Improvements of Runtime Monitoring Methods for Real-Time Event Streams," *ACM Transactions Embedded Computing Systems*, vol. 15, no.3, pp. 56:1-56:26, 2016.

[16] **Biao Hu**, Kai Huang, Gang Chen, Long Cheng, Alois C. Knoll. "Adaptive Workload Management in Mixed-Criticality Systems, " *ACM Transactions Embedded Computing Systems*, vol. 16, no. 1, pp. 14:1-14:27, 2016.

[17] Zhengcai Cao, Xiaowen Xu, **Biao Hu***, Meng Zhou, Qinglin Li. "Real-time gesture recognition based on feature recalibration network with multi-scale information," *Neurocomputing*, no. 347, pp. 119-130, 2019.

[18] Kai Huang, **Biao Hu***, Long Chen, Alois C. Knoll, Zhihua Wang. "Adas on Cots with OpenCL: A Case Study with Lane Detection," *IEEE Transactions on Computers*, vol. 67, no. 4, pp. 559-565, 2018.

[19] **Biao Hu**, Kai Huang, Gang Chen, Long Cheng, Dongkun Han, Alois C. Knoll. "Schedulability Analysis Towards Arbitrarily Activated Tasks in Mixed-Criticality Systems," *Journal of Circuits, Systems, and Computers*, vol. 26, no. 10, pp. 1750159:1-1750159:31, 2017.

[20] **Biao Hu**, Uzair Sharif, Rajat Koner, Guang Chen, Kai Huang, Feihu Zhang, Walter Stechele, Alois C. Knoll. "Random Finite Set Based Bayesian Filtering with OpenCL in a Heterogeneous Platform," *Sensors*, vol. 17, no. 4, pp. 843, 2017.

Conference Paper

[1] **Biao Hu**, Ruilin Yang, "A KubeEdge-based Multi-Robot Collaboration Framework for Perception, Planning and Navigation, " *IEEE International Conference on Robotics and Biomimetics*, 2022, pp. 1186-1191.

[2] **Biao Hu**, Mingyue Cui, Zhengcai Cao, "A Slope-Adaptive Navigation Approach for Ground Mobile Robots, " *IEEE International Conference on Systems, Man, and Cybernetics*, 2022, pp. 610-615.

[3] **Biao Hu**, Haonan Wang, Zhengcai Cao, "Probability-based Path Planning for Multi-Robot Systems with Stochastic Behavior in a Grid Map, " *IEEE International Conference on Systems, Man, and Cybernetics*, 2021, pp. 2310-2315.

[4] **Biao Hu**, Haonan Wang, Zhengcai Cao, "Heterogeneous Multi-Robot Path Planning Based on Probabilistic Motion Model, " *IEEE International Conference on Systems, Man, and Cybernetics*, 2020, pp. 1323-1328.

[5] **Biao Hu**, Zhengcai Cao, "Minimizing Task Completion Time of Prioritized Motion Planning in Multi-Robot Systems, " *IEEE International Conference on Systems, Man and Cybernetics*, 2019, pp. 1018-1023.

[6] **Biao Hu**, Shengjie Xu, Zhengcai Cao, "Multi-Robot Path Planning for Each Robot with Several Jobs in a Single Trip, " *3rd IFAC Workshop on Cyber-Physical and Human Systems*, 2020, pp. 279-284.

[7] **Biao Hu**, Zhengcai Cao, Lijie Zhou, "Adaptive Real-Time Scheduling of Dynamic Multiple-Criticality Applications on Heterogeneous Distributed Computing Systems, " *IEEE International Conference on Automation Science and Engineering*, 2019, pp. 897-903.

[8] **Biao Hu**, Hao Chen, Zhengcai Cao, Chengran Lin, "A Self-Adaptive Cuckoo Search Algorithm for Energy Consumption Minimization Problem with Deadline Constraint, " *IEEE 16th International Conference on Automation Science and Engineering*, 2020, pp. 1479-1484.

[9] **Biao Hu**, Zhengcai Cao, "An Efficient Approach for Adaptive Online Power Management in Mixed-Criticality Systems, " *IEEE International Conference on Control and Automation*, 2019, pp. 1494-149.

[10] **Biao Hu**, Shibo Shao, Zhengcai Cao, Qing Xiao, Qunzhi Li and Chao Ma, "Learning a Faster Locomotion Gait for a Quadruped Robot with Model-Free Deep Reinforcement Learning, " *IEEE International Conference on Robotics and Biomimetics*, 2019, pp. 1097-1102.

[11] **Biao Hu**, Kai Huang. "Scheduling and shaping of complex task activations for mixed-criticality systems, " *Asia and South Pacific Design Automation Conference*, 2018, pp. 58-63.

[12] **Biao Hu**, Kai Huang, Gang Chen, Long Cheng, Alois C. Knoll. "Online workload monitoring with the feedback of actual execution time for real-time systems, " *Design, Automation and Test in Europe Conference*, 2017, pp. 764-769.

[13] **Biao Hu**, Kai Huang, Pengcheng Huang, Lothar Thiele, Alois C. Knoll. "On-the-fly fast overrun budgeting for mixed-criticality systems, " *International Conference on Embedded Software*, 2016, pp. 25:1-25:10.

[14] **Biao Hu**, Kai Huang, Gang Chen, Long Cheng, Alois C. Knoll. "Adaptive runtime shaping for mixed-criticality systems, " *International Conference on Embedded Software*, 2015, pp. 11-20.

[15] **Biao Hu**, Kai Huang, Gang Chen, Alois C. Knoll. "Evaluation of runtime monitoring methods for real-time event streams, " *Asia and South Pacific Design Automation Conference*, 2015, pp. 582-587.

[16] **Biao Hu**, Mingguo Zhao. "The optimization of spring stiffness for passive dynamic walker, " *IEEE/RSJ International Conference on Intelligent Robots and Systems*, 2012, pp.1943-1949.