Preface

It is a pleasure to welcome you to the 2023 5th International Symposium on Architecture Research Frontiers and Ecological Environment (ARFEE 2023). At this dynamic and innovative time, we were honored to invite academic elites from all over the world to discuss the latest advances and cutting-edge research in architecture and ecological environment.

ARFEE 2023 was held in Changsha, China from December 22nd to 24th, 2023 (virtual event). It focused on cutting-edge issues in architecture and ecological environment engineering, and provided a platform for academia to share knowledge, exchange views and promote collaboration.

The Conference has invited renowned scholars and experts from around the world, who brought us a series of fascinating thematic presentations. These reports covered multiple aspects of architecture and ecological environment engineering, including but not limited to hot topics such as New Building Material, Building Energy Saving Technology, Water Supply and Drainage Engineering, Waste Treatment and Recycling, Ecological Environment Restoration and Protection, etc. We believe that these reports have provided participants with insight and inspiration, and promoted research and development in related fields. In addition, it featured oral presentations and poster presentations, providing an opportunity for graduate students and young researchers to present their research findings. It was an important platform for participants to exchange and interact with each other, helping to share experiences, promote cooperation and build new partnerships.

The aim of ARFEE 2023 was to promote interdisciplinary collaboration and innovation in the fields of and related to architecture and ecological environment engineering. We believe that through the interaction and cooperation of this Conference, we have deepened our understanding of these fields, and promoted interdisciplinary integration.

Finally, we believe that the Proceedings of this Conference will be of great significance to the academic community. The Proceedings features outstanding papers from ARFEE 2023, which represents the latest research results and innovative ideas in the field. By publishing these papers, we are able to further expand the impact of our research, promote communication and collaboration among the academic community, and provide valuable references for future research.

We would like to acknowledge all those who supported and participated in ARFEE 2023. We look forward to have your active participation in future series conference of ARFEE!

The Committee of ARFEE 2023

Committee Member

Conference Chair

Prof. Baoyu Gao, Shandong University, China Prof. Ping Xiang, Central South University, China

Technical Program Committee Chair

Prof. Gordon Huang, University of Regina, Canada

Prof. Danhui Dan, Tongji University, China

Prof. Zheng Chen, Guangxi University, China

Organizing Committee Chair

Prof. Xueying Liu, Zhejiang University of Water Resources and Electric Power, China

Publication Chair

Prof. Abdul-Sattar Nizami, Government College University, Pakistan

Prof. Bo Wang, Chang'an University, China

Technical Program Committee

Assoc. Prof. Jianhui Hu, Shanghai Jiao Tong University, China

Prof. Keqiang Zhang, Xi'an Traffic Engineering Institute, China

Prof. XinE Yan, Xi'an Traffic Engineering Institute, China

Yixin Zhang, Xi'an Traffic Engineering Institute, China

Prof. Guangxiu Fang, Yanbian University, China

Prof. Shaosen Wang, Xiamen University, China

Prof. Qian Fang, Beijing Jiaotong University, China

Prof. Caiyun Qian, Nanjing Tech University, China

Prof. Hongguang Liu, Shihezi University, China

Prof. Congqi Fang, Shanghai Jiao Tong University, China

Prof. Hua Wang, China Coal Research Institute, China

Prof. Rui Neves, Polytechnic Institute of Setubal, Portugal

Prof. Darve, University Grenoble Alpes, France

Prof. Antonio Caggiano, Darmstadt University of Technology/CONICET, Germany / University of Buenos Aires, Argentina

Prof. Feng Lan, Xi'an University of Architecture and Technology, China

Prof. Xianguo Wu, Huazhong University of Science and Technology, China

Prof. Tao Zhu, China University of Mining and Technology (Beijing), China

Dr. Hachemi Samya, University of Biskra, Algeria

Assis. Prof. Behrouz Behnam, Amirkabir University of Technology, Iran

Prof. James Yang, Coventry University, UK

Dr. F.Pacheco Torgal, University of Minho, Portugal

Prof. Xia Huo, Jinan University, China

Prof. Yuning Miao, Guanxi Minzu University, China

Prof. Ping Xiang, Central South University, China

Prof. Ming Li, Dalian University of Technology, China

Assoc. Prof. Hongxu Peng, Fuzhou University, China

Dr. Thota Sivasankar, NIIT University, India

Prof. Guoyun Lu, Taiyuan University of Technology, China

Prof. Guoping Xiong, Southeast University, China

Assoc. Prof. Xin Wu, Fuzhou University, China

Prof. Ying Fu, University of Jinan, China

Prof. Bo Wang, Chang'an University, China

Assoc. Prof. Rui Guo, Southwest Jiaotong University, China

Assoc. Prof. Pingping Zhang, South China Agricultural University, China

Prof. Jorge de Brito, University of Lisbon, Portugal