The 1st International Workshop on Artificial Intelligence for Real-world Challenges (AI4RWC)

Heading

Title of the workshop/special-session and acronym:

The 1st International Workshop on Artificial Intelligence for Real-world Challenges (AI4RWC)

Proposed duration: Half-day

Workshop/special session (co-)chair(s) name, affiliation and e-mail address:

- Daqian Shi, Queen Mary University of London, UK, Email: d.shi@qmul.ac.uk
- Xiaolei Diao, Queen Mary University of London, UK, Email: x.diao@qmul.ac.uk
- Jishizhan Chen, University College London, UK, Email: jishizhan.chen@ucl.ac.uk

Short CV of (co-)chair(s) including past experience in organizing workshops/special session and/or related events:

- Dr. Daqian Shi is a post-doc research associate at Digital Environment Research Institute (DERI), Queen Mary University of London. His research interests focus on deep learning, multi-modality learning, knowledge representation, and AI for healthcare. He has published more than 30 papers in top-tier journals and conferences with 600+ citations. He has co-led a special issue named Computational Mathematics in Modern Medicine at the Applied and Computational Mathematics journal.

- Dr. Xiaolei Diao is a post-doc researcher at the School of Electronic Engineering and Computer Science, Queen Mary University of London. Her research interests focus on multi-modality learning, few-shot learning, data-centric AI, and AI for science. She has published more than 20 papers in top-tier journals and conferences in the AI field. She has led the knowdive seminars at the University of Trento from 2021-2024.
- Dr. Jishizhan Chen is a Research Fellow at UCL Mechanical Engineering and a qualified orthopaedist. His research focuses on advanced imaging, biomimetic materials and biomechanics. He has published 23 papers and received multiple international awards, including the SICOT Best Basic Science Paper. Dr Chen is a Member of SICOT Research Academy, coordinating the organisation of the annual SICOT World Orthopaedics Congress and other international meetings. He co-led interdisciplinary workshops and events involving clinicians and researchers.

Introduction

Abstract: one paragraph describing the workshop/special-session purpose (max. 200 words)

Artificial intelligence is advancing rapidly and drawing wide attention. However, bringing AI into the real world remains a major challenge. Real-world data (RWD) typically exhibits multi-source heterogeneity, scarcity, and imbalance, usually with missingness, noise, biases, and limited labels, and constraints from privacy, compliance, and operations. These realities make reliability and maintainability central concerns. The First International Workshop on Artificial Intelligence for Real-world Challenges takes RWD as its starting point and focuses on how to build, deploy, monitor, and continually improve AI systems in real-world scenarios. We welcome diverse approaches to these challenges, including few-/zero-shot learning, data-centric AI, continual learning, etc. We also invite knowledge-driven methods, as well as retrieval-augmented generation and large language models (LLMs), and agent theory and applications that operate under real-world constraints. The workshop provides an interdisciplinary forum for researchers and practitioners worldwide to share cutting-edge research, innovative methods, and practical experience. Through keynotes, technical presentations, and panel discussions, it will foster interaction between AI researchers and domain experts, cultivate long-term collaborations, and inspire new research directions toward sustainable, impactful AI in real environments.

Scope and topics of the workshop/special session:

The workshop welcomes contributions that address interdisciplinary and real-world challenges using Artificial Intelligence. We encourage research that bridges multiple domains, integrates diverse data sources, and operates effectively under real-world scenarios. Topics of interest include, but are not limited to:

- Few-shot and zero-shot learning for real-world data
- Transfer learning and domain adaptation in real-world scenarios
- Bias detection, concept drift, data drift, and shift-robust methods
- AI Agent theory and applications
- Knowledge-enhanced AI or multimodal learning for domain applications
- Data-centric AI for noisy, imbalanced, and heterogeneous datasets
- LLMs for real-world challenges and cross-domain collaboration
- Retrieval-augmented generation and grounding methods
- Web-enabled AI systems and intelligent agents for cross-domain collaboration
- AI applications in interdisciplinary, including healthcare, environment and earth system, materials, cultural heritage, etc.
- Platforms and tools for inclusive, diversity-aware, and human-centric AI
- Case studies of AI deployment and impact assessment in real-world scenarios

Motivation and Rationale

Why the workshop/special session is related to WI-IAT 2025

The theme of AI4RWC 2025 aligns closely with WI-IAT's emphasis on Web Intelligence and Agent Technology. Building on the original vision, we explicitly take real-world data (RWD) as a starting point and highlight methods that operate under real-world constraints. In addition to cross-domain applications, the workshop welcomes agent theory and applications, knowledge-enhanced approaches, and retrieval-augmented / tool-using LLMs, where appropriate, to support web-enabled collaboration and decision-making across domains. This strengthens the connection to WI-IAT's core tracks while preserving the interdisciplinary focus originally outlined.

Why the topic is timely and important

AI for interdisciplinary research is rapidly evolving as global challenges demand reliable and maintainable solutions beyond laboratory settings. Real-world deployments must contend with multi-source heterogeneity, scarcity/imbalance, missingness, noise, bias, and drift, as well as privacy, compliance, and operational constraints. Recent advances, such as few-/zero-shot learning, data-centric AI, and continual learning, offer practical paths to make AI systems

robust under these conditions, complementing knowledge-driven methods and modern RAG/LLM toolchains.

Why the workshop/special session may attract a significant number of submissions of good quality

The workshop encourages both cutting-edge AI techniques and impactful applications, appealing to AI researchers and domain scientists alike. The workshop's broad scope, covering advanced AI methodologies, solutions for real-world challenges, interdisciplinary applications, and emerging technologies such as LLMs and AIGC, ensures strong relevance to both academic and industrial researchers. It offers a venue for presenting not only technical innovations but also domain-specific use cases with real-world impact, thereby appealing to submissions from diverse research communities.

Why the workshop/special session may attract a large number of attendees, in addition to the authors

The real-world challenges focus continues to engage AI scientists, domain experts, industry professionals, and policymakers who seek operationally viable AI. The workshop's structure, including keynote talks, paper presentations, and panel discussions, will encourage active participation and discussion among researchers from multiple disciplines, making it attractive to attendees beyond the contributing authors.

Why the workshop/special session differs from others

While many workshops focus on domain-specific or narrow technical areas, AI4IRWC 2025 uniquely emphasizes the integration of AI into complex, real-world, and cross-domain scenarios. It explicitly addresses data scarcity and imbalance, aligning with the connected-world paradigm of WI-IAT. The combination of interdisciplinary scope, real-world constraints, and emerging AI technologies sets it apart from other events.

Related workshops and conferences of similar topics

Relevant events include AAAI 2025 workshop "MARW: Multi-Agent AI in the Real-World Workshop", ECAI 2025 workshop "AI-based Planning for Complex Real-World Applications (CAIPI25)", NeurIPS 2025 workshop "Imageomics: Discovering Biological Knowledge from Images Using AI", and previous WI-IAT workshops including "The International Workshop on the Practical Applications of Artificial Intelligence in Tackling Real-World" and "The International Workshop on Artificial Intelligence for Health Informatics".

Workshop /Special Session Details

Tentative committee lists (organizers, program committee, etc.)

Organizers:

- Daqian Shi, Queen Mary University of London, UK
- Xiaolei Diao, Queen Mary University of London, UK
- Jishizhan Chen, University College London, UK

Program Committee:

- Prof. Cedric John, Queen Mary University of London, UK
- Prof. Greg Slabaugh, Queen Mary University of London, UK
- Prof. Fausto Giunchiglia, University of Trento, Italy
- Prof. Massimo Poesio, Queen Mary University of London, UK
- Prof. Honghan Wu, University of Glasgow, UK
- Prof. Hao Xu, Jilin University, China
- Dr. Jinke Chang, University of Oxford, UK
- Dr. Linglong Qian, King's Collage London, UK
- Dr. Lida Shi, Jilin University, China

Expected number of participants: 20-30

Expected number of submissions: 8-12

A short list of potential authors that are expected to submit papers to the workshop/special session

Potential authors:

We expect contributions from leading researchers in the fields of Artificial Intelligence, interdisciplinary applications, and real-world data challenges, including but not limited to:

- Prof. Jerry Jialie Shen, City St George's, University of London, UK (AI for Health Informatics, WI-IAT community)
- Prof. Chuntao Li, Jilin University, China (AI for Ancient Characters)
- Dr. Haifa AlSalmi, Queen Mary University of London, UK (AI for Geoscience)
- Dr. Matteo Busso, University of Trento, Italy (Human-centric AI)
- Dr. Andrea Bontempelli, University of Trento, Italy (Human-centric AI)
- Dr. Rui Song, Jilin University, China (AI for Cultural Heritage)
- Dr. Xu Chen, Queen Mary University of London, UK (Cardiac AI, Digital Twins)
- Dr. Xiaoyu Zheng, Queen Mary University of London, UK (AI for Musculoskeletal Conditions)
- Dr. Mayukh Bagchi, University of Trento, Italy (Knowledge-enhanced AI)

- Jinge Wu, University College London, UK (AI for Healthcare)
- Bo Peng, University College London, UK (AI for Healthcare)
- Zhihan Zhou, Jilin University, China (AI for Ancient Characters)
- Juexi Shao, Queen Mary University of London, UK (Games and AI)
- Yuan Liang, Queen Mary University of London, UK (AI for Bioinformatics)

In addition to these scholars, we anticipate participation from their research teams, which include postdoctoral researchers, PhD candidates, and graduate students actively working on relevant topics. We will also invited industrial researchers and teams from Microsoft Research, Tencent AI Lab, Huawei Noah's Ark Lab, and Google DeepMind interested in LLM and AIGC applications in real-world scenarios.

A draft call for papers (max 1 page)

Call For Papers

Topics of interest

Artificial intelligence is advancing rapidly and drawing wide attention. However, bringing AI into the real world remains a major challenge. Real-world data (RWD) typically exhibits multi-source heterogeneity, scarcity, and imbalance, usually with missingness, noise, biases, and limited labels, and constraints from privacy, compliance, and operations. These realities make reliability and maintainability central concerns. The First International Workshop on Artificial Intelligence for Real-world Challenges takes RWD as its starting point and focuses on how to build, deploy, monitor, and continually improve AI systems in real-world scenarios. We welcome diverse approaches to these challenges, including few-/zero-shot learning, data-centric AI, continual learning, etc. We also invite knowledge-driven methods, as well as retrieval-augmented generation and large language models (LLMs), and agent theory and applications that operate under real-world constraints. The workshop provides an interdisciplinary forum for researchers and practitioners worldwide to share cutting-edge research, innovative methods, and practical experience. Through keynotes, technical presentations, and panel discussions, it will foster interaction between AI researchers and domain experts, cultivate long-term collaborations, and inspire new research directions toward sustainable, impactful AI in real environments.

We invite submissions of original research papers, case studies, and surveys on AI and applications for interdisciplinary and real-world challenges. Topics of interest include, but are not limited to:

- Few-shot and zero-shot learning for real-world data
- Transfer learning and domain adaptation in real-world scenarios
- Bias detection, concept drift, data drift, and shift-robust methods
- AI Agent theory and applications
- Knowledge-enhanced AI or multimodal learning for domain applications
- Data-centric AI for noisy, imbalanced, and heterogeneous datasets
- LLMs for real-world challenges and cross-domain collaboration
- Retrieval-augmented generation and grounding methods
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- Case studies of AI deployment and impact assessment in real-world scenarios

Important dates

- Submission deadline: September 20, 2025
- Notification: October 15, 2025
- Camera-ready: October 20, 2025

Instruction for submission

The workshop welcomes original, unpublished research papers and demo papers that are not under review elsewhere, including experimental research, case studies, and student research papers. Papers must be submitted electronically in standard IEEE Conference Proceedings format (max 6 pages, but you can purchase maximum 2 extra pages per accepted paper, see Article Templates). All submissions will undergo a peer-review process, coordinated by the International Program Committee. All accepted new contributions will be published in a companion volume of the IEEE WIC ACM International Conference on Web Intelligence (WI) (IEEE Xplore − Conference Table of Contents).

A description of the publicity and promotion plan

- Dissemination via WI-IAT mailing lists, AI research forums, and social media (LinkedIn, Twitter, WeChat).
- Outreach to interdisciplinary research groups and professional societies.
- Announcements through collaborators' academic networks and institutional channels.
- Direct invitations to targeted researchers, including authors from related conferences such as IJCAI, AAAI, ECAI and previous WI-IAT workshops.
- Collaboration with research networks such as WeNet, Internet of Us, and DataScientia to reach interdisciplinary audiences.

Workshop/special session format planned (keynote, expected number of presented papers, invited talks, panels, demonstrations, etc.)

The workshop will be a half-day event including:

- Keynote Speeches: 1 invited keynote talk from a leading AI researcher in interdisciplinary applications.
- Technical Paper Presentations: Approximately 8–12 accepted papers after peer review, are presented in oral sessions.
- Invited Talks: 1 invited presentation highlighting applied case studies and domain-specific insights.
- Panel Discussion: One interactive panel involving keynote speakers, industry representatives, and domain experts on "AI for Interdisciplinary and Real-world Challenges."

Tentative Internal and External Schedule (Except adjustments by the Chairs to align all workshop/special session schedules)

- **Submission deadline:** 20 September 2025
- **Review deadline:** 10 October 2025
- **Acceptance deadline:** 15 October 2025
- **Camera-ready:** 20 October 2025
- **Program ready:** 10 November 2025