

Report on Participation at the 2024 World Biomaterials Congress

About WBC 2024

The World Biomaterials Congress (WBC) is a prestigious event in the field of biomaterials, established in 1980 and held every four years. This year, the Korean Society of Biomaterials hosted the 12th WBC in Daegu, Korea. The WBC is renowned for its participation of eminent researchers and professionals, including leading researchers such as Professor Nicholas A. Peppas in the field of biomaterials, Professor Samir Mitragotri for drug delivery, and Professor Xingdong Zhang for bone regeneration. The 2024 WBC covered a broad spectrum of topics within biomaterials, reflecting the latest advancements and emerging trends in the field. Key areas of focus included hydrogel research, drug delivery systems, bionanotechnology, and the integration of artificial intelligence (AI) in biomaterials research. Notably, this congress marked the first inclusion of AI as a dedicated topic, highlighting its growing importance and potential in advancing biomaterials research.

My Participation on WBC 2024

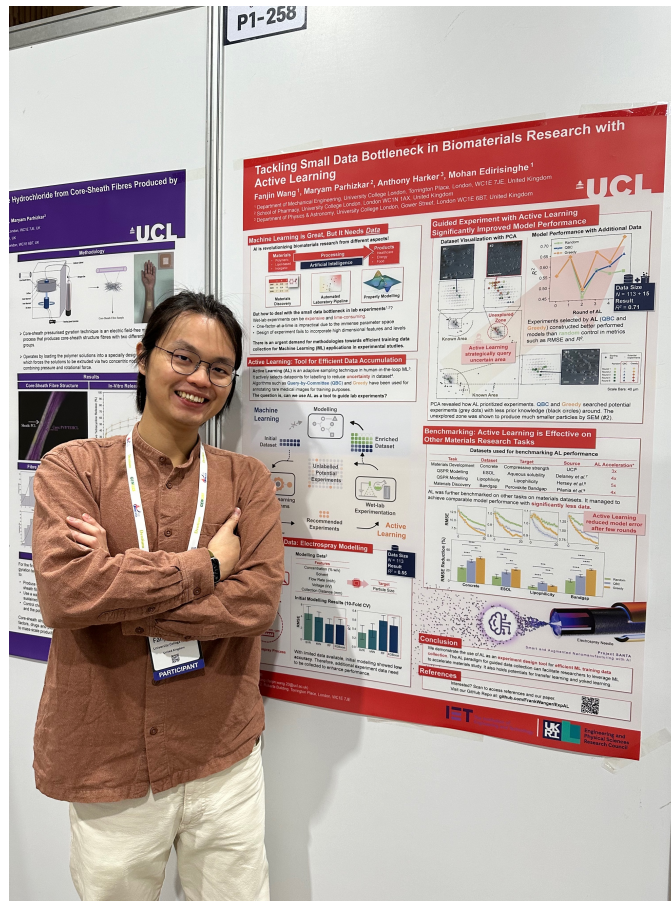
As a Ph.D. candidate in Mechanical Engineering at UCL, attending this conference was a significant milestone in my academic journey. It was an irreplaceable opportunity not only because it was the only chance to attend the WBC during my Ph.D. but also due to the critical timing in my second year of doctoral research. Additionally, the poster I presented was about my recently published research on AI applications in biomaterials, making it the perfect chance to share this work with other researchers. My research focused on efficient experiment planning to tackle the long-standing data scarcity bottleneck in the area. Using active learning, the amount of data required to build machine learning training sets could be significantly reduced. This methodological research provides critical tools for biomaterials researchers wishing to incorporate machine learning models into their research pipeline.

During my presentation, I actively introduced my research to a wide audience of biomaterials researchers. I also extended collaboration invitations to researchers from around the world who are currently suffering from insufficient training data. Research groups from China, the US, and Korea expressed interest in the active learning toolbox I developed in my research.

In addition to my participation in the poster presentation session, I attended various discussion sessions and oral presentations. The five-day conference covered a wide range of topics under the umbrella of biomaterials research. One of the keynote speakers, Professor Antonios Mikos, presented recent results on applying machine learning to predict 3D printing quality. During the Q&A session, I networked with him and gained insights into AI applications in biomaterials. Hearing his positive perspectives on this field increased my determination in my academic path. Other advanced topics, such as biomaterials for nerve regeneration, oral biologics delivery, and conductive hydrogel, also attracted me with their potential to incorporate machine learning algorithms for accelerated development.

It was a precious opportunity to get educated: respected professors shared details about the development of their research ideas in their invited talks, along with their own stories of success

and failures. Several anecdotes from their research careers encouraged my passion for academia and boosted my confidence when facing challenges in my own research projects.



IET Travel Award is Critical to My Attendance

Receiving the travel grant from the Institution of Engineering and Technology (IET) was indispensable in enabling my participation at the WBC 2024. Daegu, Korea, is a beautiful, cultural, and developed city, making it an ideal place to host international conferences. However, the geographical distance from London to Daegu made it less favorable as a researcher located in the UK. The generous help from IET made it possible for me to take part in this prestigious conference and provided the opportunity to network with peers and interact with leading researchers. The exposure to cutting-edge research, expert insights, and diverse perspectives significantly enriched my understanding of biomaterials research. Presenting my work at such a prestigious platform not only shared my research with other groups but also enhanced my skills in communication and presentation. All of these experiences contributed to my personal and professional development as a student and researcher. The networks established at the conference were invaluable, offering potential postdoctoral positions and future collaborations. The interactions and feedback received have opened new avenues for exploration and refined my research approach.

Commitment to Sustainable Travel Options

As a commitment I made when applying for the IET travel grant, I took multiple steps to ensure the sustainability of my travel. Since I had a transfer in Shanghai, China, I combined my yearly family visit with this conference visit, contributing to a reduction in greenhouse gas emissions from two 12-hour intercontinental flights. Furthermore, in Daegu, I exclusively used public transportation, including buses and local shuttle coaches from hotels to the venue. I also chose a hotel committed to sustainable development (Toyoko Inn) for my accommodation.

Conclusion

In summary, the support from IET has been instrumental in advancing my Ph.D. research and professional growth. The 2024 WBC experience has laid a strong foundation for my future work, aligning well with IET's mission to foster innovation and excellence in engineering. The insights and collaborations gained from this conference are expected to propel my research forward, contributing to the advancement of biomaterials and AI, and ultimately to the broader goal of improving healthcare and sustainability.