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**Dr Dongfang Liang**  
**Industrial Fellowships  
Scheme**

**Dr Dongfang Liang** is a lecturer in the Geotechnical and Environmental Research Group at the University of Cambridge. Between 2015 and 2016, he held a Royal Academy of Engineering Industrial Fellowship that enabled a collaborative project with Mott MacDonald to develop integrated approaches for the dynamic modelling of surface water and groundwater flow.

“I gained valuable experience of working in the industry, which helped me take part in real engineering projects, understand real engineering concerns and also become a Chartered Engineer.”

## RESEARCH

Dr Liang’s research involves gaining a better understanding of hydro-environment systems by developing tools that can analyse and measure water flow and pollutant transport. His expertise ranges from investigating phenomena such as flash floods in urban environments, to examining wave run-up and impact on coastal structures. He is also interested in how soil and water interactions can affect the stability of hydraulic structures and offshore installations.

A significant area of his research relates to understanding the risks of flooding. This is important in helping to prevent the large-scale devastation associated with floods. Dr Liang’s research in this area led him to apply for an Industrial Fellowship to collaborate with Mott MacDonald to look at the real-world applications of his hydrodynamic models.

“I was able to demonstrate the importance of coupling the surface water flow and groundwater flow in predicting flood inundation and wave run-up,” Dr Liang explains. “I also realised some of the practical constraints that limit the wide adoption of such an integrated approach.”

## IMPACT

The Fellowship provided Dr Liang with the opportunity to get to know current industrial practice in flood risk management at a world-leading civil engineering consultancy. Mott MacDonald has a high reputation in this area, making it the ideal environment for Dr Liang to use his research within real-life engineering projects.

“The collaboration allowed me to incorporate my latest research outcomes into industrial computational tools for analysing large-scale environmental flows,” he explains. “This gave Mott MacDonald an edge in competing with other hydro-environment consultancies around the world.”

The collaboration with Mott MacDonald has also had an impact on Dr Liang’s teaching. After his Fellowship, he updated the syllabus of an undergraduate module on water engineering to include more up-to-date case studies, and has since observed how students have responded positively to these real-world examples. Dr Liang also supervised several final-year undergraduate and PhD projects with engineers in Mott MacDonald and will continue to do so in the future.

## PROFESSIONAL DEVELOPMENT

Strengthening the connection with industry has helped to broaden the horizons of Dr Liang’s research on pressing issues relating to water resources and water-related disasters.

## ENGINEERING INDUSTRIAL FELLOWSHIP SCHEME

The Industrial Fellowship scheme provides an invaluable opportunity for early- to mid-career academics to undertake a collaborative research project in an industrial environment. The scheme aims to strengthen the strategic relationship between the university and the industry host by providing an opportunity to establish or enhance collaborative research between the two parties and enhance the quality of teaching.