UQ Summer Research Project Description

Project title:	**Explosive spalling of cover concrete in fire**
Hours of engagement & delivery mode	For the Summer program, students will be engaged for 6 weeks only. Hours of engagement: 36 hrs per week. While on-site attendance is preferred, a hybrid arrangement combining onsite and remote working is also possible.
Description:	Explosive spalling of cover concrete in a fire event can have serious human and structural consequences. Structurally, spalling results in loss of material, reduction in section size and early exposure of the reinforcing steel to excessive temperatures. The reduced performance of affected concrete structures due to spalling can render fire design calculations inaccurate and result in significantly reduced levels of safety. The inability to predict the occurrence of spalling has thus been a critical limiting factor in the development of robust models for the response of concrete structures in fire. This project aims to critically review the spalling process, possible governing mechanisms as well as reliable tests that allow to assess such possible governing mechanisms. The project is part of a larger project funded by the Australian Research Council - Successful applicants will thus have opportunity to interact with other team members, including international leading researchers.
Expected outcomes and deliverables:	Successful applicants will gain skills in systematic literature review and data collection, together with some critical analysis of the results. They may be involved in the ongoing experimental program, where appropriate. Successful applicants will be asked to produce reports or oral presentations during/at the end of their project. They will also have opportunity to contribute to an academic paper for publication.
Suitable for:	This project is open to applications from students with a background in civil engineering who have successfully completed CIVL3360 – Reinforced Concrete Design. Applicants with knowledge of fire safety engineering are strongly encouraged.
Primary Supervisor:	A.Prof Vinh Dao.
Further info:	For further information, contact A.Prof Vinh Dao: Room 49-540 Email: v.dao@uq.edu.au.

UQ Summer Research Project Description

Project title:	**Resilient Port Infrastructure**
Hours of engagement & delivery mode	For the Summer program, students will be engaged for 6 weeks only. Hours of engagement will be 36 hrs per week. While on-site attendance is preferred, a hybrid arrangement combining onsite and remote working is also possible.
Description:	Transitioning ports infrastructure requires an understanding of the systems which form the industry, determining how we plan, design, build, operate, and enhance resilience. The Sustainable Infrastructure Research Hub at The University of Queensland and North Queensland Bulk Ports Corporation are cooperating to develop sustainable and resilient port infrastructure strategies. This project will support to develop a toolkit that provides a baseline for energy consumption and greenhouse gas emissions of port operations utilizing the activity-based methodology recommended by the guidelines of ISO 14083. The project may include the option for some short-term offsite work in Mackay.
Expected outcomes and deliverables:	As part of the project, students will be expected to: • Assess vulnerabilities in existing port infrastructure; • Develop and propose resilience-enhancing strategies; and • Integrate digital technologies for resilience monitoring and management.
Suitable for:	The project is preferable for 3rd year students (end of 2nd year and/or 3rd year) with background and interest in environmental, geotechnical, transport or coastal engineering.
Primary Supervisor:	Dr Jurij Karlovsek & Dr Cristyn Meath
Further info:	For further information, please contact Dr Jurij Karlovsek via j.karlovsek@uq.edu.au.

UQ Summer Research Project Description

Project title:	**Hydrodynamic modelling of swash, dambreak or surf zone wave transformation.**
Hours of engagement & delivery mode	Engaged for 6 weeks only. Hours of engagement around 20-36 hrs per week by negotiation. Project will be offered through a hybrid arrangement, on campus and online study
Description:	The project will test the performance of different numerical models, e.g., SPH, SWASH or XBeach hydrodynamics models to study swash, wave runup, dam-break flows or surf zone wave transformation. Opportunities exist to analyse extensive existing data sets and to collect new data collected through experiments in the Hydraulics Laboratory.
Expected outcomes and deliverables:	The project will provide training in numerical modelling using SPH, SWASH or XBeach hydrodynamics models to study swash, wave runup, dam-break flows or surf zone wave transformation. Training and skill development in physical model testing and data collection. Students will gain skills in numerical analysis, data collection, reporting and presentation skills.
Suitable for:	This project is open to Civil Engineering students with a strong background in fluid mechanics, coastal engineering, hydraulics and with Matlab or other appropriate coding skills. 4th year or BEME students only.
Primary Supervisor:	Prof. Tom Baldock
Further info:	Contact t.baldock@uq.edu.au