Polytech network form for PhD Research Grants from the China Scholarship Council

This document describes the PhD subject and supervisor proposed by the French Polytech network of 14 university engineering schools. Please contact the PhD supervisor by email or Skype for further information regarding your application.

Supervisor information

Family name	WANTZEN
First name	Karl Matthias
Email	Karl.wantzen@uni-tours.fr
Web reference	www.karlmwantzen.de
Lab name	CNRS UMR CITERES (i.e., interdisciplinary work group on cities, territories, environment and society)
Lab web site	Citeres.univ-tours.fr
Polytech name	PolyTech Tours
University name	Université de Tours
Country	France

PhD information

Title

Ecological design of urban man-river encounter sites

Main topics regards to CSC list (3 topics at maximum)

V-10. Variation d'environnement écologique et conception écologique
Ecological variation of environment and ecological design

V-14. Changement mondial et évolution de l'environnement
World change and evolution of the environment

Required skills in science and engineering	Engineers in urban planning (skills in GIS, modelling, and design programs) and/or environmental engineering (skills in river management and ecological habitat restoration) with a good background in natural sciences (hydrology, ecology) that are also affiliated to sociological techniques (professional interviewing, evaluation of social/ cultural ecosystem services, mediation, participative planning) in the context of urban rivers.

Subject description (two pages maximum)

Worldwide, rivers are in crisis, specifically those flowing through fast-developping cities. The problem is complex and includes aspects of hydrology (floods and droughts), ecology (water quality, self-purification capacity, biodiversity, conservation), urban planning (responsabilities/collaboration of the different administrations, flood control, wastewater and rainwater management, road and park planning, etc), and human-social aspects (identitification, representativity, well-being, traditional use, social and cultural ecosystem services). Addional pressures that need to be taken into account, arise from climate change (e.g., flash flood management) and globalisation (e.g., fast growing cities, fugitive movement). Moreover, in many cities there is a current trend to re-discover water civilisations, strengthen man-river linkages (including leisure activities), the re-design of post-industrial cities, the defragmentation of the urban green infrastructure and their re-connection in linear or web-shaped « megaparks ». This trend is at the same time a risk (many cities copy-paste solutions from elsewhere) and a chance (e.g., by the demolition of obsolete buildings and the re-design of this urban space).

The RIVER CULTURE Concept (Wantzen et al. 2016, River Culture: an eco-social approach to mitigate the biological and cultural diversity crisis in riverscapes. Ecohydrology & Hydrobiology 16: 7–18 http://dx.doi.org/10.1016/j.ecohyd.2015.12.003 , a follow-up on Urban River Restoration will soon appear) senior-authored by the proponent stresses the interdependence between biological and cultural diversities. It envisages the design and implementation of « man-river encounter sites » on urban river banks, which would fulfil several functions, i.a. being a) « places to be » for the entire urban population (anti-gentrification), i.e. sites for recovery, inspiration and leisure, b) sites for the restoration of habitats for organisms (animals and plants), and for the recovery of important ecosystem functions, c) safe sites for protection against inundation (water storage and groundwater recharge in multiple-use urban floodplains), d) sites for learning from the nature by observation and environmental education, e) sites for cultural learning. The design of these sites should not be seen isolated, rather, they are embedded within a catchment perspective, the idea of green and blue infrastructure, and on knowledge exchange on regional and international levels.

The successful candidate should be acquainted with complex problem solving, and have a solid background in several fields of engineering sciences mentioned above. He/she should be able to deliver creative, but realistic proposals to bring the (often very controversially discussed) items (listed above) together, and to develop these proposals further in an evolutive, iterative process by integrating the local and regional authorities, the participating population and the representatives of NGOs and other interest groups. Apart from a good command of the technical methods, this procedure requires a high sensitivity and empathy, and a critical mind to avoid influence from lobby groups.

The thesis work should consist of two parts, first an in-depth review of the (currently booming) projects on urban waterfront/river management and design, delivering a regional approach on the specific topics in selected parts of the world. In a second approach, this knowledge should then be used for a practical proposal for two contrasting cities in an old settlement (e.g., a city in France), where not much dynamics are possible due to the heritage character of existing buildings, and a fast-developping, highly dynamic city in China. A team of co-supervisors will be appointed to help with specific scientific input. It is very important that the proposal(s) produced in the framework of this thesis will be realistic, therefore the collaboration with responsibles for urban planning of the considered cities is envisaged.

The proponent is re-elected UNESCO Chair for Rivers and Heritage (Fleuves et Patrimoine) at the PolyTech of the University of Tours. He has >25 years of experience in international cooperation in scientific research, knowledge transfer, and sustainable planning (documented in > 100 international publications) and delivers lectures in the International Master Course on Urban Planning and Sustainability and the Engingeering course on Management and Environmental planning, and he delivers the lecture on « Sustainability: global responability of engineers » for all faculties of the PolyTech. The thesis would be labelled as « under the auspices of the UNESCO Chair ».

There is an opportunity for a direct exchange with the proponent (and other experts on the topic) during the 2nd International Great River Forum in Wuhan, China, 28.-30. October 2018, where he has been invited to organise the session on « Natural and cultural heritage of Great Rivers ».