

Mário Franca

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Biography

Mário graduated as Civil Engineer in 1998 and as MSc on Hydraulics and Water Resources in 2002, both from the Technical University of Lisbon. With a doctoral degree in sciences obtained at the Ecole Polytechnique Federale de Lausanne (EPFL, Switzerland) in 2005, his domain of activity includes hydraulic processes within the river basin. Before joining IHE Delft Institute for Water Education, Mário held academic positions as Research and Teaching Associate at the EPFL, as Assistant Professor at the New University of Lisbon and at the University of Coimbra (Portugal), and as Senior Member of the Marine and Environmental Sciences Centre (Portugal). He served in many instances as consultant in hydraulic engineering and he was head of the hydraulics department in an engineering company, having participated and directed applied projects on dams, hydropower, water supply, river engineering, drainage, mining sites, emergency planning and safety of hydraulic infrastructures. He has served in several faculty commissions, in Lisbon and Lausanne, and recently he was involved in a Massive Open Online Course on Fluvial Hydraulics.

Research Summary

Mário's research focus on river hydraulics; turbulent processes in open channel flows; fluvial geomorphology and morphodynamics; density currents; and non-conventional hydropower production in supply networks. Recently he is interested also on socio-hydrology and on the global impact of hydraulic natural and built structures. He is author of several scientific publications and regularly gives invited research seminars in these fields of research.

Publications

Zordan J., Juez C., Schleiss A.J. & Franca M.J. (2018) Entrainment, transport and deposition of sediment by saline gravity currents. *Advances in Water Resources*, *accepted for publication*

Zordan J., Schleiss A.J. & Franca M.J. (2018) Structure of a dense release produced by varying initial conditions. *Environmental Fluid Mechanics*, *accepted for publication*

Adduce C. & Franca M.J. (2018) Preface to the Special Issue on Environmental Buoyancy-driven Flows, *Environmental Fluid Mechanics*, <https://doi.org/10.1007/s10652-017-9539-7>

Schwindt S., Franca M.J. & Schleiss A.J. (2018) Bottom slope influence on flow and bedload transfer through contractions, *Journal of Hydraulic Research*, *accepted for publication*

Schwindt S., Franca M.J., Reffo A. & Schleiss A.J. (2018) Sediment traps with guiding channel and hybrid check dams improve controlled sediment retention, *Natural Hazards and Earth Systems Sciences*, *accepted for publication*

Juez C., Buhmann I., Maechler G., Schleiss A.J. & Franca M.J. (2018) Transport of suspended sediments under the influence of bank macro-roughness, *Earth Surface Processes and Landforms*, 43(1), 271-284 doi: 10.1002/esp.4243

Schwindt S., Franca M.J., De Cesare G. & Schleiss A.J. (2017) Analysis of mechanical-hydraulic bedload deposition control measures, *Geomorphology*, 295, 467-479 doi: 10.1016/j.geomorph.2017.07.020

Guillen-Ludena S., Franca M.J., Alegria F., Schleiss A.J. & Cardoso A.H. (2017) Hydromorphodynamic effects of the width ratio and local tributary widening on discordant confluences, *Geomorphology*, doi: 10.1016/j.geomorph.2017.06.006

Guillen-Ludena S., Cheng Z., Constantinescu G. & Franca M.J. (2017) Hydrodynamics of mountain-river confluences and its relationship to sediment transport, *Journal of Geophysical Research - Earth Surface*, 122, doi:10.1002/2016JF004122

Pokrajac D., Venuleo S. & Franca M.J. (2017) Depth-averaged momentum equation for gravity currents with varying density: coefficient in pressure term, *Journal of Hydraulic Research*, doi: 10.1080/00221686.2017.1335245

Schwindt S., Franca M.J. & Schleiss A.J. (2017) Effects of lateral and vertical constrictions on flow in rough steep channels with bedload, *Journal of Hydraulic Engineering*, 143(2):04017052-1--12. doi: 10.1061/(ASCE)HY.1943-7900.0001389

Schleiss A.J., Franca M.J., Juez C. & De Cesare G. (2016) Reservoir Sedimentation. *Journal of Hydraulic Research*, DOI: 10.1080/00221686.2016.1225320

Battisacco E., Franca M.J. & Schleiss A.J. (2016) Sediment replenishment: influence of the geometrical configuration on the morphological evolution of channel-bed. *Water Resources Research*, DOI: 10.1002/2016WR019157

Theiler Q. & Franca M.J. (2016) Contained density currents with high volume of release. *Sedimentology*, DOI: 10.1111/sed.12295

Juez C., Battisacco E., Schleiss A.J., & Franca M.J. (2016) Assessment of the performance of numerical modeling in reproducing a replenishment of sediments in a water-worked channel. *Advances in Water Resources*, doi:10.1016/j.advwatres.2016.03.010

Guillen-Ludena S., Franca M.J., Cardoso A.H. & Schleiss A.J. (2016) Evolution of the hydromorphodynamics of mountain river confluences for varying discharge ratios and junction angles. *Geomorphology*, doi: 10.1016/j.geomorph.2015.12.006

Jafarnejad M., Franca M.J., Pfister M. & Schleiss A.J. (2016) Time-Based Failure Analysis of Compressed Riverbank Riprap. *Journal of Hydraulic Research*, DOI: 10.1080/00221686.2016.1212940

Chamoun S., Zordan J., De Cesare G. & Franca M.J. (2016) Measurement of the deposition of fine sediments in a channel bed. *Flow Measurement and Instrumentation*, DOI: 10.1016/j.flowmeasinst.2016.06.008

Ricardo A.M., Franca M.J. & Ferreira R.M.L. (2016) Turbulent flows within random arrays of rigid and emergent cylinders with varying distribution. *Journal of Hydraulic Engineering*, DOI: 10.1061/(ASCE)HY.1943-7900.0001151, 04016022

Samora I., Manso P., Franca M.J., Schleiss A.J. & Ramos H.M. (2016) Micro-hydropower production in the WSS of the city of Fribourg. *WATER*, 8, 344; doi:10.3390/w8080344

Samora I., Manso P., Franca M.J., Schleiss A.J. & Ramos H.M. (2016) Opportunity and economic feasibility of inline micro-hydropower units in water supply networks. *Journal of Water Resources Planning and Management*, DOI: 10.1061/(ASCE)WR.1943-5452.0000700, 0401605

Samora I., Hasmatuchi V., Munch-Alligne C., Franca M.J., Schleiss A.J. & Ramos H.M. (2016) Experimental characterization of a five blade tubular propeller turbine for pipe inline installation. *Renewable Energy*, <http://dx.doi.org/10.1016/j.renene.2016.04.023>

Samora I., Franca M.J., Schleiss A.J. & Ramos H.M. (2016) Simulated annealing in optimization of energy production in a water supply network. *Water Resources Management*, doi: 10.1007/s11269-016-1238-5.

Guillen-Ludena S., Franca M.J., Cardoso A.H. & Schleiss A.J. (2015) Hydro-morphodynamic evolution in a 90° movable bed discordant confluence with low discharge ratio. *Earth Surface Processes and Landforms*, doi: 10.1002/esp.3770.

Franca M.J. & Brocchini M. (2015) Turbulence in Rivers, in Pawel Rowinski & Artur Radecki-Pawlik, *Rivers Physical, Fluvial and Environmental Processes*. Springer: GeoPlanet: Earth and Planetary Sciences.

Other information

Mário is an active member of IAHR, EGU and AGU. He was part of the local organizing committees of the River Flow conferences in 2006 and 2014, in Lisbon and Lausanne respectively. He is part of the leading team of the IAHR section on Experimental Methods and Instrumentation, he is convener of sessions at EGU General Assembly and he is associate editor of Water Resources Research (AGU).

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