JOSÉ PEDRO GAMITO DE SALDANHA CALADO MATOS

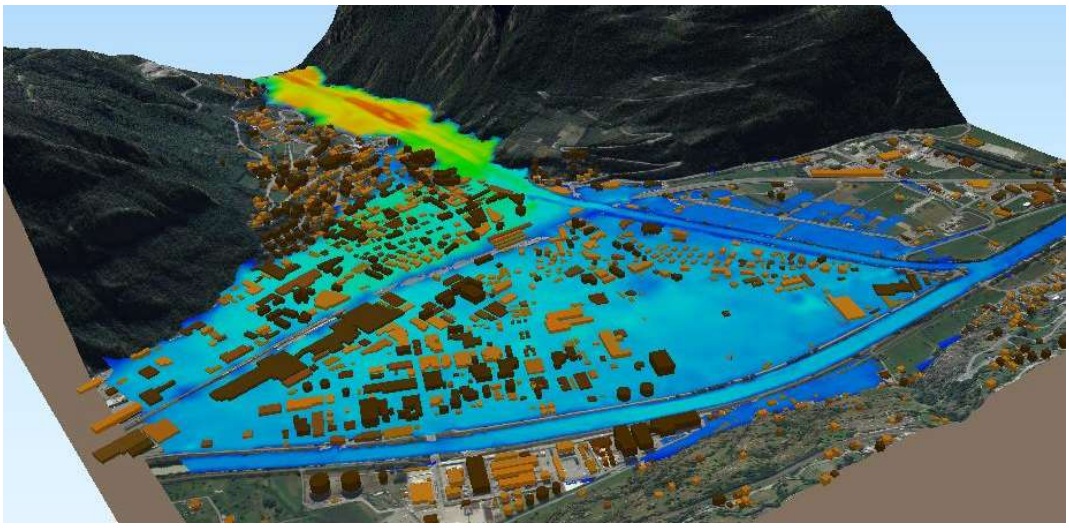
Using machine learning and efficient computing to cope with uncertainty – a hydrologist's perspective

PUBLIC PRESENTATION TO DECIVIL

2 May 2022, 14h30 - 15h30, Civil Engineering Building, IST (room V4.41)

Synopsis of CV: José Pedro Matos obtained his M.Sc. at IST in 2008. Following a brief period working as a consultant in water supply, he enrolled in the IST-EPFL joint doctoral initiative. His research, concluded in 2014, centered around machine learning and large-scale hydrology. From 2014 to 2017, José Pedro worked as a post-doc at EPFL, having participated in several projects related to uncertainty, risk, and the operation of complex hydropower systems. From 2017 to 2022, he worked in Gruner/Stucky Ltd., a Swiss company at the forefront of the design of large dams. There, he was deputy head of department (hydropower schemes), leader of the competence center for hydrology, and team leader for hydraulics and hydrology of the Rogun dam (to become the highest in the world with 335 m). In 2022, José Pedro was honored to return to IST as an Assistant Professor.

Summary of the Seminar: The seminar will be centered on the topics of risk and uncertainty as perceived by a hydrologist. Most of the presentation will be devoted to a novel machine learning algorithm for making reliable probabilistic predictions used for operational hydrologic forecasts in some of the largest dams in the World (Rogun, Cahora Bassa, and Enguri). Insights about aleatoric and epistemic uncertainty related to the failure of large dams will also be discussed, specifically how to address them computationally and what can be learned from simulation results. Finally, the seminar will cover decision-making under uncertainty.



Simulation of a possible dambreak wave overrunning an urban area in the Alps. STREST project.

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