Multi-fidelity modelling of shear concrete strength based on experiments, simulation and probabilistic approaches.

The project is focused on the multi-fidelity modelling of shear strength based on experiments. An extensive research program will be performed by a team from Lodz University of Technology (LUT). Shear test results based on beams made of normal and lightweight concrete reinforced with steel and FRP bars will be assessed by the capability of shear strength prediction on analytical models. The rule of LUT will be based on experimental tests of real-scale beams and fracture mechanics tests. The rule of the Brno University of Technology (BUT) will be an advanced shear strength simulation based on stochastic nonlinear computational mechanics and surrogate modelling.
The reliability approaches combined with soft computing techniques will be enhanced using nonlinear fracture models. Sensitivity analysis of the models will be tested and applied to the input variables in Shear analysis. The results of virtual stochastic modelling will be compared with experimental results and evaluated with respect to the model recommendations and model uncertainties. The safety formulas will be developed for application and comparison with fully probabilistic methods.