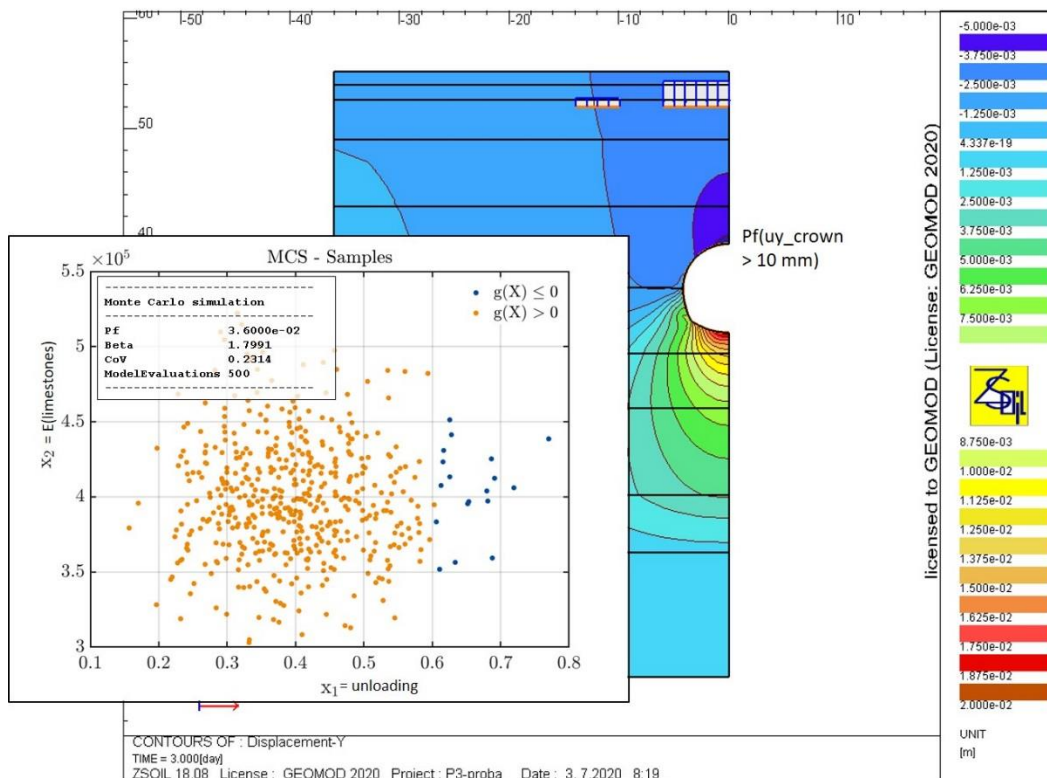# Announcement: Second edition of the short course Uncertainty Quantification, Reliability and Sensitivity Analyses applied to Geotechnics and Structures

Motivation

It is our pleasure to invite you to the second edition of this symposium. Last year, more than 60 people attended the first edition which was organized on Zoom, due to CoVid issues. We hope and believe that this year we'll be able to welcome you in person at HEIA-FR, in order to practice hands-on exercises. Anyway you will have the choice to participate physically in Fribourg, or virtually, via Zoom.

Uncertainty is present everywhere in geotechnical engineering and soil-structure interaction analysis: soil parameters are usually not known exactly, and also vary in space. Common practice consists in performing a deterministic analysis with "safety" factors. However, this technique does not give much insight into what the actual risk is. Today, a stronger integration of probabilistic approaches into safety assessment procedures and geotechnical computational mechanics in general seems appropriate.

This short course will give participants an insight into probabilistic approaches, uncertainty quantification, reliability, sensitivity analyses and associated benefits with respect to a deterministic approach. Practical applications including typical geotechnical problems (slope stability, foundation bearing capacity, anchored wall, and tunnel in urban environment) will be discussed and solved using UQLab (www.uqlab.com) and ZSOIL (www.zsoil.com).

Target audience

Civil and geotechnical engineers from the practice, researchers

Practical information

Date and time: Thursday November 18th, 2021. 09h00-17h00
Place: HEIA-FR Bd Pérolles 80 CH-1705 Fribourg, or via Zoom
Language: English, with possible French/German translations when needed
Documentation: Each participant will get a set of notes

Price

Regular: CHF 500 at HEIA-FR in Fribourg, or CHF 350 taught online via Zoom
Students: CHF 250 at HEIA-FR in Fribourg, or CHF 175 taught online via Zoom

Registration and payment

Please fill in form at https://limesurvey.hefr.ch/index.php/894782?lang=fr

Deadline: November 4th, 2021
Payment details will be sent to you by e-mail after registration, deadline: Nov. 4th, 2021

Speakers

Prof. Dr Bruno Sudret, Dr Stefano Marelli

Chair of Risk, Safety and Uncertainty Quantification
IBK - Institute of Structural Engineering, ETH Zürich

Prof. Dr Stéphane Commend

iTEC - Institut des Technologies de l'Environnement Construit

Filière de Génie Civil, HEIA Fribourg

PROGRAM

09h00-09h15	Welcome address	S. Commend
09h15-10h15	Probabilistic approaches: framework and Monte Carlo simulation	B. Sudret
10h15-10h30	Break	
10h30-11h30	Surrogate models	B. Sudret
11h30-11h45	Break	
11h45-12h45	Application examples with UQLab, including deterministic vs. reliability-based design	S. Marelli
12h45-14h00	Discussion and 60' break	
14h00-15h15	Probabilistic finite element applications 1: slope stabilities, foundation bearing capacity	S. Commend
15h15-15h45	Discussion and 15' break	
15h45-16h45	Probabilistic finite element applications 2: tunnel, sheet-pile wall	S. Commend
16h45-17h00	Discussion and short course conclusion	S. Commend