



Half-day course on Slope stability using Discontinuity Layout Optimisation (DLO)

September 5, 2024 Time: 12.30-16.00

ACE (Architecture and Civil Engineering), Chalmers University of Technology
Address: Sven Hultins gata 6, Room SB1-S393 (take stairs/Lift A on the left-hand side to level 3)

Background: Discontinuity Layout Optimisation (DLO) is a novel numerical limit analyses method that uses rigorous optimization techniques to identify the critical ultimate limit state failure mechanism for a wide range of geotechnical engineering problems. DLO is implemented in LimitState:GEO (<https://www.limitstate.com/geo>) that enables to rapidly determine the critical failure mechanism and margin of safety. As part of the PhD project of Carolina Sellin (2023) at Chalmers, funded by BIG/Trafikverket, an anisotropic version of DLO for undrained analysis, developed at the University of Sheffield by Prof. Colin Smith, was benchmarked for slope stability problems against LEM (Limit Equilibrium Method) and FE analyses (NGI-ADP model in Plaxis). Unlike in LEM, in which you need to assume the shape of the failure surface, in DLO the mode of failure and the shape of the failure surface come naturally out of the analyses similarly to FEM. Thus, in soft natural clays DLO offers an interesting alternative to the conventional LEM. LimitState:GEO has been used in the undergraduate education at Chalmers already for years, and is slowly gaining interest in industry.

Aim: The aim of the course is to give practising geotechnical engineers both some theoretical background (taught by Prof. Colin Smith, about 1 hour) on DLO, as well as hands-on tutorial experience on the use of LimitState:GEO for a typical slope stability problem in Swedish context (taught by Dr Carolina Sellin from SGI, about 2.5 hours).

Practicalities: The course is free of charge but limited to max. 25 participants (first come, first served). The participants will be sent a link on install the program a few days before the course, and are thus expected to bring a laptop with the software installed. The version installed for the course will be operational for a limited time. If there is a lot of interest, another occasion can be organised in January 2025.

Registration: <https://forms.gle/Ygq5vqzthRvsKN6G9> is open until September 1, 23:59.