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Propositions

accompanying the dissertation
DATA ASSIMILATION AND MACHINE LEARNING FOR SLOPE STABILITY ASSESSMENT
by

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1. It is important to perform data assimilation in geotechnical engineering structures to improve the predictive abilities of geotechnical models. (This dissertation)

2. Implementation of advanced constitutive models in data-assimilation schemes improves the calculation of the factor of safety. (This dissertation)

3. We need the ground truth to validate the factor of safety estimation with machine learning. Unfortunately, there are not many ground truths in the geotechnical engineering field. (This dissertation)

4. Data assimilation offers more accurate estimations than machine learning by integrating real-time observations with physics-based models, making it more effective at predicting extreme events. (This dissertation)

5. Satellite monitoring should be coupled with FEM models to allow real-time data assimilation and timely warnings, despite the needed extensive computations.

6. One can only effectively use ML models in geotechnical engineering for FoS estimation if one has sufficient data (or observations) of slope failure.

7. Machine learning in its current form will never be extensively used in geotechnical engineering due to each geotechnical structure having a unique set of materials and forcing loads.

8. There should be a section in PhD dissertations for non-acknowledgements.

9. Enforcing personal CO_2 emission tracking can enhance climate awareness and promote sustainable lifestyles.

10. International organisations should impose a progressive carbon tax on high-emitting individuals, companies, and nations to fund global climate mitigation.

These propositions are regarded as opposable and defendable, and have been approved as such by the promotors prof. dr. P. J. Vardon & prof. dr. ir. F.C. Vossepoel.