Uncertainty Analysis for Geological Drilling Data and Development of Probabilistic Soil Liquefaction Potential Mapping

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Abstract:
This research develops a stochastic model to estimate seismic soil liquefaction potential mapping using standard penetration tests. The model is developed using the database of Engineering Geological Investigation Data Bank from Central Geological Survey. Rigorous theories, including the perturbances moments method and the kriging method, are employed in the model development. The pertubances moment method is applied to the soil liquefaction evaluation model by Idriss and Boulanger(2010) to develop the probabilistic soil liquefaction potential mapping. Different numbers of uncertain variables can be considered in the model and the variability of outputs can be quantified. The developed stochastic model is compared with existing deterministic models. The results show the superior capability of the developed model.