

Publications by Iason Papaioannou

March 2023

HIGHLIGHTS

61 refereed journal papers; 2 book chapters; 56 refereed conference papers
> 2600 citations; h-index 24; i10-index 43 ([Google scholar profile](#))

JOURNAL MANUSCRIPTS IN REVIEW

Chan J., **Papaioannou I.**, Straub D. Bayesian improved cross entropy method for network reliability assessment. *Structural Safety*, in review.

Zwirgmaier K., Chan J., **Papaioannou I.**, Song J., Straub D. Hybrid Bayesian networks for reliability assessment of infrastructure systems. *ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Part A: Civil Engineering*, in review.

Kamariotis A., Sardi L., **Papaioannou I.**, Chatzi E., Straub D. On off-line and on-line Bayesian filtering for uncertainty quantification of structural deterioration. *Data-Centric Engineering*, in review.

Geyer S., **Papaioannou I.**, Straub D. Spatial modeling of concrete strength based on data. *Structural Safety*, in review.

REFEREED JOURNAL PUBLICATIONS

[J61] Kanjilal O., **Papaioannou I.**, Straub D. (2023). Bayesian updating of reliability by cross entropy-based importance sampling. *Structural Safety*, 102: 102325.

[J60] Schneider F., **Papaioannou I.**, Müller G. (2023). Sparse Bayesian learning for complex-valued rational approximations. *International Journal for Numerical Methods in Engineering*, 124: 1721-1747.

[J59] Ehre M., Flock R., Fußender M., **Papaioannou I.**, Straub D. Certified dimension reduction for Bayesian updating with the cross-entropy method. *SIAM/ASA Journal on Uncertainty Quantification*, in print.

[J58] Engel M., Kanjilal O., **Papaioannou I.**, Straub D. (2023). Bayesian updating and marginal likelihood estimation by cross entropy-based importance sampling. *Journal of Computational Physics*, 473: 111746.

[J57] Cheng K., **Papaioannou I.**, Lu Z., Zhang X., Wang Y. (2023). Rare event estimation with sequential directional importance sampling. *Structural Safety*, 100: 102291.

[J56] Stefanou G., Savvas D., Gavallas P., **Papaioannou I.** (2022). The effect of random field parameter uncertainty on the response variability of composite structures. *Composites Part C: Open Access*, 9: 100324.

- [J55] Betz W., **Papaioannou I.**, Straub D. (2022). Bayesian post-processing of Monte Carlo simulation in reliability analysis. *Reliability Engineering & System Safety*, 227: 108731.
- [J54] Chan J., **Papaioannou I.**, Straub D. (2022). An adaptive subset simulation algorithm for system reliability analysis with discontinuous limit states. *Reliability Engineering & System Safety*, 225: 108607.
- [J53] Betz W., **Papaioannou I.**, Zeh T., Hesping D., Krauss T., Straub D. (2022). Data-driven predictive maintenance for gas distribution networks. *ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Part A: Civil Engineering*, 8(2): 04022016.
- [J52] Ehre M., **Papaioannou I.**, Sudret, B., Straub D. (2022). Sequential active learning of low-dimensional model representations for reliability analysis. *SIAM Journal on Scientific Computing*, 44(3): B558-B584.
- [J51] Deng Q.-X., He J., Cao Z.-J., **Papaioannou I.**, Li D.-Q., Phoon, K.-K. (2022). Bayesian learning of Gaussian mixture model for calculating debris flow exceedance probability. *Georisk*, 16(1): 154-177.
- [J50] Wagner P.-R., Marelli S., **Papaioannou I.**, Straub D., Sudret B. (2022). Rare event estimation using stochastic spectral embedding. *Structural Safety*, 96: 102179.
- [J49] Geyer S., **Papaioannou I.**, Graham-Brady L., Straub D. (2022). The spatial averaging method for non-homogeneous random fields with application to reliability analysis. *Engineering Structures*, 253: 113761.
- [J48] Straub D., Ehre M., **Papaioannou I.** (2022). Decision-theoretic reliability sensitivity. *Reliability Engineering & System Safety*, 221: 108215.
- [J47] Wagner F., **Papaioannou I.**, Ullmann E. (2022). The ensemble Kalman filter for rare event estimation. *SIAM/ASA Journal on Uncertainty Quantification*, 10(1): 317-349.
- [J46] Schneider F., **Papaioannou I.**, Straub D., Winter C., Müller G. (2022). Bayesian parameter updating in linear structural dynamics with frequency transformed data using rational surrogate models. *Mechanical Systems and Signal Processing*, 166: 108407.
- [J45] Kanjilal O., **Papaioannou I.**, Straub D. (2022). Series system reliability of uncertain linear structures under Gaussian excitation by cross entropy-based importance sampling. *ASCE Journal of Engineering Mechanics*, 148(1): 04021136.
- [J44] Geyer S., **Papaioannou I.**, Straub D. (2021). Bayesian analysis of hierarchical random fields for material modeling. *Probabilistic Engineering Mechanics*, 66: 103167.
- [J43] Korshunova N., **Papaioannou I.**, Kollmannsberger S., Straub D., Rank E. (2021). Uncertainty quantification of microstructure variability and mechanical behavior of additively manufactured lattice structures. *Computer Methods in Applied Mechanics and Engineering*, 385: 114049.
- [J42] Uribe F., **Papaioannou I.**, Latz J., Betz W., Ullmann E., Straub D. (2021). Bayesian inference with subset simulation in varying dimensions applied to the Karhunen-Loève expansion. *International Journal for Numerical Methods in Engineering*, 122: 5100-5127.

- [J41] Wagner F., Latz J., **Papaioannou I.**, Ullmann E. (2021). Error analysis for probabilities of rare events with approximate models. *SIAM Journal on Numerical Analysis*, 59(4): 1948-1975.
- [J40] Ehre M., **Papaioannou I.**, Willcox, K. E., Straub D. (2021). Conditional reliability analysis in high dimensions based on controlled mixture importance sampling and information reuse. *Computer Methods in Applied Mechanics and Engineering*, 381: 113826.
- [J39] Kanjilal O., **Papaioannou I.**, Straub D. (2021). Cross entropy-based importance sampling for first-passage probability estimation of linear structures with parameter uncertainties. *Structural Safety*, 91: 102090.
- [J38] Uribe F., **Papaioannou I.**, Marzouk Y. M., Straub D. (2021). Cross-entropy-based importance sampling with failure-informed dimension reduction for rare event simulation. *SIAM/ASA Journal on Uncertainty Quantification*, 9(2): 818-847.
- [J37] **Papaioannou I.**, Straub D. (2021). Variance-based reliability sensitivity analysis and the FORM α -factors. *Reliability Engineering & System Safety*, 210: 107496.
- [J36] **Papaioannou I.**, Straub D. (2021). Combination line sampling for structural reliability analysis. *Structural Safety*, 88: 102025.
- [J35] Carrera B., Mok C. M., **Papaioannou I.** (2020). Efficient estimation of hydraulic conductivity heterogeneity with non-redundant measurement information. *International Journal on Geomathematics*, 11: 15.
- [J34] Tsilifis P., **Papaioannou I.**, Straub D., Nobile F. (2020). Sparse polynomial chaos expansions using variational relevance vector machines. *Journal of Computational Physics*, 416: 109498.
- [J33] Wagner F., Latz J., **Papaioannou I.**, Ullmann E. (2020). Multilevel sequential importance sampling for rare event estimation. *SIAM Journal on Scientific Computing*, 42(4): A2062-A2087.
- [J32] Savvas D., **Papaioannou I.**, Stefanou G. (2020). Bayesian identification and model comparison for random property fields derived from material microstructure. *Computer Methods in Applied Mechanics and Engineering*, 365: 113026.
- [J31] Ehre M., **Papaioannou I.**, Straub D. (2020). Global sensitivity analysis in high dimensions with PLS-PCE. *Reliability Engineering & System Safety*, 198: 106861.
- [J30] Schneider F., **Papaioannou I.**, Ehre M., Straub D. (2020). Polynomial chaos-based rational approximation in linear structural dynamics with parameter uncertainties. *Computers & Structures*, 233: 106223.
- [J29] Ehre M., **Papaioannou I.**, Straub D. (2020). A framework for global reliability sensitivity analysis in the presence of multi-uncertainty. *Reliability Engineering & System Safety*, 195: 106726.

- [J28] Uribe F., **Papaioannou I.**, Betz W., Straub D. (2020). Bayesian inference of random fields represented with the Karhunen-Loève expansion. *Computer Methods in Applied Mechanics and Engineering*, 358: 112632.
- [J27] Geyer S., **Papaioannou I.**, Kunz C., Straub D. (2020). Reliability assessment of large hydraulic structures with spatially distributed measurements. *Structure and Infrastructure Engineering*, 16(4): 599-612.
- [J26] Jiang S.H., **Papaioannou I.**, Straub D. (2020). Optimization of site exploration program for slope reliability assessment. *ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Part A: Civil Engineering*, 6(1): 04020004.
- [J25] **Papaioannou I.**, Geyer S., Straub D. (2019). Improved cross entropy-based importance sampling with a flexible mixture model. *Reliability Engineering & System Safety*, 191: 106564.
- [J24] Li L.Y., **Papaioannou I.**, Straub D. (2019). Global reliability sensitivity estimation based on failure samples. *Structural Safety*, 81: 101871.
- [J23] **Papaioannou I.**, Ehre M., Straub D. (2019). PLS-based adaptation for efficient PCE representation in high dimensions. *Journal of Computational Physics*, 387: 186-204.
- [J22] Pivovarov D., Willner K., Steinmann P., Brumme S., Müller M., Srisupattarawanit T., Ostermeyer G.-P., Henning C., Ricken T., Kastian S., Reese S., Moser D., Grasedyck L., Biehler J., Pfaller M., Wall W., Kolsche T., v. Estorff O., Gruhlke R., Eigel M., Ehre M., **Papaioannou I.**, Straub D., Leyendecker S. (2019). Challenges of order reduction techniques for problems involving polymorphic uncertainty. *GAMM-Mitteilungen*, 42(2): e201900011.
- [J21] **Papaioannou I.**, Daub M., Drieschner M., Duddeck F., Ehre M., Eichner L., Eigel M., Götz M., Graf W., Grasedyck L., Gruhlke R., Hömberg D., Kaliske M., Moser D., Petryna Y., Straub D. (2019). Assessment and design of an engineering structure with polymorphic uncertainty quantification. *GAMM-Mitteilungen*, 42(2): e201900009.
- [J20] Geyer S., **Papaioannou I.**, Straub D. (2019). Cross entropy-based importance sampling using Gaussian densities revisited. *Structural Safety*, 76: 15-27.
- [J19] Yuan J., **Papaioannou I.**, Straub D. (2019). Probabilistic failure analysis of infinite slopes under random rainfall processes and spatially random soil. *Georisk*, 13(1): 20-33.
- [J18] **Papaioannou I.**, Breitung K., Straub D. (2018). Reliability sensitivity estimation with sequential importance sampling. *Structural Safety*, 75: 24-34.
- [J17] Latz J., **Papaioannou I.**, Ullmann E. (2018). Multilevel Sequential² Monte Carlo for Bayesian inverse problems. *Journal of Computational Physics*, 368: 154-178.
- [J16] Jiang S.H., **Papaioannou I.**, Straub D. (2018). Bayesian updating of slope reliability in spatially variable soils with in-situ measurements. *Engineering Geology*, 239: 310-320.
- [J15] Betz W., Beck J. L., **Papaioannou I.**, Straub D. (2018). Bayesian inference with reliability methods without knowing the maximum of the likelihood function. *Probabilistic Engineering Mechanics*, 53: 14-22.

- [J14] Betz W., **Papaioannou I.**, Beck J. L., Straub D. (2018). Bayesian inference with subset simulation: Strategies and improvements. *Computer Methods in Applied Mechanics and Engineering*, 331: 72-93.
- [J13] Betz W., **Papaioannou I.**, Straub D. (2017). Closure to “Transitional Markov chain Monte Carlo: Observations and improvements.” *ASCE Journal of Engineering Mechanics*, 143(9): 07017002.
- [J12] Giovanis D. G., **Papaioannou I.**, Straub D., Papadopoulos V. (2017). Bayesian updating with subset simulation using artificial neural networks. *Computer Methods in Applied Mechanics and Engineering*, 319: 124-145.
- [J11] **Papaioannou I.**, Straub D. (2017). Learning soil parameters and updating geotechnical reliability estimates under spatial variability – theory and application to shallow foundations. *Georisk*, 11(1): 116-128.
- [J10] Depina I., **Papaioannou I.**, Straub D., Eiksund, G. (2017). Coupling the cross-entropy with the line sampling method for risk-based design optimization. *Structural and Multidisciplinary Optimization*, 55(5): 1589-1612.
- [J9] **Papaioannou I.**, Papadimitriou C., Straub D. (2016). Sequential importance sampling for structural reliability analysis. *Structural Safety*, 62: 66-75.
- [J8] Straub D., **Papaioannou I.**, Betz W. (2016). Bayesian analysis of rare events. *Journal of Computational Physics*, 314: 538-556.
- [J7] Betz W., **Papaioannou I.**, Straub D. (2016). Transitional Markov chain Monte Carlo: Observations and improvements. *ASCE Journal of Engineering Mechanics*, 142(5): 04016016.
- [J6] Ullmann E., **Papaioannou I.** (2015). Multilevel estimation of rare events. *SIAM/ASA Journal on Uncertainty Quantification*, 3(1): 922-953.
- [J5] **Papaioannou I.**, Betz W., Zwirgmaier K., Straub D. (2015). MCMC algorithms for subset simulation. *Probabilistic Engineering Mechanics*, 41: 89-103.
- [J4] Straub D., **Papaioannou I.** (2015). Bayesian updating with structural reliability methods. *ASCE Journal of Engineering Mechanics*, 141(3): 04014134.
- [J3] Betz W., **Papaioannou I.**, Straub D. (2014). Numerical methods for the discretization of random fields by means of the Karhunen-Loève expansion. *Computer Methods in Applied Mechanics and Engineering*, 271: 109-129.
- [J2] **Papaioannou I.**, Gao R., Rank E., Wang C. M. (2013). Stochastic hydroelastic analysis of pontoon-type very large floating structures considering directional wave spectrum. *Probabilistic Engineering Mechanics*, 33: 26-37.
- [J1] **Papaioannou I.**, Straub D. (2012). Reliability updating in geotechnical engineering including spatial variability of soil. *Computers and Geotechnics*, 42: 44-51.

[D1] Papaioannou I. (2013). *Non-intrusive finite element reliability analysis – Structural reliability analysis with “black box” finite element programs*. SVH-Verlag, Saarbrücken.

BOOK CHAPTERS

[B2] Straub D., Papaioannou I., Betz W. (2017). Reliability updating in the presence of spatial variability. In *Risk and Reliability Analysis: Theory and Applications* (ed. P. Gardoni), Springer.

[B1] Straub D., Papaioannou I. (2015). Bayesian analysis for learning and updating geotechnical parameters and models with measurements. In *Risk and Reliability in Geotechnical Engineering* (eds. K.K. Phoon and J. Y. Ching), CRC Press, Boca Raton, FL.

REPORTS

[R1] Zhang J., Boothroyd P., Calvello M., Eddleston M., Cañavate-Grimal A., Papaioannou I., Luo Z., Najjar S., Rodriguez-Marek A., Straub D., Uzielli M., Wang Y., Walter, H. (2017). Bayesian Method: A Natural Tool for Processing Geotechnical Information. TC205/TC304 Discussion Groups, ISSMGE.

REFEREED CONFERENCE PAPERS

[C56] Jiang S.-H., Liu X., Papaioannou I. (2022). Bayesian updating of slope reliability under rainfall infiltration with field observations. *Proc. 8th International Symposium on Geotechnical Safety and Risk*, Newcastle, Australia.

[C55] Zeng G., Papaioannou I., Cao Z.-J. (2022). Bayesian Gaussian mixture model learning with subset simulation. *Proc. 8th International Symposium on Geotechnical Safety and Risk*, Newcastle, Australia.

[C54] Papaioannou I., Geyer S., Straub D. (2022). Bayesian hierarchical spatial modeling of soil properties. *Proc. 8th International Symposium on Geotechnical Safety and Risk*, Newcastle, Australia.

[C53] Wagner P.-R., Papaioannou I., Marelli S., Straub D., Sudret B. (2022). Estimating failure probabilities using an adaptive variant of stochastic spectral embedding. *Proc. 13th International Conference on Structural Safety and Reliability*, Shanghai, China.

[C52] Jiang S.-H., Papaioannou I., Liu X., Huang J. (2022). Bayesian analysis of slope parameters involving multiple observations using an improved BUS approach. *Proc. 13th International Conference on Structural Safety and Reliability*, Shanghai, China.

[C51] Kanjilal O., Papaioannou I., Straub D. (2022). Structural reliability updating by cross entropy-based importance sampling. *Proc. 13th International Conference on Structural Safety and Reliability*, Shanghai, China.

[C50] Chan J.P., Papaioannou I., Straub D. (2022). Improved cross entropy-based importance sampling for network reliability assessment. *Proc. 13th International Conference on Structural Safety and Reliability*, Shanghai, China.

- [C49] Papaioannou I., Straub D. (2022). Reliability sensitivity analysis with FORM. *Proc. 13th International Conference on Structural Safety and Reliability*, Shanghai, China.
- [C48] Kamariotis A., Sardi L., Papaioannou I., Chatzi E., Straub D. (2022). A comparative assessment of online and offline Bayesian estimation of deterioration model parameters. *Proc. IMAC-XL*, Orlando, Florida, USA.
- [C47] Deng Q.-X., Cao Z.-J., Papaioannou I. (2021). Gaussian mixture analysis of univariate geotechnical data under Bayesian framework. *Proc. MLRA2021: Machine Learning & Risk Assessment in Geoengineering*, Wroclaw, Poland.
- [C46] Chan J.P., Papaioannou I., Straub D. (2021). An adaptive subset simulation algorithm for system reliability analysis with discontinuous limit states. *Proc. 18th International Probabilistic Workshop*, University of Minho, Portugal.
- [C45] Kanjilal O., Papaioannou I., Straub D. (2020). Series system reliability estimation of randomly excited uncertain linear structures by cross entropy-based importance sampling. *Proc. 7th Asian-Pacific Symposium on Structural Reliability and its Applications*, Tokyo, Japan.
- [C44] Geyer S., Papaioannou I., Straub D. (2020). Characteristic values of spatially varying material properties in existing structures. *Proc. 7th International Symposium on Life-Cycle Civil Engineering*, Shanghai, China.
- [C43] Papaioannou I., Geyer S., Straub D. (2019). Bayesian updating of foundation reliability with spatially variable measurements: A spatial averaging approach. *Proc. 7th International Symposium on Geotechnical Safety and Risk*, Taipei, Taiwan.
- [C42] Kamariotis A., Antinori G., Papaioannou I., Duddeck F. (2019). Mixed aleatory-epistemic uncertainty quantification and sensitivity analysis. *Proc. 17th International Probabilistic Workshop*, Edinburgh, UK.
- [C41] Ehre M., Papaioannou I., Straub D. (2019). Global sensitivity analysis in high dimensions with partial least squares-driven PCEs. *Proc. 13th International Conference on Applications of Statistics and Probability in Civil Engineering*, Seoul, South Korea.
- [C40] Geyer S., Papaioannou I., Kunz C., Straub D. (2019). Bayesian reliability assessment with spatially variable measurements: The spatial averaging approach. *Proc. 13th International Conference on Applications of Statistics and Probability in Civil Engineering*, Seoul, South Korea.
- [C39] Ehre M., Papaioannou I., Straub D. (2018). Efficient conditional reliability updating with sequential importance sampling. *Proceedings in Applied Mathematics and Mechanics*, 18.
- [C38] Geyer S., Papaioannou I., Kunz C., Straub D. (2018). Reliability assessment of large hydraulic structures with spatially distributed measurements. *Proc. 6th International Symposium on Life-Cycle Civil Engineering*, Ghent, Belgium.

[C37] Papaioannou I., Ehre M., Straub D. (2018). Efficient PCE representation for reliability analysis in high dimensions. *IFIP WG7.5 Working Conference on Reliability and Optimization of Structural Systems*, Zurich, Switzerland.

[C36] Ehre M., Papaioannou I., Straub D. (2018). Efficient estimation of variance-based reliability sensitivities in the presence of multi-uncertainty. *IFIP WG7.5 Working Conference on Reliability and Optimization of Structural Systems*, Zurich, Switzerland.

[C35] Jiang S.H., Papaioannou I., Li C.-G., Straub D. (2017). Integrating LEM with FEM through model correction factor method in reliability analysis of spatially variable slopes. *Proc. 15th International Conference of the International Association for Computer Methods and Advances in Geomechanics*, Wuhan, China.

[C34] Geyer S., Papaioannou I., Straub D. (2017). On the efficiency of cross entropy-based importance sampling with Gaussian densities. *Proc. 15th International Probabilistic Workshop*, Dresden, Germany.

[C33] Zwirgmaier K., Papaioannou I., Straub D. (2017). Enhancing sampling based inference in hybrid BNs for reliability assessment. *Proc. 12th International Conference on Structural Safety and Reliability* (eds. C. Bucher, B.R. Ellingwood and D.M. Frangopol), Vienna, Austria.

[C32] Papaioannou I., Straub D. (2017). Efficient sampling of non-Gaussian priors in high dimensions. *Proc. 12th International Conference on Structural Safety and Reliability* (eds. C. Bucher, B.R. Ellingwood and D.M. Frangopol), Vienna, Austria.

[C31] Uribe F., Papaioannou I., Betz W., Ullmann E., Straub D. (2017). Random fields in Bayesian inference: Effects of random field discretization. *Proc. 12th International Conference on Structural Safety and Reliability* (eds. C. Bucher, B.R. Ellingwood and D.M. Frangopol), Vienna, Austria.

[C30] Uribe F., Papaioannou I., Betz W., Latz J., Straub D. (2017). Bayesian model inference of random fields represented with the Karhunen-Loève expansion. *Proc. 2nd ECCOMAS Thematic Conference on Uncertainty Quantification in Computational Sciences and Engineering* (eds. M. Papadrakakis, V. Papadopoulos and G. Stefanou), Rhodes Island, Greece.

[C29] Papaioannou I., Straub D. (2017). How subjective are geotechnical reliability estimates? *Proc. 6th International Symposium on Geotechnical Safety and Risk/Geo-Risk 2017*, Denver, Colorado.

[C28] Jiang S.H., Papaioannou I., Straub D. (2017). Optimizing borehole locations for slope reliability assessment. *Proc. 6th International Symposium on Geotechnical Safety and Risk/Geo-Risk 2017*, Denver, Colorado.

[C27] Jiang S.H., Papaioannou I., Straub D. (2016). Bayesian updating of slope reliability in undrained clay with vane shear test data. *Proc. 14th International Probabilistic Workshop*, Ghent, Belgium.

[C26] Yuan J., **Papaioannou I.**, Straub D. (2015). Reliability analysis of infinite slopes under random rainfall events. *Proc. 5th International Symposium on Geotechnical Safety and Risk*, Rotterdam, The Netherlands.

[C25] **Papaioannou I.**, Straub D. (2015). Computing the reliability of shallow foundations with spatially distributed measurements. *Proc. 5th International Symposium on Geotechnical Safety and Risk*, Rotterdam, The Netherlands.

[C24] **Papaioannou I.**, Papadimitriou C., Straub D. (2014). Sequential importance sampling for structural reliability. *IFIP WG7.5 Working Conference on Reliability and Optimization of Structural Systems*, Huangshan, China.

[C23] Cottone G., **Papaioannou I.** (2014). Random functions with divergent integer moments: Mellin transform and polynomial chaos approaches. *Computational Stochastic Mechanics, CSM-7* (eds. G. Deodatis and P.D. Spanos), Santorini, Greece.

[C22] **Papaioannou I.**, Der Kiureghian A. (2014). EOLE for discretization of multivariate random fields. *Computational Stochastic Mechanics, CSM-7* (eds. G. Deodatis and P.D. Spanos), Santorini, Greece.

[C21] Betz W., **Papaioannou I.**, Straub D. (2014). Adaptive variant of the BUS approach to Bayesian updating. *Proc. 9th European Conference on Structural Dynamics (EURODYN)*, Porto, Portugal.

[C20] Betz W., Mok C. M., **Papaioannou I.**, Straub D. (2014). Bayesian model calibration using structural reliability methods: application to the hydrological abc model, *Proc. 2nd International Conference on Vulnerability and Risk Analysis and Management*, Liverpool, UK.

[C19] Yuan J., **Papaioannou I.**, Mok C. M., Straub D. (2013). Effect of rainfall on the reliability of an infinite slope. *Proc. 4th International Symposium on Geotechnical Safety and Risk* (eds. L.M. Zhang, Y. Wang, G. Wang and D.Q. Li), Hong Kong.

[C18] **Papaioannou I.**, Betz W., Straub D. (2013). Bayesian model updating of a tunnel in soft soil with settlement measurements. *Proc. 4th International Symposium on Geotechnical Safety and Risk* (eds. L.M. Zhang, Y. Wang, G. Wang and D.Q. Li), Hong Kong.

[C17] Betz W., **Papaioannou I.**, Straub D. (2013). Assessment of methods for the numerical solution of the Fredholm integral eigenvalue problem. *Proc. 11th International Conference on Structural Safety and Reliability* (eds. G. Deodatis, B.R. Ellingwood and D.M. Frangopol), New York, United States.

[C16] Luque J., **Papaioannou I.**, Ruess M., Schillinger D., Straub D. (2013). Probabilistic model of bone structure based on CT scan data and validation of simulation results using the Finite Cell Method. *Proc. 11th International Conference on Structural Safety and Reliability* (eds. G. Deodatis, B.R. Ellingwood and D.M. Frangopol), New York, United States.

[C15] **Papaioannou I.**, Breitung K., Straub D. (2013). Reliability sensitivity analysis with Monte Carlo methods. *Proc. 11th International Conference on Structural Safety and*

Reliability (eds. G. Deodatis, B.R. Ellingwood and D.M. Frangopol), New York, United States.

[C14] Ranjan R., Betz W., **Papaioannou I.**, Straub D. (2013). A two-step approach for reliability assessment of a tunnel in soft soil. *Proc. 3rd International Conference on Computational Methods in Tunnelling, EURO:TUN 2013*, Bochum, Germany.

[C13] Betz W., **Papaioannou I.**, Straub D. (2012). A finite cell approach for discretization of random fields. *Proc. 10th International Probabilistic Workshop*, Stuttgart, Germany.

[C12] **Papaioannou I.**, Zwirgmaier K., Straub D. (2012). Assessment of MCMC algorithms for subset simulation. *Proc. IFIP WG7.5 Working Conference on Reliability and Optimization of Structural Systems* (eds. A. Der Kiureghian and A. Hajian), Yerevan, Armenia.

[C11] Straub D., **Papaioannou I.**, Michalski A. (2012). Designing for wind actions based on time-domain analysis: Accounting for statistical uncertainty. *Proc. IFIP WG7.5 Working Conference on Reliability and Optimization of Structural Systems* (eds. A. Der Kiureghian and A. Hajian), Yerevan, Armenia.

[C10] **Papaioannou I.**, Gao R., Rank E., Wang C. M. (2012). Hydroelastic analysis of pontoon-type very large floating structures in random seas. *Proc. Fifth Asian-Pacific Symposium on Structural Reliability and its Applications* (eds. K. K. Phoon, M. Beer, S. T. Quek and S. D. Pang), Singapore.

[C9] Heidkamp H., **Papaioannou I.** (2011). Performance based design and Eurocode. *Proc. 3rd International Symposium on Geotechnical Safety and Risk* (eds. N. Vogt, B. Schuppener, D. Straub and G. Bräu), Munich, Germany.

[C8] Straub D., Lentz A., **Papaioannou I.**, Rackwitz R. (2011). Life quality index for assessing risk acceptance in geotechnical engineering. *Proc. 3rd International Symposium on Geotechnical Safety and Risk* (eds. N. Vogt, B. Schuppener, D. Straub and G. Bräu), Munich, Germany.

[C7] **Papaioannou I.**, Der Kiureghian A. (2010). Reliability-based design of slope angle considering spatial variability of soil material. *Proc. Computational Stochastic Mechanics, CSM VI* (eds. G. Deodatis and P.D. Spanos), Rhodes, Greece.

[C6] **Papaioannou I.**, Straub D. (2010). Geotechnical reliability updating using stochastic FEM. *Proc. IFIP WG7.5 Working Conference on Reliability and Optimization of Structural Systems* (eds. D. Straub), Munich, Germany.

[C5] **Papaioannou I.**, Heidkamp H., Düster A., Kollmannsberger S., Rank E., Katz C. (2009). The subset simulation applied to the reliability analysis of a nonlinear geotechnical finite element model. *Proc. 7th International Probabilistic Workshop* (eds. P. Van Gelder, D. Proske and H. Vrijling), Delft, The Netherlands.

[C4] **Papaioannou I.**, Heidkamp H., Düster A., Rank E., Katz C. (2009). Integration of reliability methods into a commercial finite element software package. *Proc. 10th International Conference on Structural Safety and Reliability* (eds. H. Furuta, D. M. Frangopol and M. Shinozuka), Osaka, Japan.

[C3] Papaioannou I., Heidkamp H., Düster A., Rank E., Katz C. (2009). Random field reliability analysis as a means for risk assessment in tunneling. *Proc. 2nd International Conference on Computational Methods in Tunnelling, EURO:TUN 2009* (eds. G. Meschke, G. Beer, J. Eberhardsteiner, D. Hartmann and M. Thewes), Bochum, Germany.

[C2] Papaioannou I., Heidkamp H., Düster A., Rank E., Katz C. (2008). Towards efficient reliability methods with industrial applications. *Proc. Ninth International Conference on Computational Structures Technology* (eds. B. H. V. Topping and M. Papadrakakis), Athens, Greece.

[C1] Papaioannou I., Fragiadakis M., Papadrakakis M. (2005). Inelastic analysis of framed structures using the fiber approach. *Proc. 5th GRACM International Congress on Computational Mechanics*, Limassol, Cyprus.

OTHER SCIENTIFIC PUBLICATIONS

[O4] Straub D., Bismut E., Depina I., Papaioannou I. (2020). Stochastische Optimierung mittels Cross Entropy: Methodik und Anwendungen. *Proc. 14. Fachtagung Baustatik – Baupraxis*, Stuttgart, Germany.

[O3] Betz W., Papaioannou I., Straub D., Heidkamp H. (2019). Zuverlässigkeitsbewertung in der Geotechnik. *Proc. Kolloquium Numerik in der Geotechnik*, Bundesanstalt für Wasserbau, Karlsruhe, Germany.

[O2] Straub D., Betz W., Papaioannou I., Teichgräber M. (2017). Was tun, wenn die Norm keine Antwort bereit hält? Chancen und Herausforderungen der probabilistischen Bemessung. *Proc. 21th Münchener Massivbau Seminar*, Munich, Germany.

[O1] Betz W., Papaioannou I., Eckl M., Heidkamp H., Straub D. (2016). Reliability analysis of a tunnel design with RELY. *SOFiSTiK Seminar 2016*, Munich, Germany.

LECTURE NOTES

[L1] Papaioannou I. (2016). *Stochastic Finite Element Methods*. TU München.