

Preface

Predicting natural disasters is extremely important in mitigating disaster related destructions. In most scenarios, it is equally difficult to predict such events due to the multitude of factors which affect the formation, propagation and spread of natural disasters.

This book specifically focuses on predicting the mean first passage time to reach a known trigger state for natural disasters modelled as dynamic random processes. An engineering perspective is followed to describe the prediction methods that particularly look at random processes which govern natural disaster dynamics that shows directional dependence and spatial inhomogeneity. Several applications are referred throughout the book including flood, cyclone and fire predictions.

Some of the material presented here can also be found in the following research publications:

1. I. Wijesundera, M.N. Halgamuge, T. Nirmalathas, and T. Nanayakkara (2012), “A geographic primitive based Bayesian framework to predict cyclone induced flooding”. *Journal of Hydrometeorology*, (2012) [1].
2. I. Wijesundera, M.N. Halgamuge, T. Nirmalathas, and T. Nanayakkara (2015), “Bias modified *MFPT* prediction for minimal intervention in robotic walkers”, [Under review].
3. I. Wijesundera, M.N. Halgamuge, T. Nirmalathas, and T. Nanayakkara (2015), “Mean first passage time for cyclone motion modelled as biased random walks”, [Under review].
4. I. Wijesundera, M.N. Halgamuge, T. Nirmalathas, and T. Nanayakkara (2015), “*MFPT* calculation for random walks in inhomogeneous networks”, [Under review].
5. I. Wijesundera (2015), “Estimation of mean first passage time (MFPT) in naturally biased inhomogeneous environments”, [PhD Thesis, The University of Melbourne, Australia, 2015] [2].

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References

1. Wijesundera I, Halgamuge MN, Nirmalathas T, Nanayakkara T (2013) Ageographic primitive-based bayesian framework to predict cyclone-inducedflooding*. J Hydrometeorol 14(2):505–523
2. Wijesundera I H (2015) Estimation of mean first passage time (MFPT) in naturally biased inhomogeneous environments. PhD Thesis

Natural Disasters, When Will They Reach Me?

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