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Estimating Failure Probabilities

[Holger Drees](#), [Laurens de Haan](#)

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In risk management often the probability must be estimated that a random vector falls into an extreme failure set. In the framework of bivariate extreme value theory, we construct an estimator for such failure probabilities and analyze its asymptotic properties under natural conditions. It turns out that the estimation error is mainly determined by the accuracy of the statistical analysis of the marginal distributions. Moreover, we establish confidence intervals and briefly discuss generalizations to higher dimensions and issues arising in practical applications as well.

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