# **Noise-Contrastive Estimation for Multivariate Point Processes**

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MLE vs. NCE (theorems and analys		
	MLE	NCE
consistent?	yes	yes theorem-
sample-efficient?	yes	(yes) theorem
sampling for integration noise		
fewer func evals?		yes
lower runtime?	theect.	yes
better learning cu	rve?	yes



## Noise events drawn from a known and cheaper model

### Coarse-to-Fine Noise Distribution Draw noise conditioned on true history log-likelihood coarse event type (fine) event type -20 -40 ø ¦1-(70+15)dt -60 -80 -100-120--140 0.0 0.5



