

# The Montecarlo method

$F$  ← Fully specified probabilistic model

e.g.  $n$  iid  $N(\mu, \sigma^2)$  random variables



$$\mathbf{X}_1 = (x_{11}, \dots, x_{1n}) \mapsto U(\mathbf{X}_1) = u_1$$

$$\mathbf{X}_2 = (x_{21}, \dots, x_{2n}) \mapsto U(\mathbf{X}_2) = u_2$$

⋮

$$\mathbf{X}_m = (x_{m1}, \dots, x_{mn}) \mapsto U(\mathbf{X}_m) = u_m$$

“Large”  
sample of  $m$   
independent  
(or not)  $u_i$   
values

“Laws of  
large  
numbers”

Generation of  $m$   
independent (or not)  
samples of size  $n$   
according to  $F$

$$\frac{1}{m-1} \sum_{j=1}^m (u_j - \bar{u})^2 \cong \text{var}_F(U)$$

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$$\hat{G} \cong G(;F), \quad \text{etc.}$$