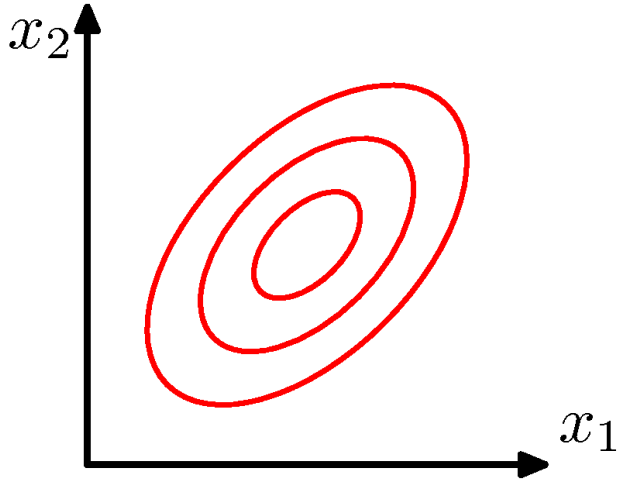
$$P(X=\mathbf{x}_j) = \frac{1}{(2\pi)^{m/2} \|\Sigma\|^{1/2}} \exp\left[-\frac{1}{2}(\mathbf{x}_j - \mu_j)^T \Sigma_j^{-1} (\mathbf{x}_j - \mu_j)\right]$$



Σ = arbitrary (semidefinite) matrix:

- specifies rotation (change of basis)
- eigenvalues specify relative elongation