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6

We will consider animal movement around a single attraction point (0,0).

We will use a potential function.

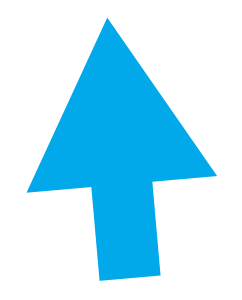
How will we specify the mean drift $\{\mu_x, \mu_y\}'$?

$$H(\{x_t, y_t\}') = k(x_t^2 + y_t^2)$$

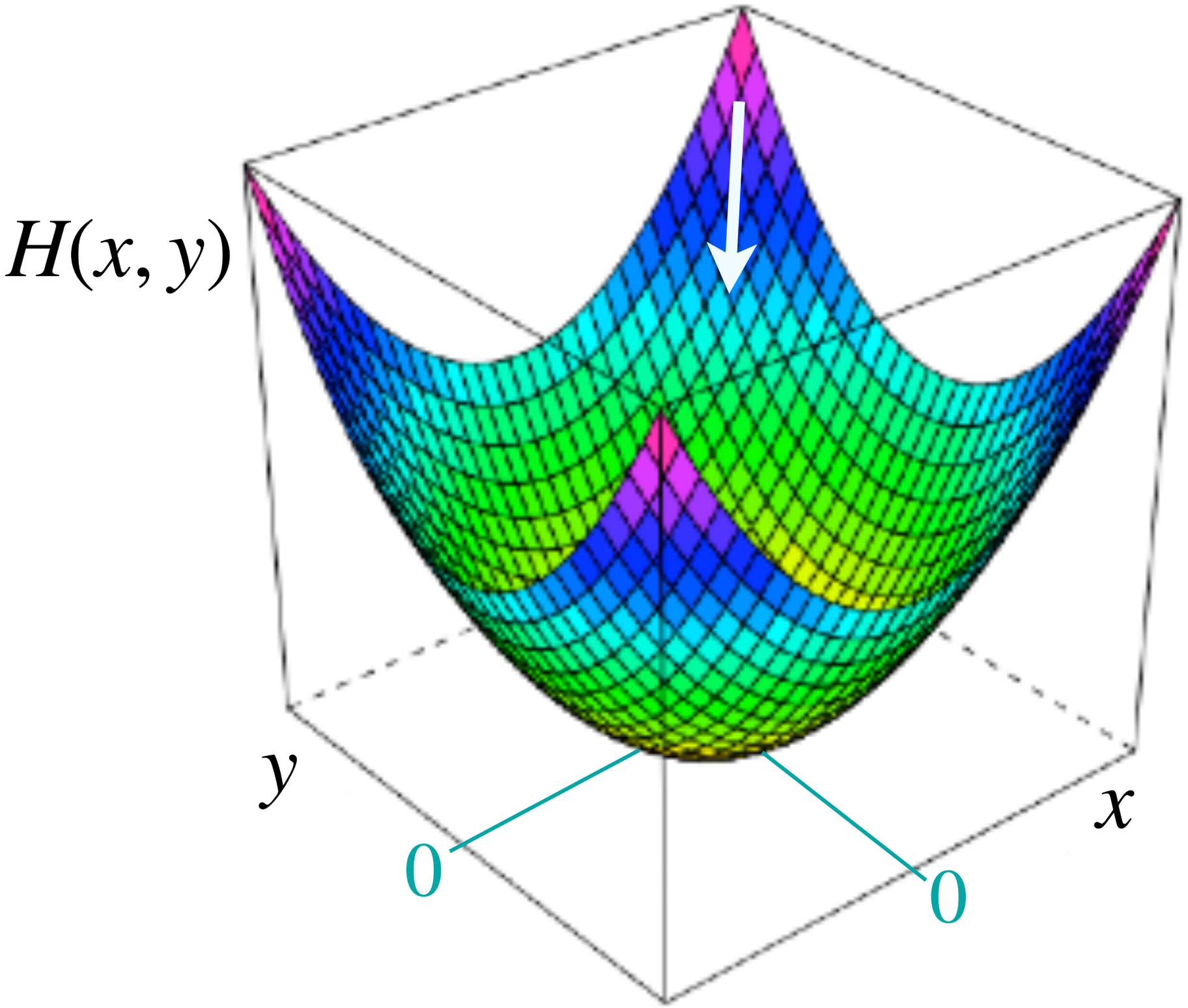
To be estimated

$$\begin{bmatrix} \mu_{x_t} \\ \mu_{y_t} \end{bmatrix} = -\nabla H(\{x_t, y_t\}')$$

$$= -2k \begin{bmatrix} x_t \\ y_t \end{bmatrix}$$

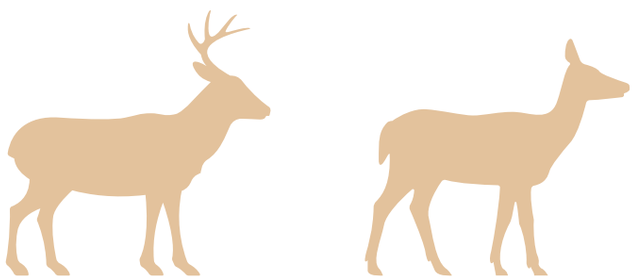


Negative gradient of the potential function

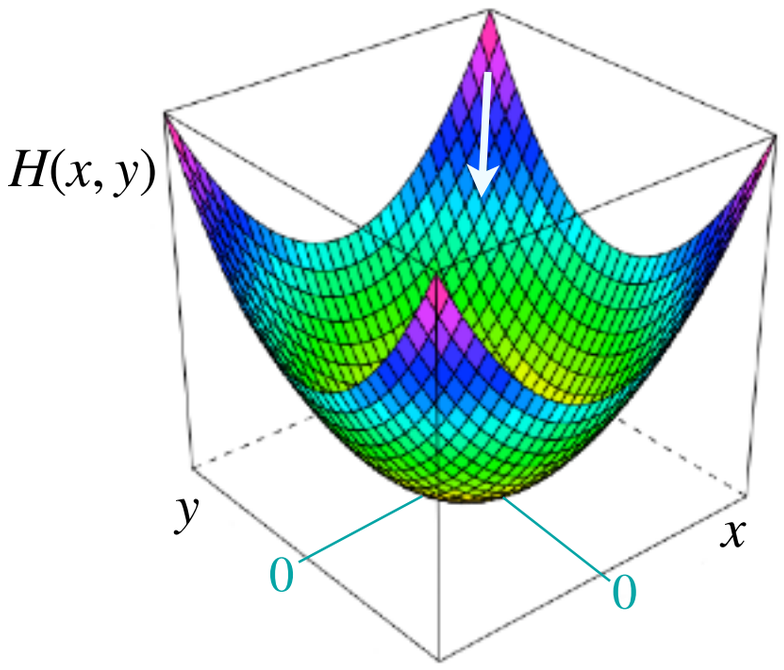

$H(x, y)$
y
x
0
0

How will we specify the mean drift $\{\mu_x, \mu_y\}'$?

We will consider animal movement around a single attraction point (0,0).



We will use a potential function.



To be estimated

$$H(\{x_t, y_t\}') = k(x_t^2 + y_t^2)$$

$$\begin{bmatrix} \mu_{x_t} \\ \mu_{y_t} \end{bmatrix} = -\nabla H(\{x_t, y_t\}')$$

Negative gradient of the potential function

$$= -2k \begin{bmatrix} x_t \\ y_t \end{bmatrix}$$

A toy example: Simulate 500 time steps for one individual from the model