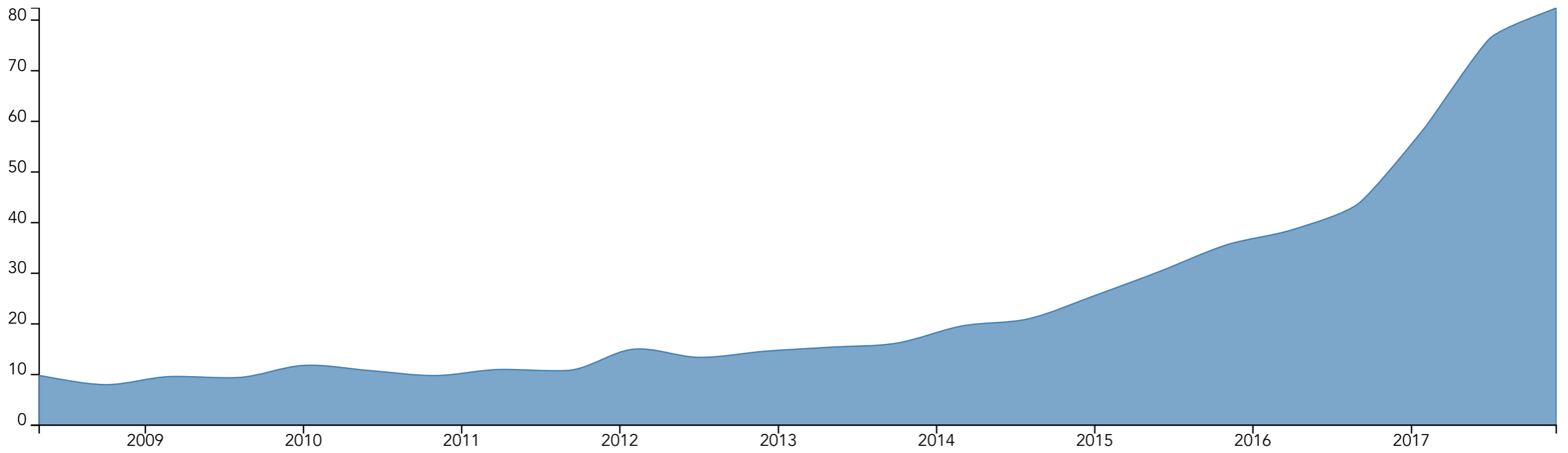


Better Interaction With Black-Box ML Models

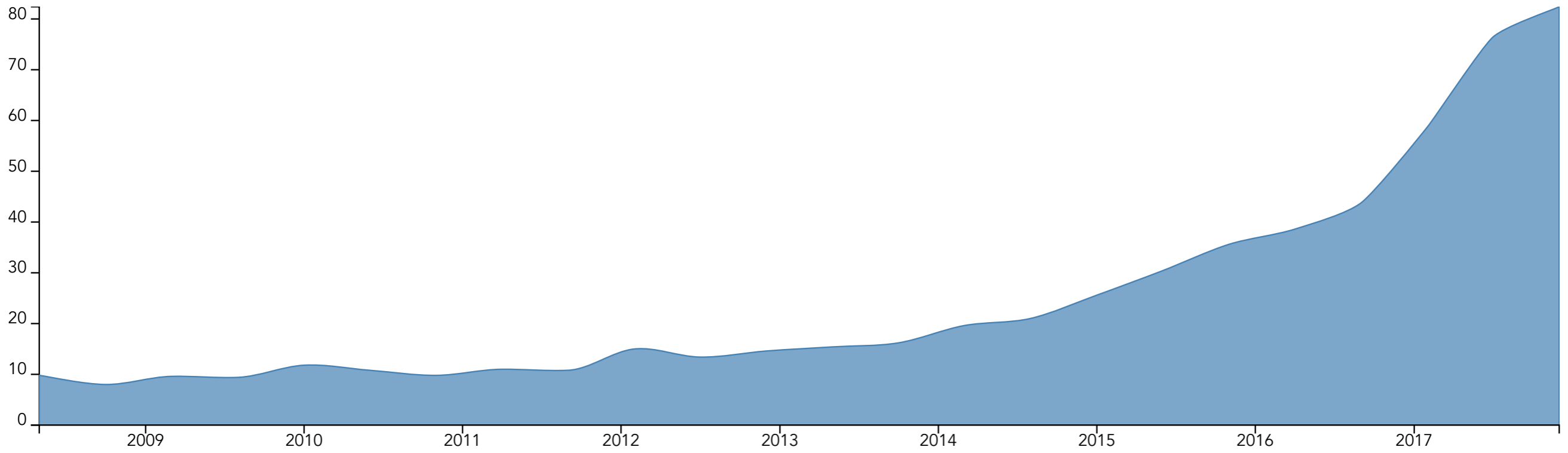
Çağatay Demiralp

March 12, 2018

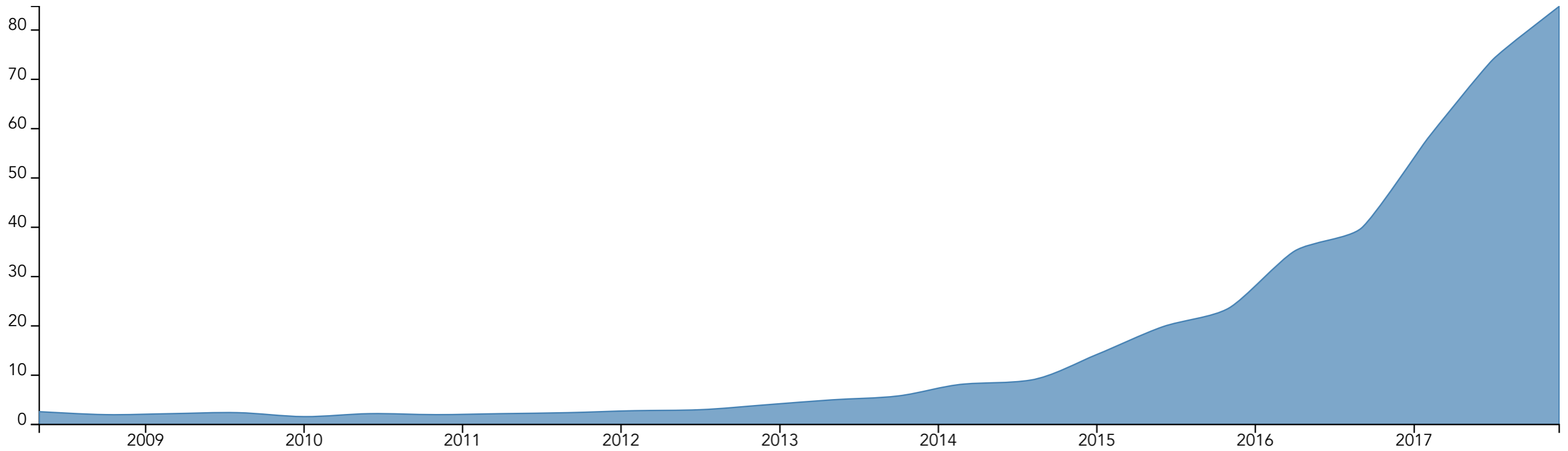
Popularity of Machine Learning



Popularity of **Machine Learning**



Popularity of **Deep Learning**



AI





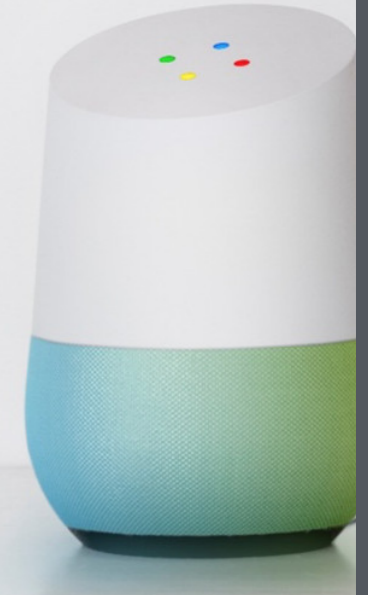


IBM Watson™

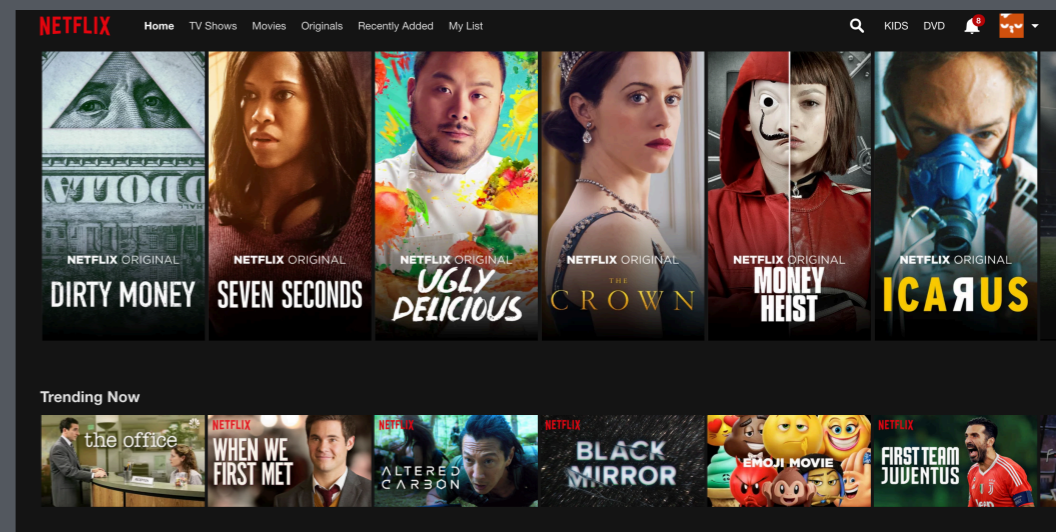
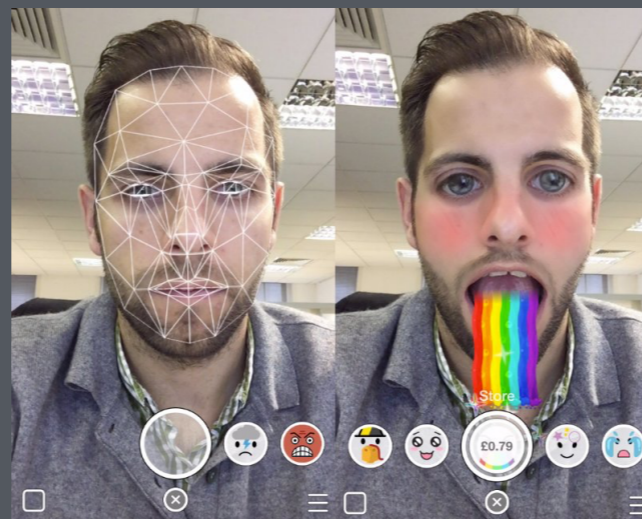
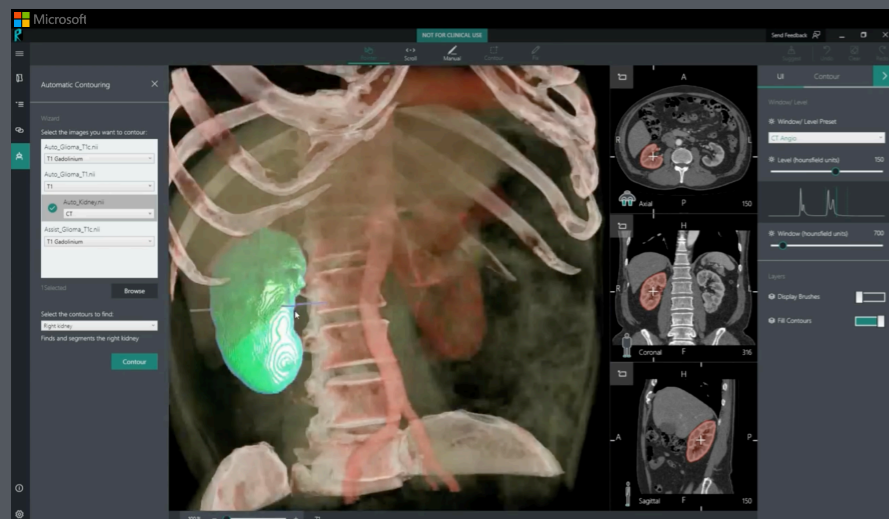
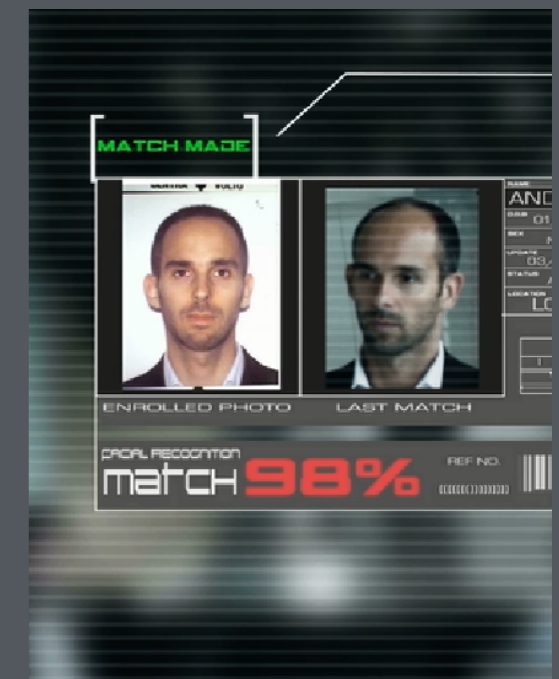
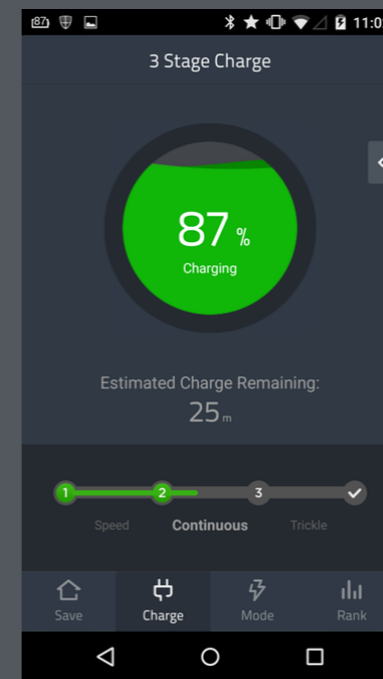


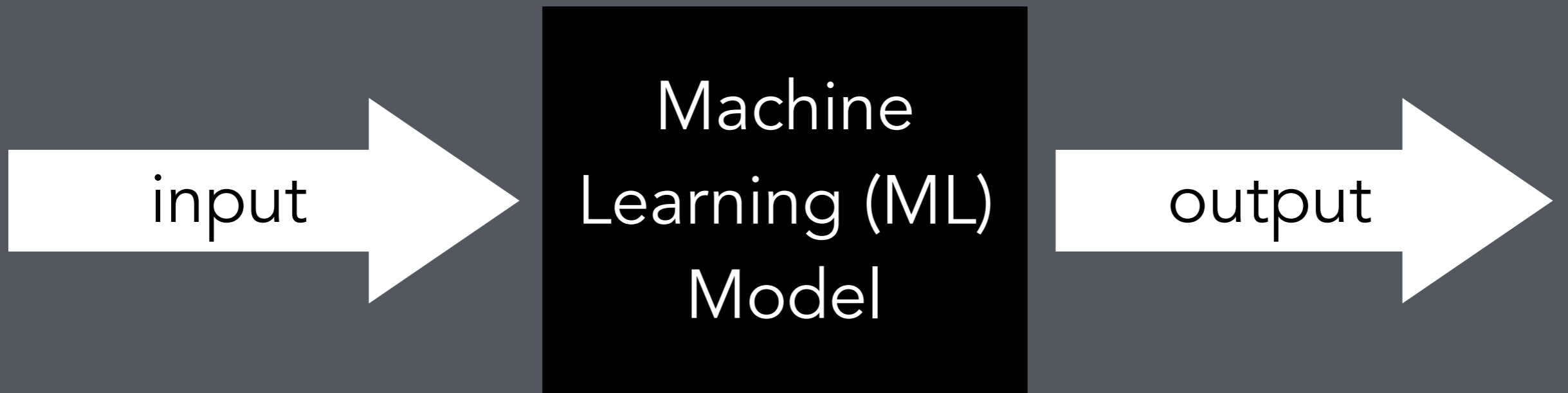
Google

Translate



echo







input

Machine Learning (ML) Model

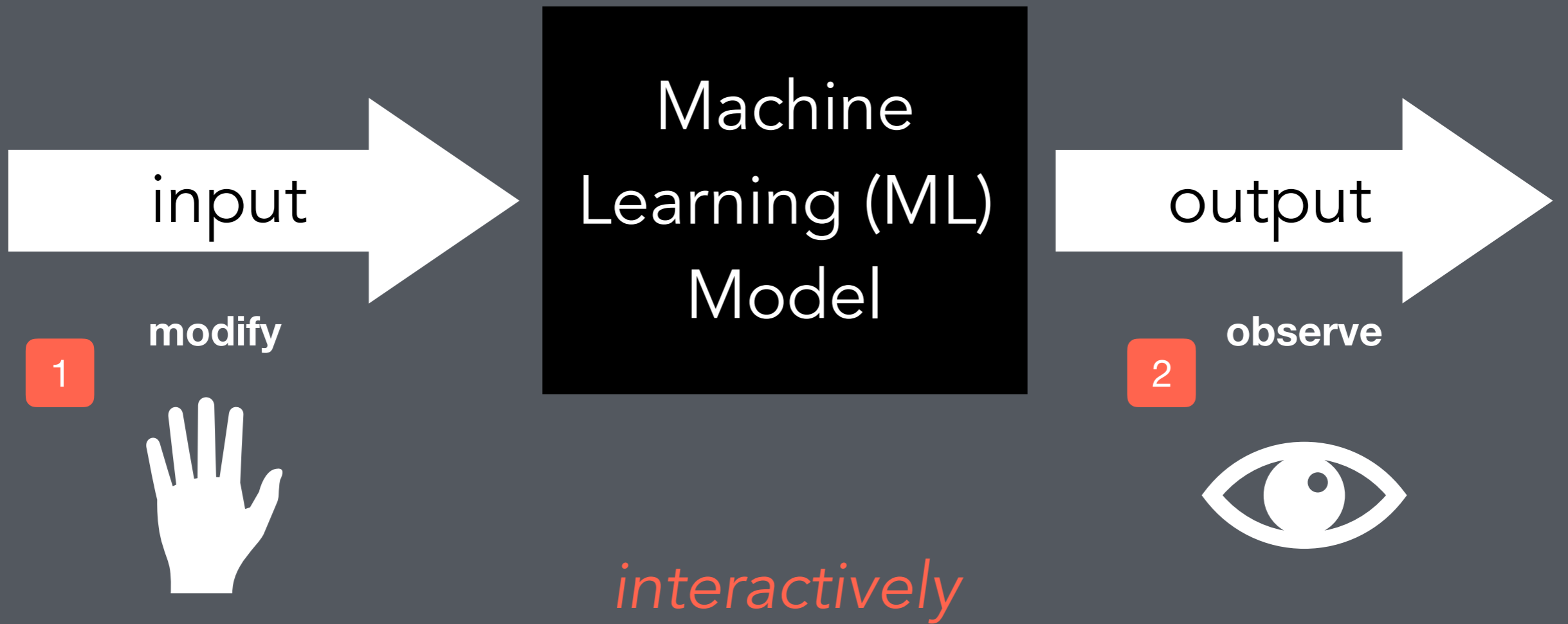
output

1

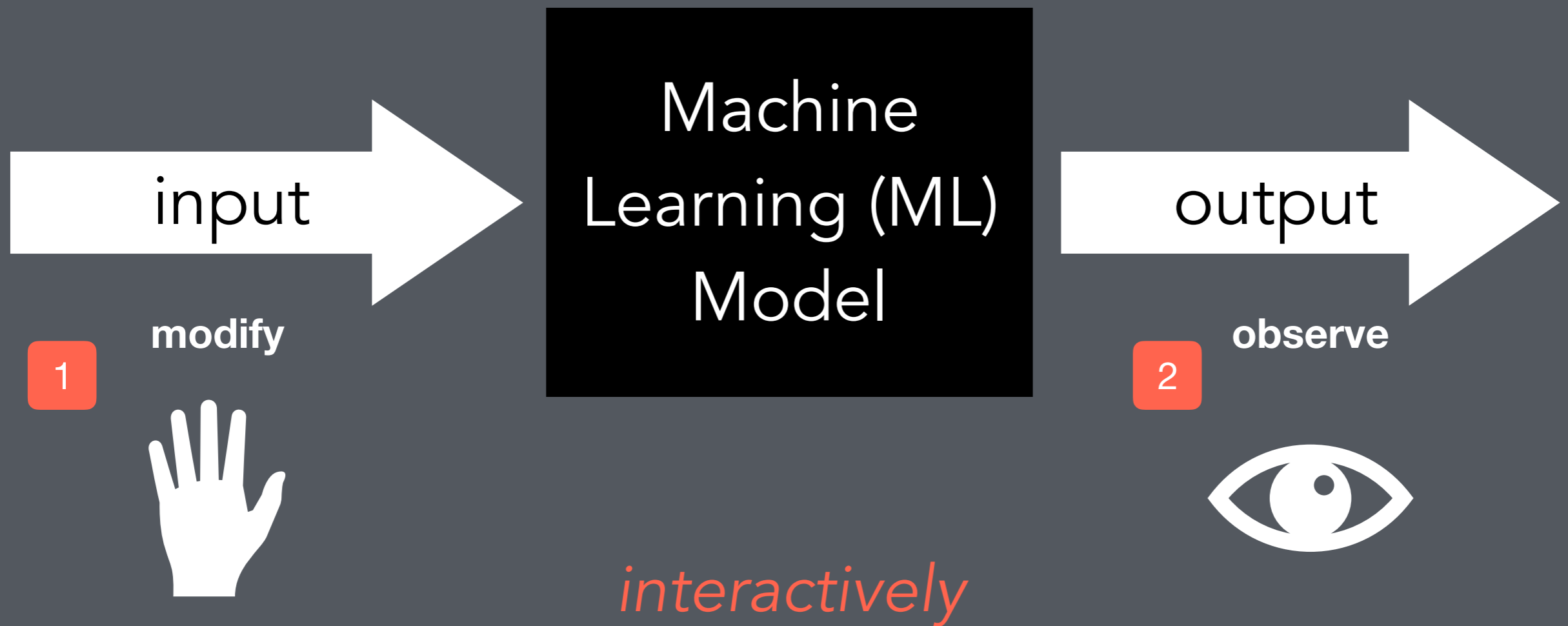
modify







dynamic forward mapping





input

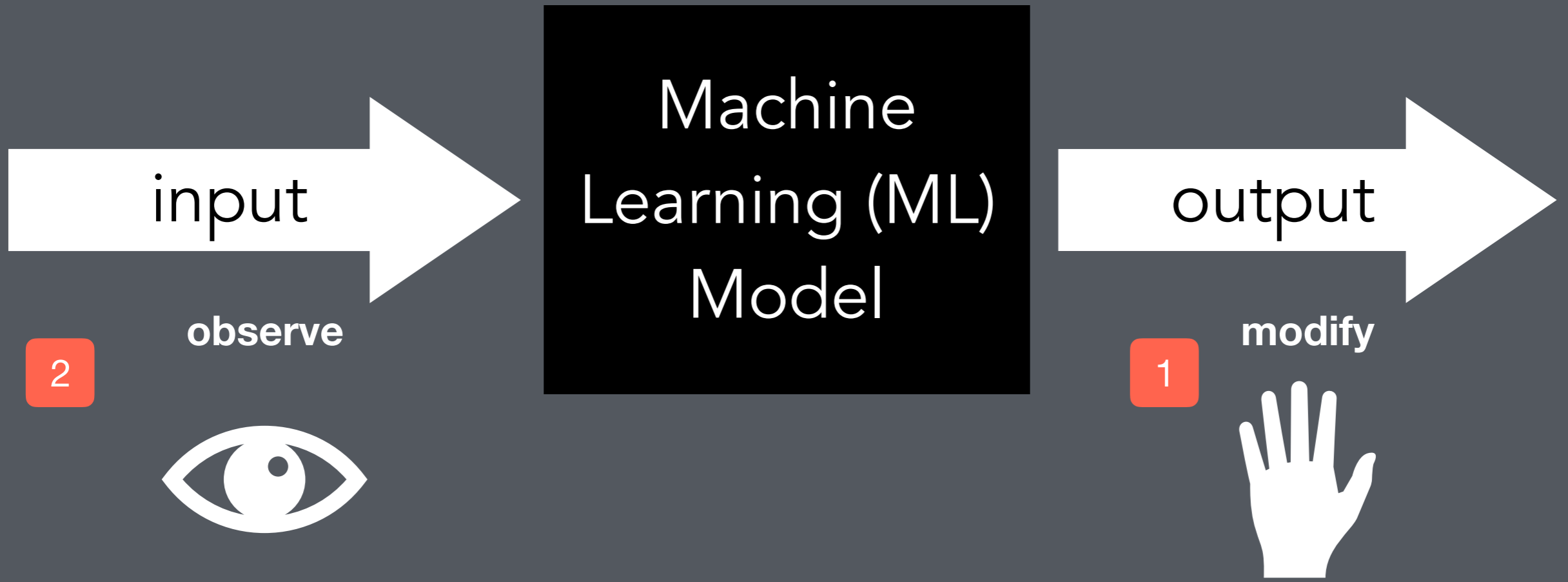
Machine Learning (ML) Model

output

1

modify





input

Machine Learning (ML) Model

output

2

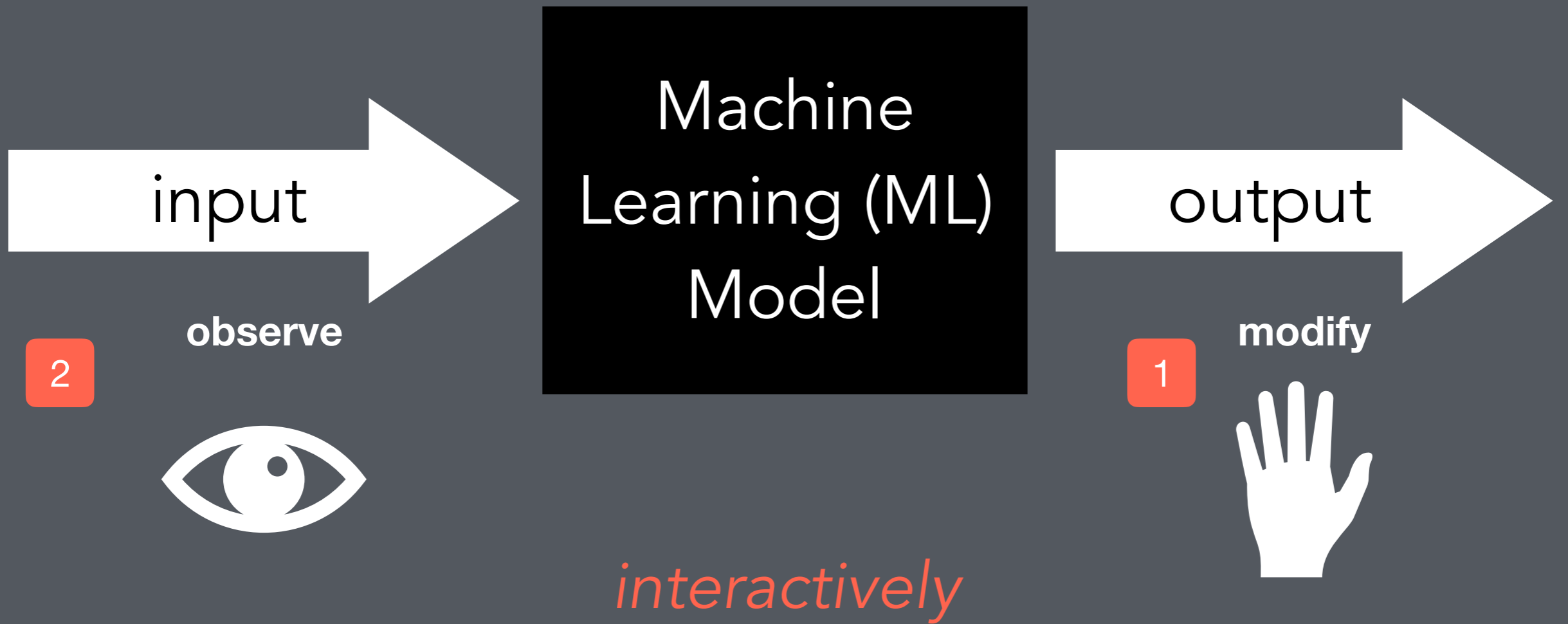
observe



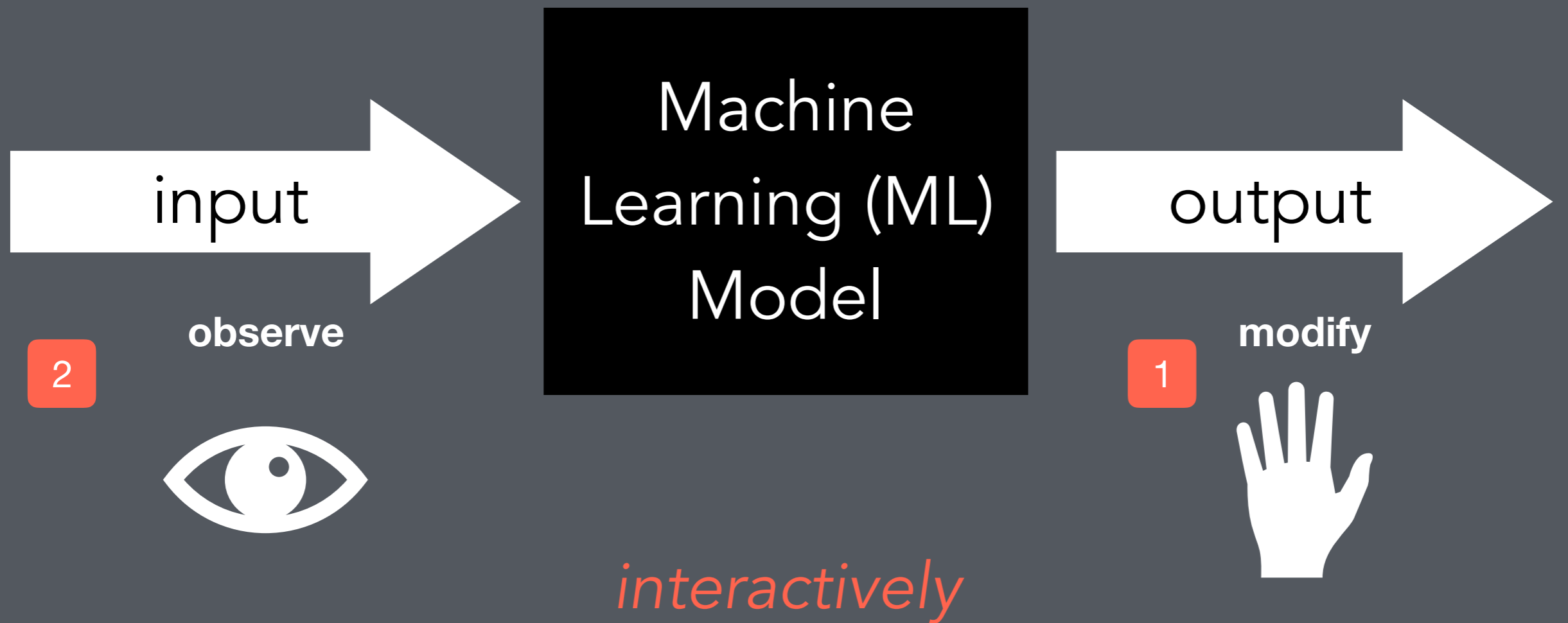
1

modify

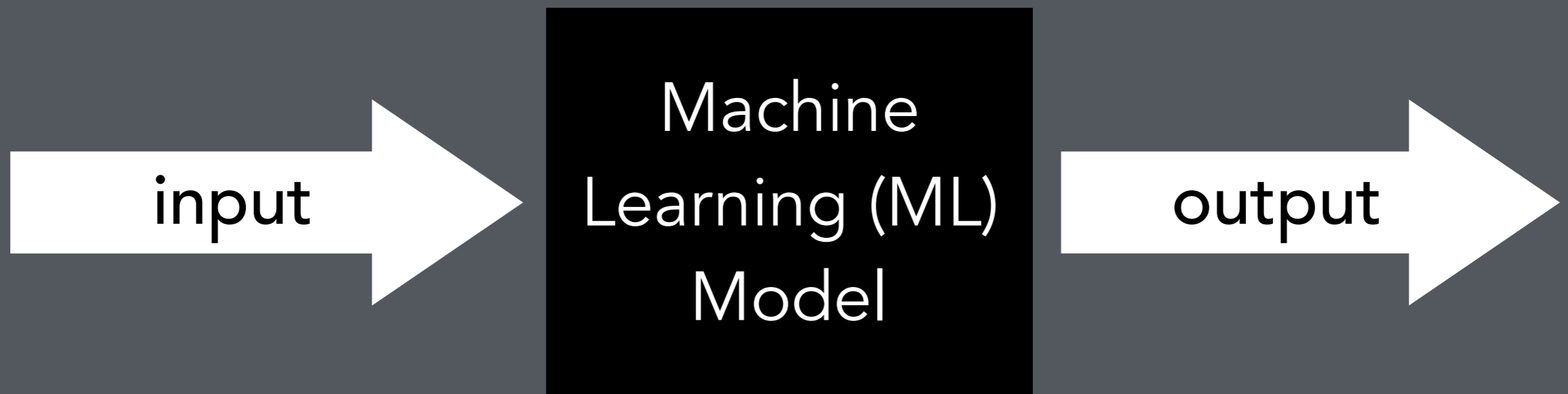




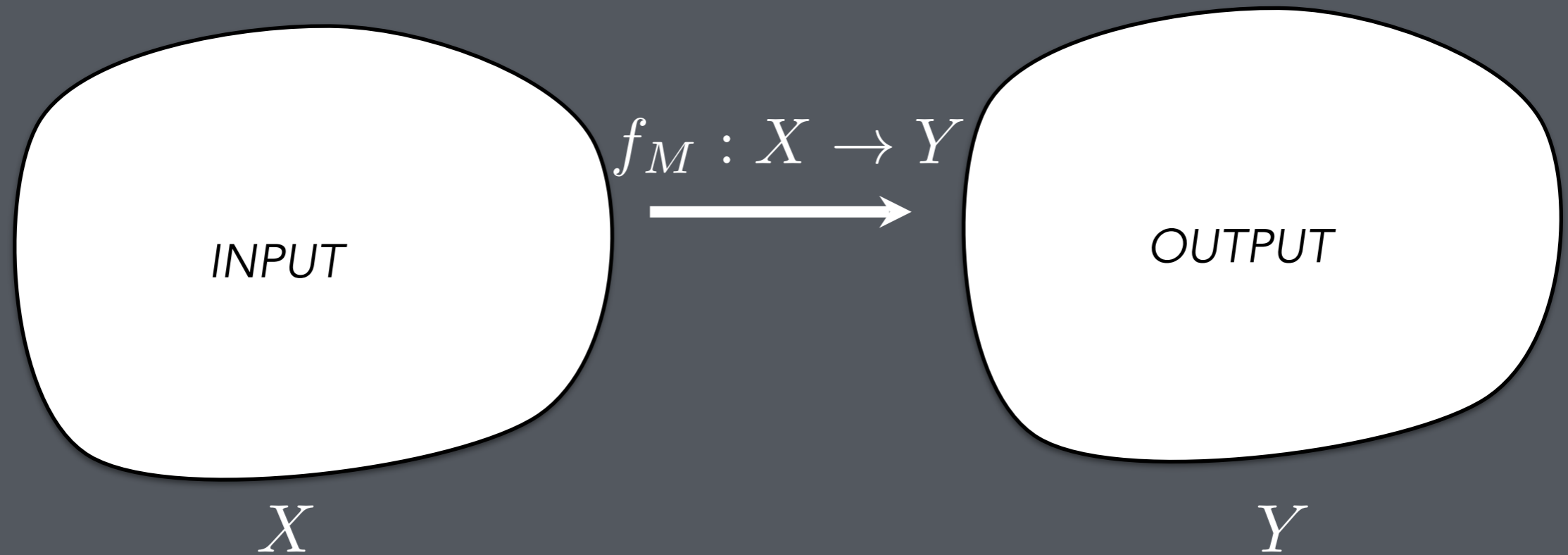
dynamic backward mapping



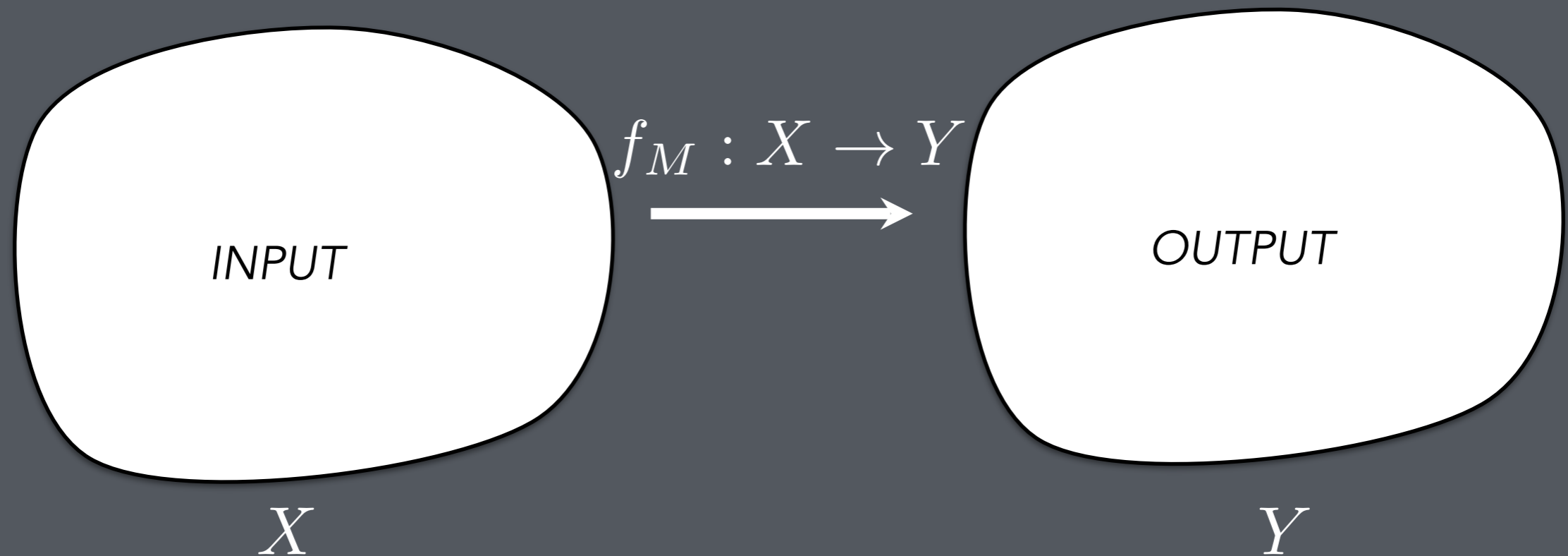
What do we need?



A Functional View



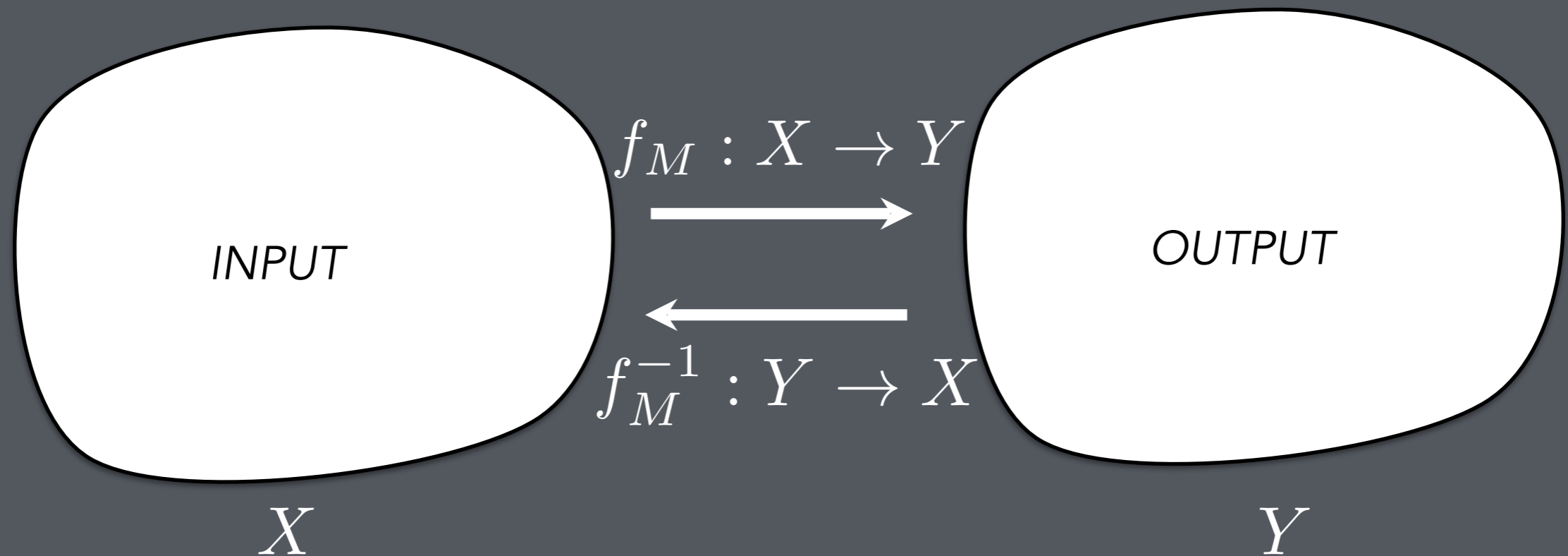
What do we need?



Access to: f_M

Fast computation of: f_M

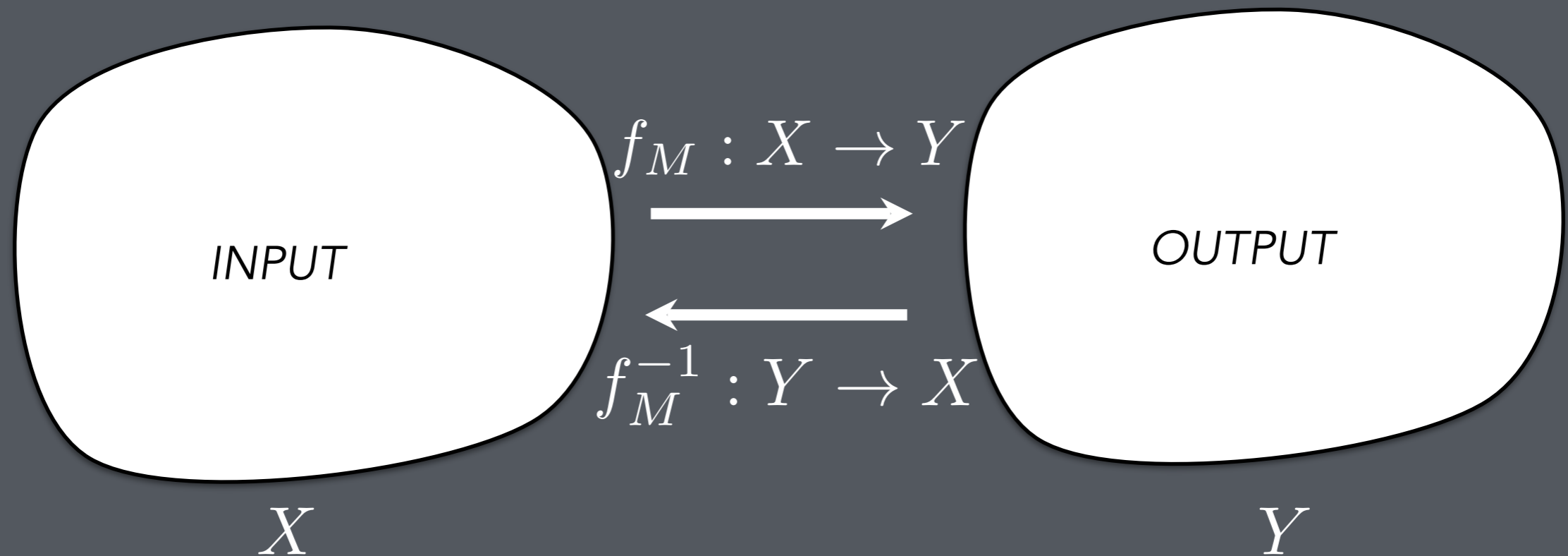
What do we need?



Access to: f_M

Fast computation of: f_M

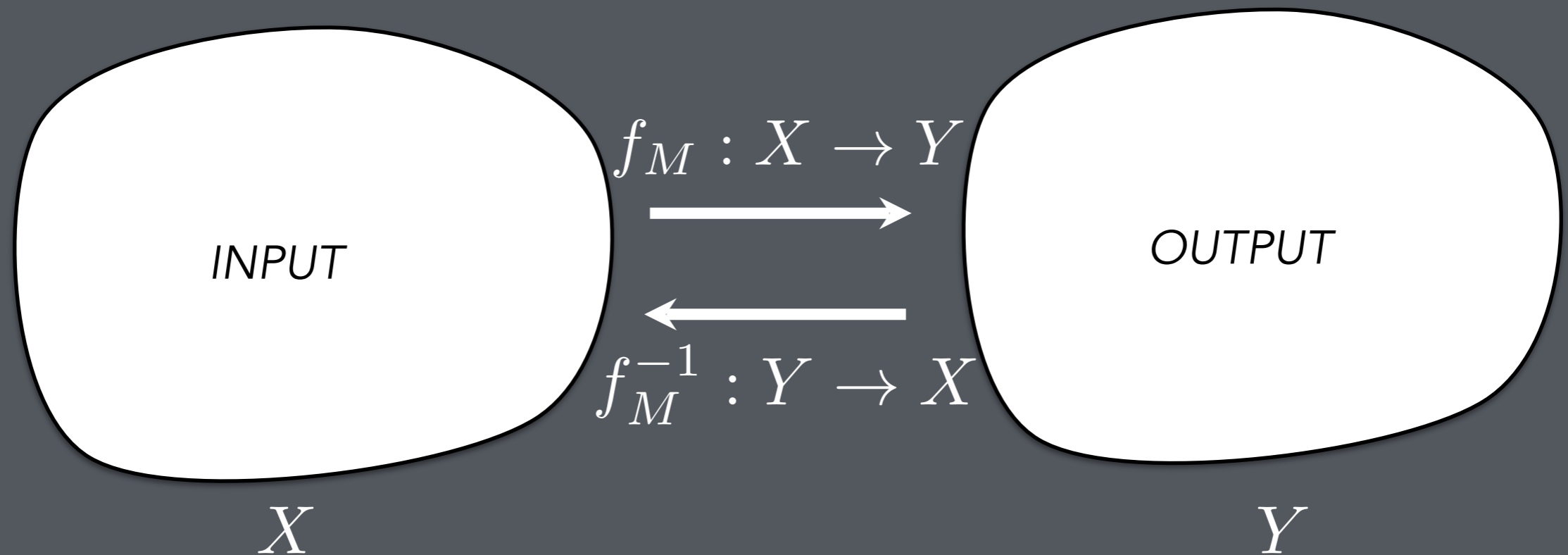
What do we need?



Access to: f_M, f_M^{-1}

Fast computation of: f_M, f_M^{-1}

What do we need?



Access to: f_M, f_M^{-1}

Fast computation of: f_M, f_M^{-1}

approximation, constraints

A Specific ML Black Box: Dimensionality Reduction



A Specific ML Black Box: Dimensionality Reduction



Joint work with **Marco Cavallo**




Import dataset Dataset loaded - 200 rows

Autoencoder MNIST

Dataset contains labels Use prolines

7 2 1 0 4 9 5 6 3 8

Selection Details



Praxis