Input
layer

Hidden
layer

Output
layer

I_1

I_2

I_3

I_n

H_1

H_n

O

```
            ┌─────────────┐
            │  Previous   │
            │ bidding data│
            └─────────────┘
                   │
                   ▼
            ┌─────────────┐
            │Begin/Continue│
            │ Calibration │
            │  of model   │
            └─────────────┘
```

Previous bidding data

Begin/Continue Calibration of model

Data is broken up into random batches

Model weights are calibrated for each attribute of the data

Model is validated to see if it should stop calibrating

If validation improvement is not decreasing, STOP

Binary Outcome

Win - 1

Loss - 0

$$\min\ c^\top x$$
$$s.t.\ Ax = b$$
$$x \geq 0.$$

```
 _____
|            |
|  Training  | ----->  | Untrained |
|    data    |         |   model   |
|_____|
```
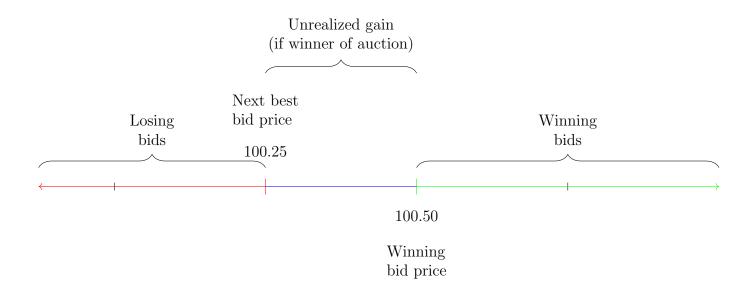
Step 1: Large amount of previous bidding data is fed to the model.

Step 2: The model learns the optimal weights from the data.

$$\min\ c^\top x$$
$$\text{s.t.}\ Ax = b$$
$$x \geq 0.$$

Unrealized gain
(if winner of auction)

Next best
bid price

100.25

Losing
bids

Winning
bids

100.50

Winning
bid price

Estimated win rate

Gap

Actual win rate