

A photograph of a lush green forest. In the foreground, there's a rocky stream bed with several large, light-colored boulders. The background is filled with tall, thin trees, likely conifers, with sunlight filtering through the canopy, creating bright highlights on the trunks and leaves.

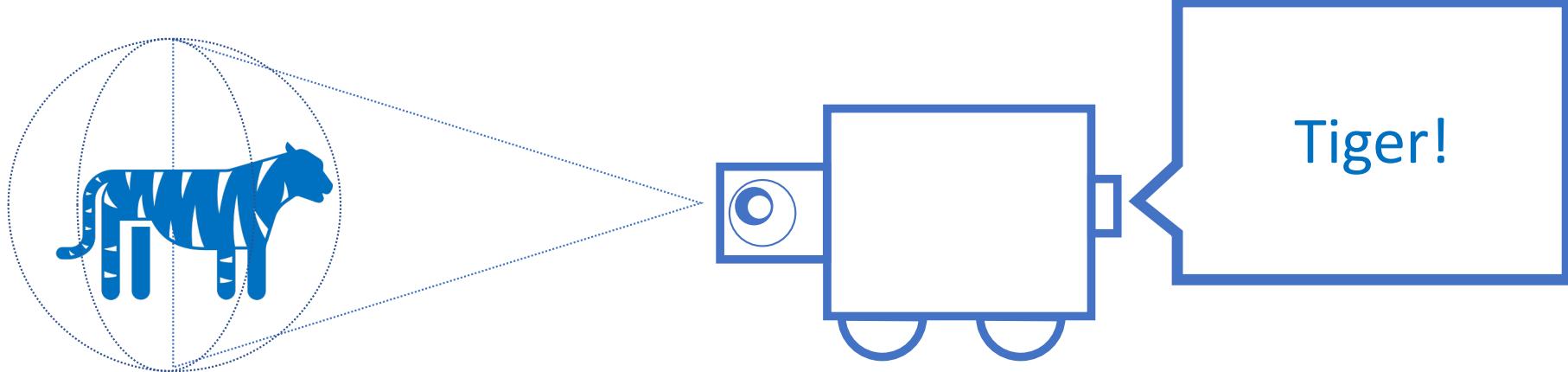
# Intro to Machine Learning

Jonny Kalambay

# What is Machine Learning

An application of artificial intelligence (AI) that provides systems the ability to automatically learn and improve from experience without being explicitly programmed.

# What is Machine Learning



# Types of Machine Learning

Supervised Learning

Unsupervised Learning

Semi-Supervised Learning

Reinforcement-Learning

# Machine Learning Applications

Supervised

Unsupervised

Semi Supervised

Reinforcement

Virtual Assistants

Social Suggestions

Autonomous Vehicles

Product Recommendations

Face Recognition

Spam Filtering

Snapchat Filters

Chatbots

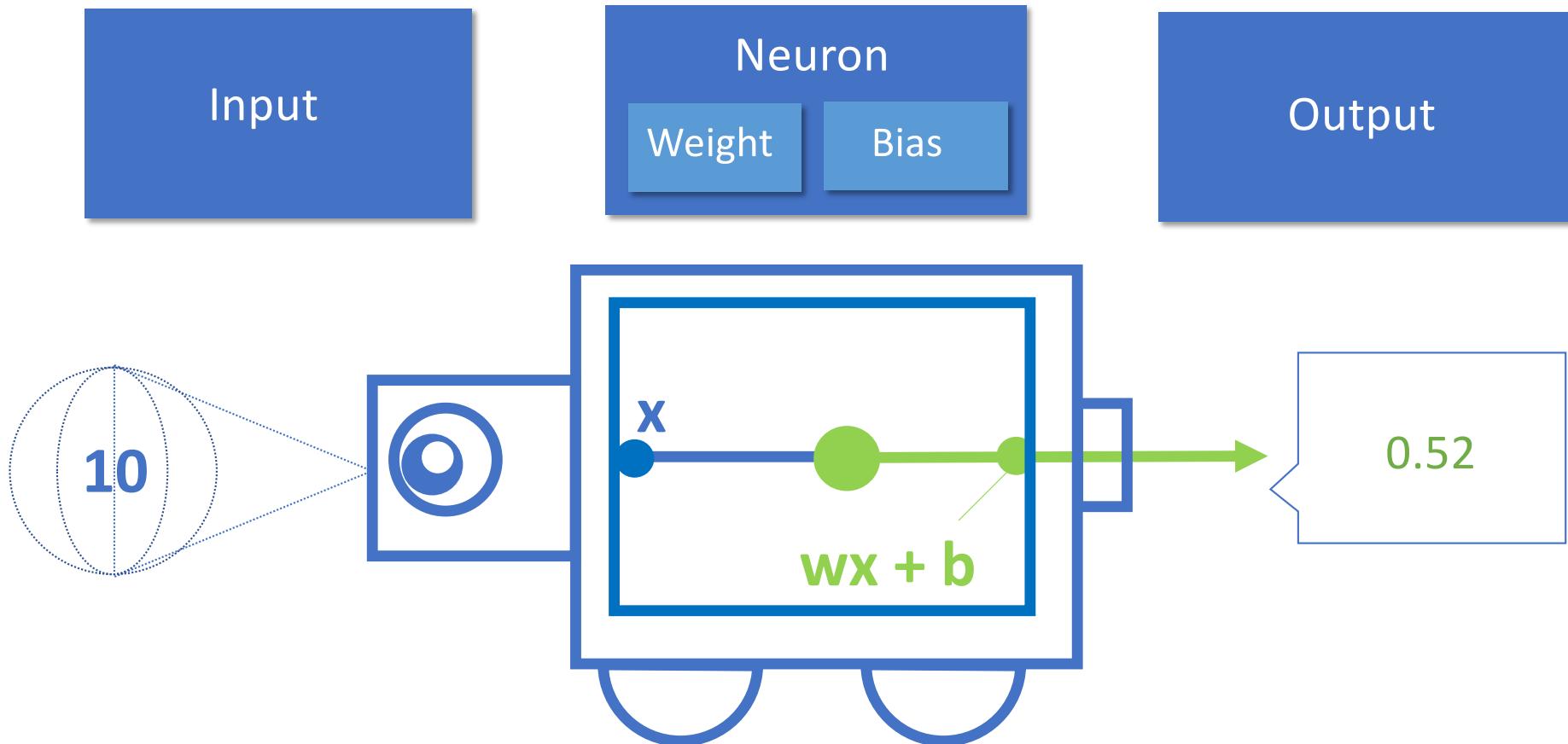
Marketing Analysis

Fraud Detection

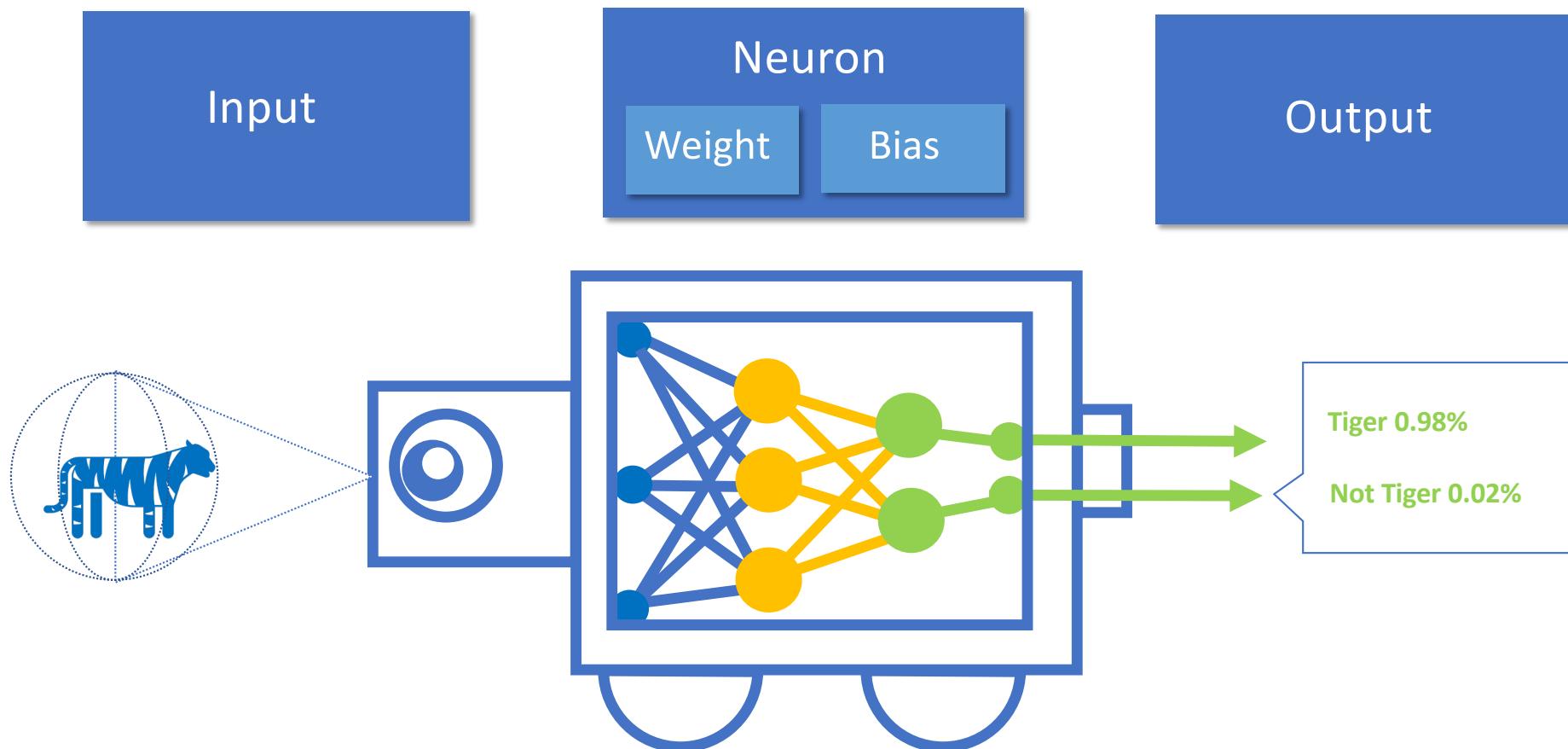
Website Classification

Game AI

# The Neural Network



# The Model



# Training

## Prediction

Data



Model



Predictions

## Loss Calculation

Predictions



Ground Truth



Loss Function



Loss

## Optimization

Loss



Model



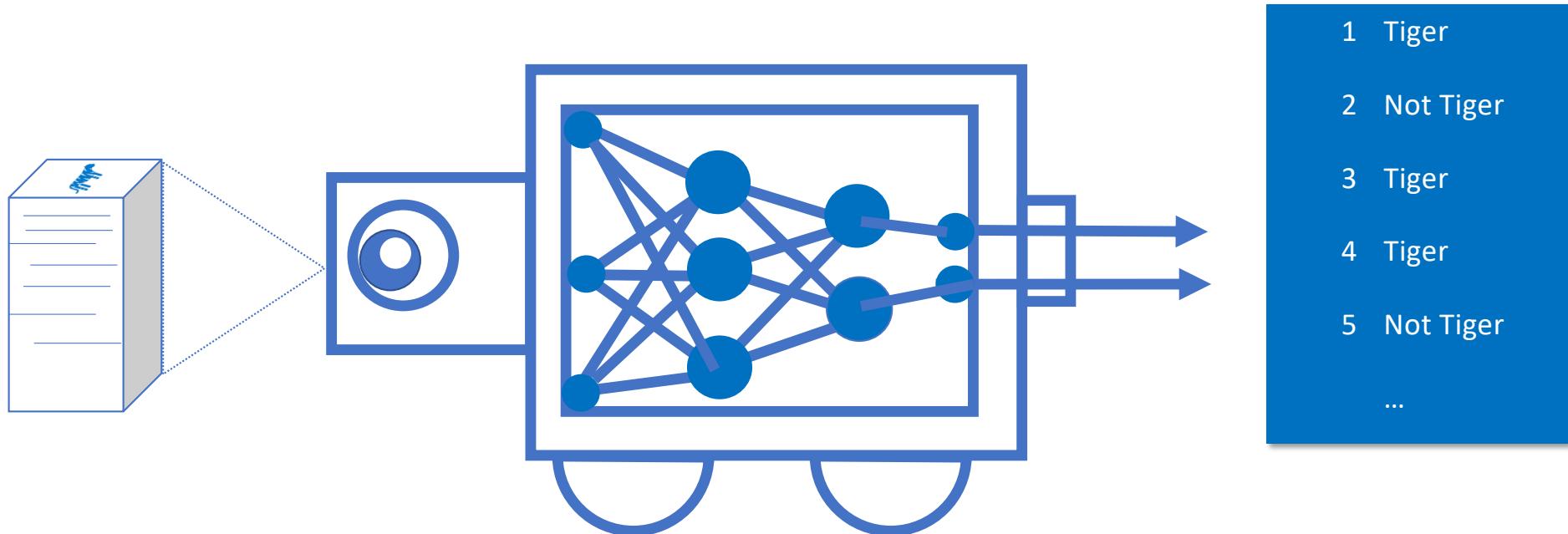
Optimizer



Adjusted Model

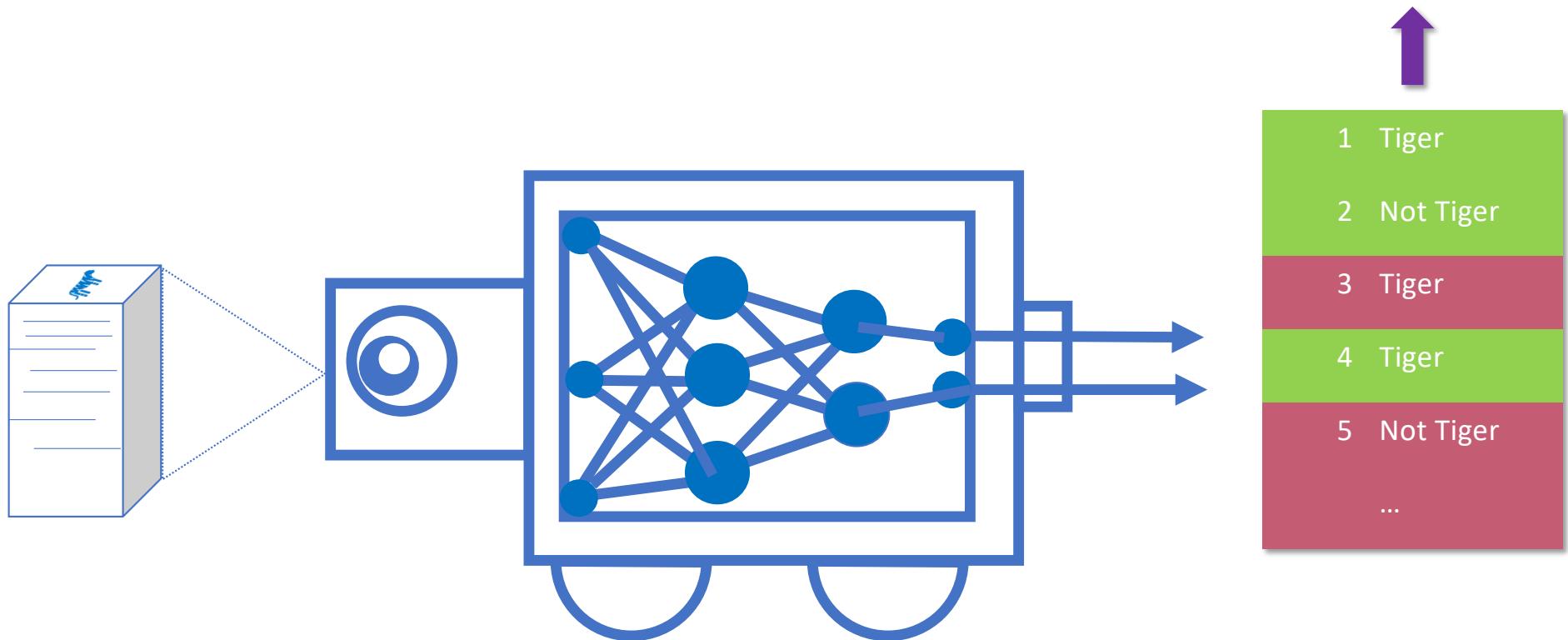
# Training

## Step 1: Prediction



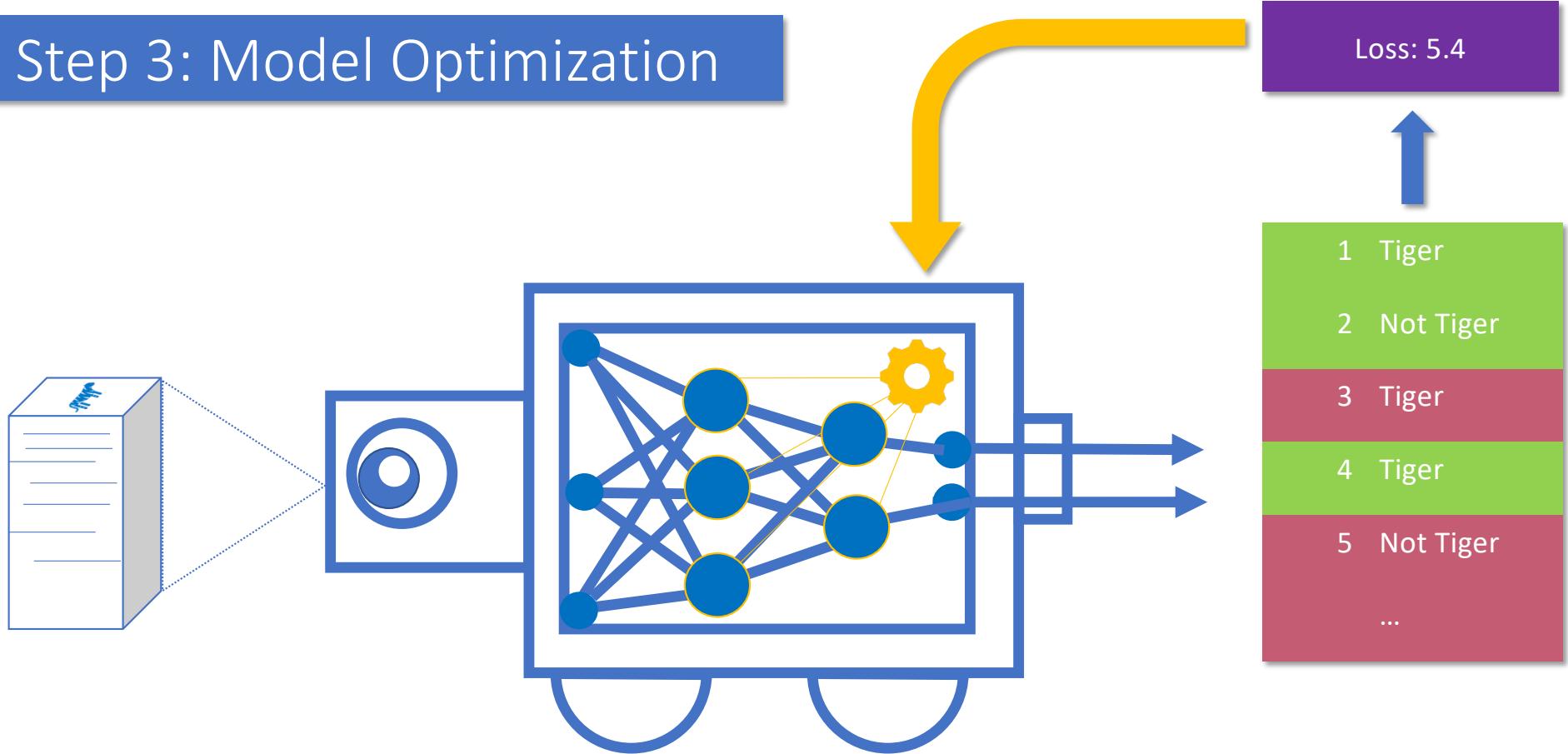
# Training

## Step 2: Loss Calculation

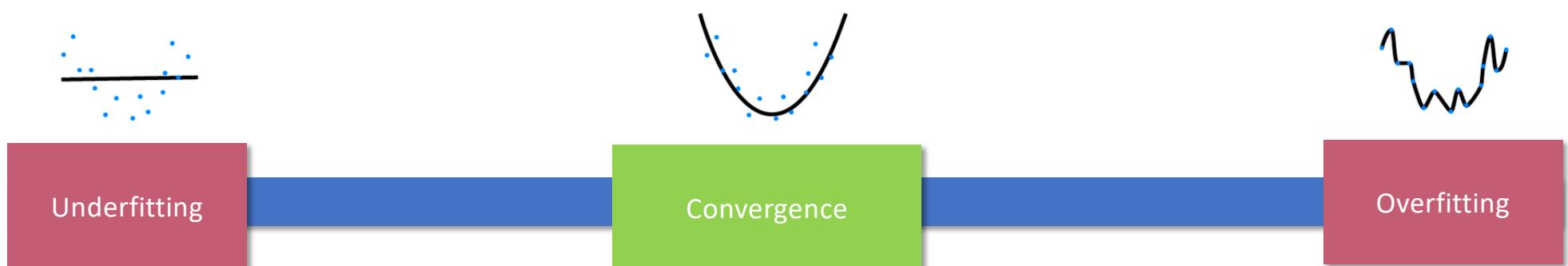
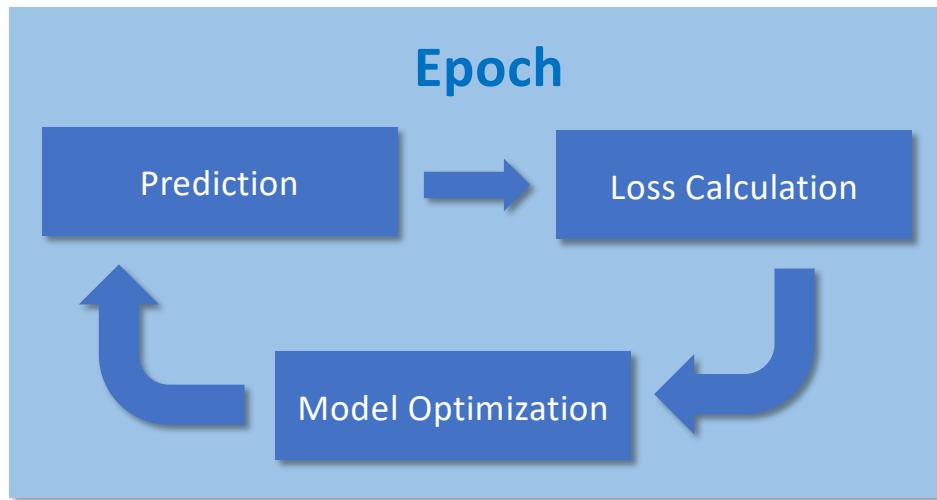


# Training

## Step 3: Model Optimization

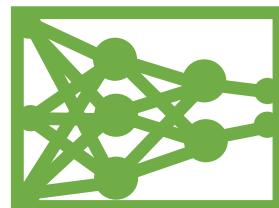


# Training Steps

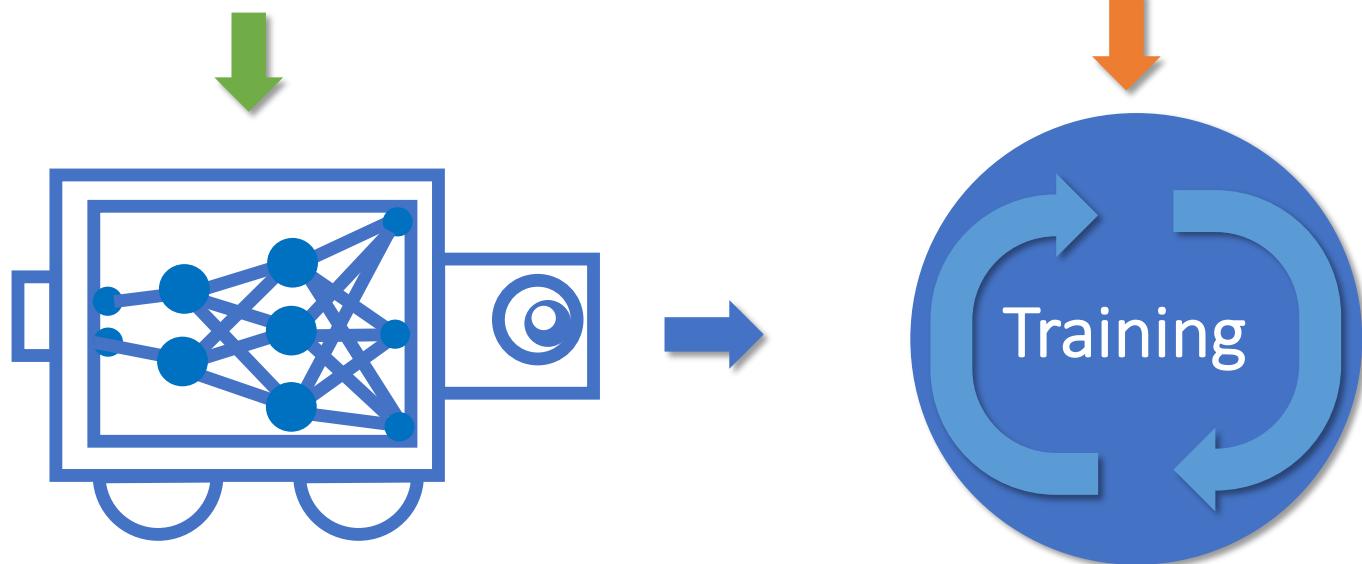


# Transfer Learning

Pre-Trained  
Weights



Smaller  
Dataset



# Beyond Image Classification



Multi-Label



Object Detection



Image Segmentation

# Examples

## Linear Regression

<https://colab.research.google.com/drive/15x7P7ivrkYOzYivD3xRfYW1XfdEsMNhe>

## Image Classification

[https://colab.research.google.com/github/tensorflow/examples/blob/master/community/en/flowers\\_tf\\_lite.ipynb](https://colab.research.google.com/github/tensorflow/examples/blob/master/community/en/flowers_tf_lite.ipynb)

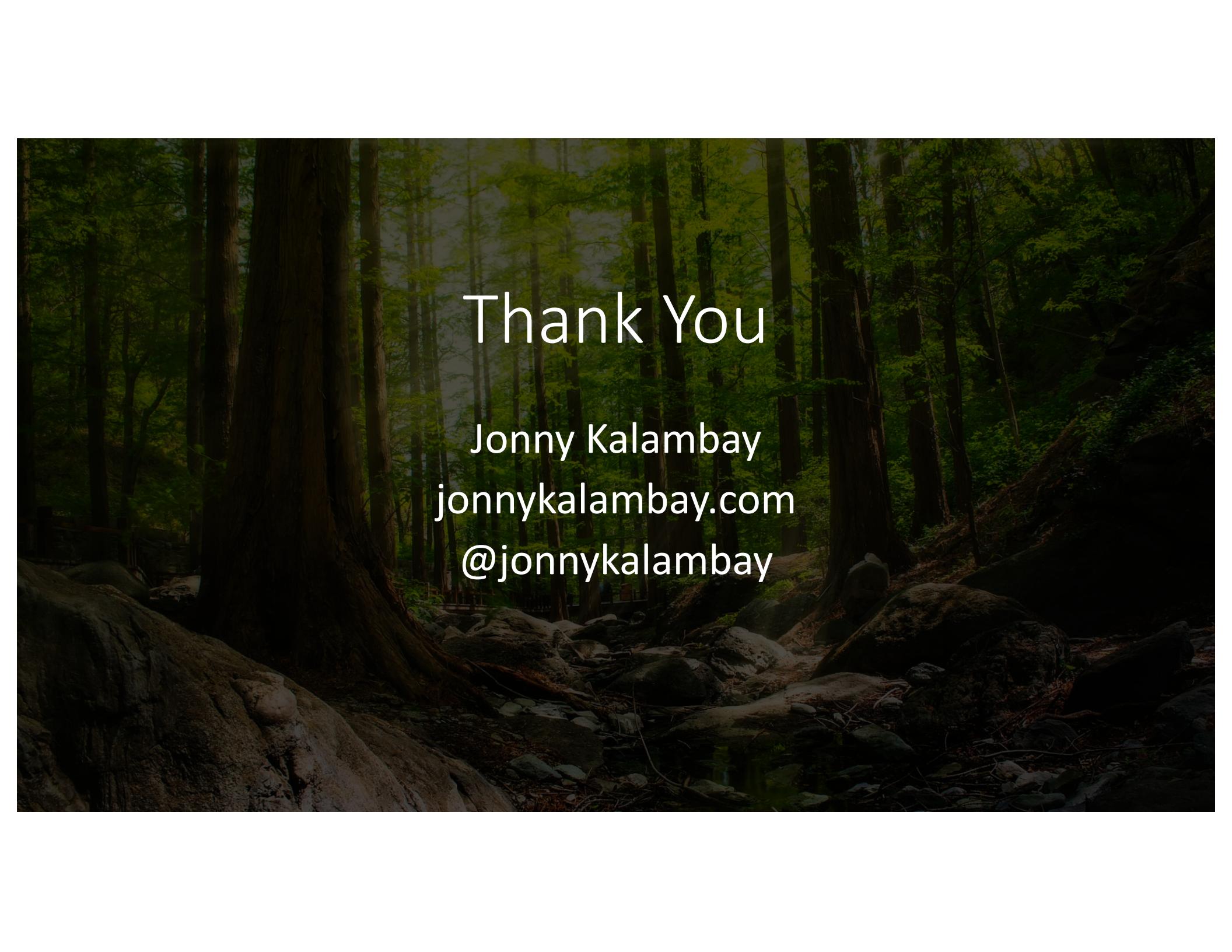
# Where to Learn More

## Online Courses

- Fast AI - <https://www.fast.ai/>
- Stanford - Machine Learning - <https://www.coursera.org/learn/machine-learning>
- Udacity - <https://www.udacity.com/>

## Books

- Hands-On Machine Learning with Scikit-Learn and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems

A photograph of a forest scene. In the foreground, there are large, mossy rocks and fallen logs. Behind them, a dense thicket of tall, thin trees, likely cedar or similar conifers, rises towards a bright sky. The lighting creates a strong contrast between the dark trunks and the bright canopy.

Thank You

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