{AI}

# Sudoku Solver

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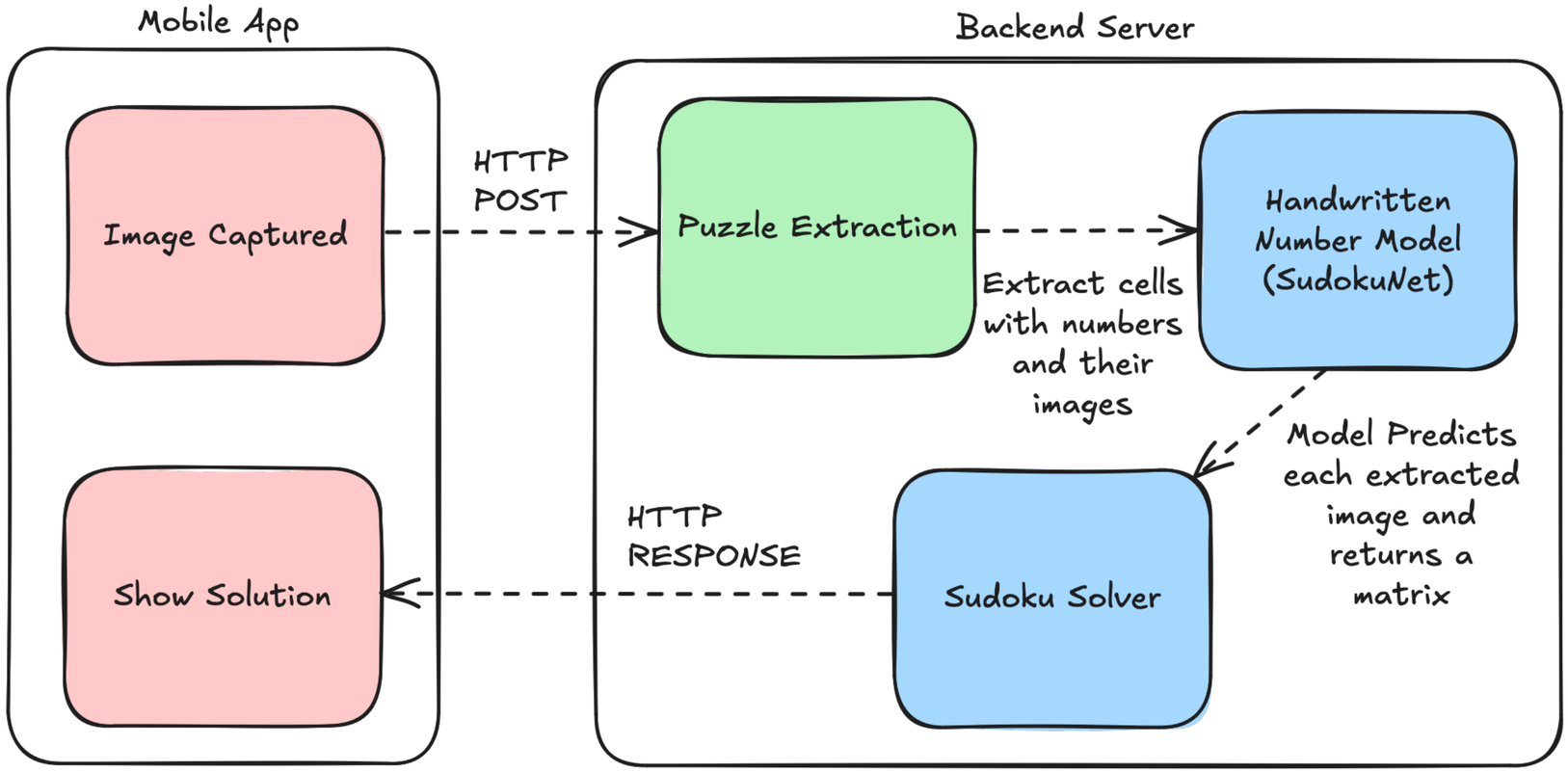
# Agenda for today

Current Architecture
Improvements
Challenges
Current Model
Sudoku Image Processing
Mobile Application Demo
Future Improvements

# Current Architecture



# Improvements

No more problematic numbers

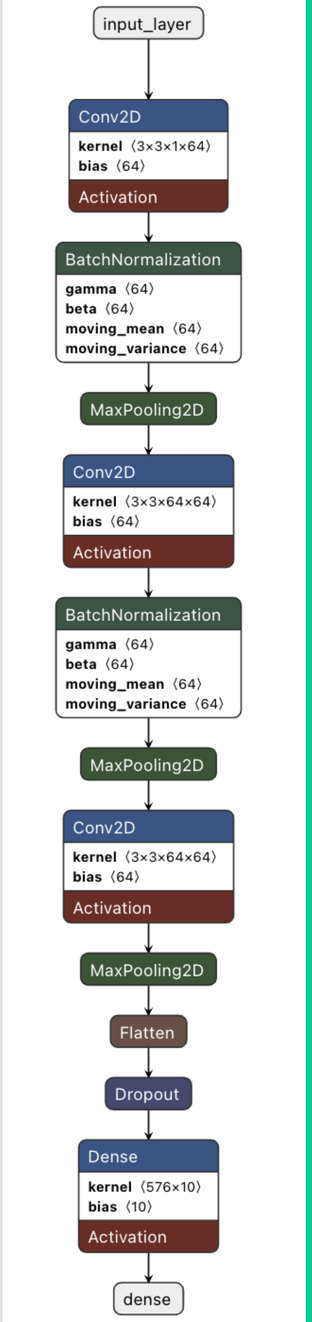
*Scanning and identifying Sudoku Board*

Number extraction from Sudoku Cells

*Mobile App Interface*

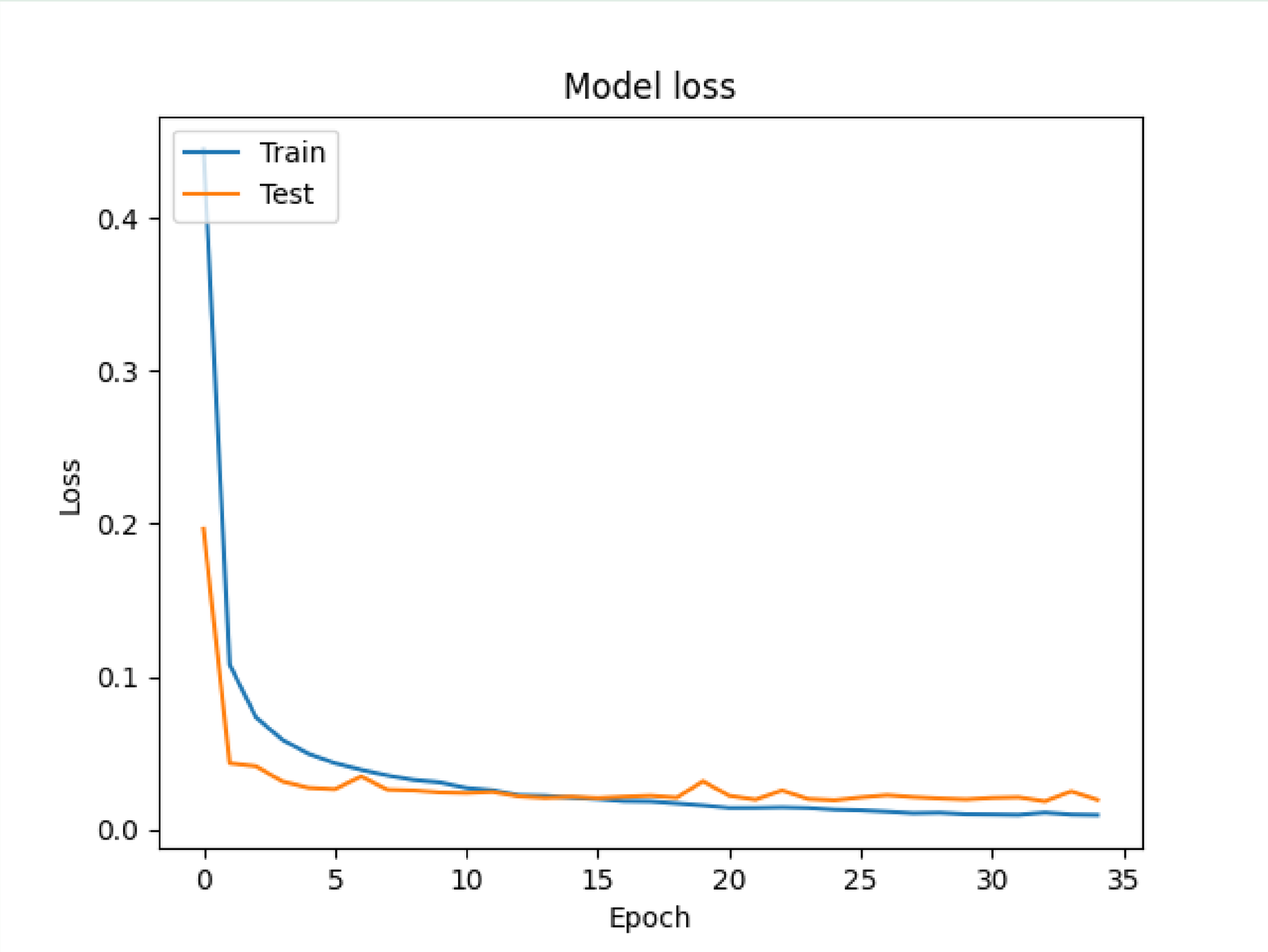
# Model

How does our model look now?



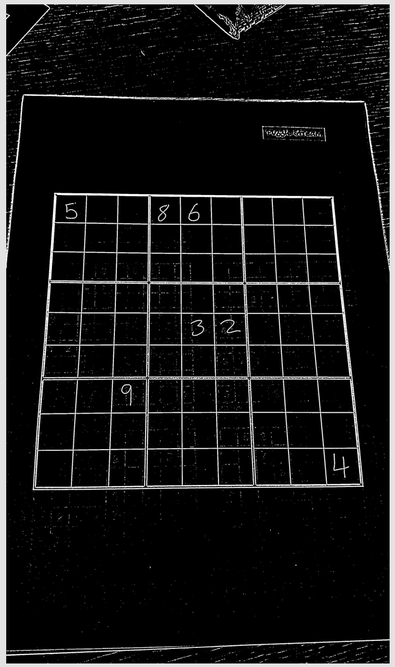

```python
self.model = tf.keras.Sequential([
    # Input layer specifying the input shape
    layers.Input(shape=[28, 28, 1]),  # Input layer

    # First Convolutional Block (3 layers of Conv2D with 64 filters)
    layers.Conv2D(filters=64, kernel_size=3, activation='relu', padding='same'),
    layers.BatchNormalization(),
    layers.MaxPooling2D(pool_size=(2, 2)),
    layers.Conv2D(filters=64, kernel_size=3, activation='relu', padding='same'),
    layers.BatchNormalization(),
    layers.MaxPooling2D(pool_size=(2, 2)),
    layers.Conv2D(filters=64, kernel_size=3, activation='relu', padding='same'),
    layers.MaxPooling2D(pool_size=(2, 2)),

    # Head
    layers.Flatten(),
    layers.Dropout(0.5),
    layers.Dense(units=10, activation="softmax"),
])
```

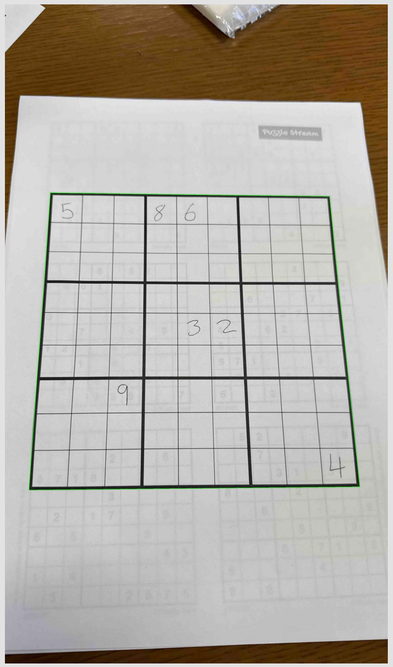
# Model

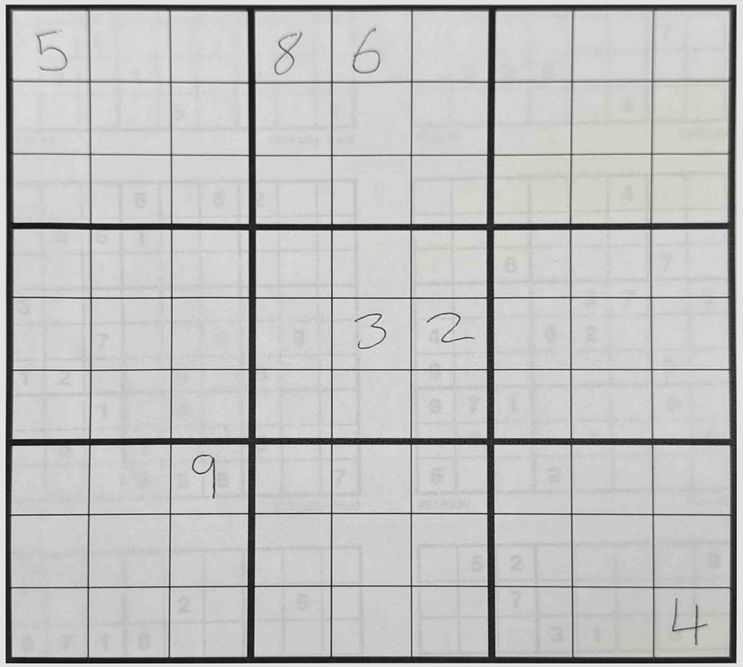


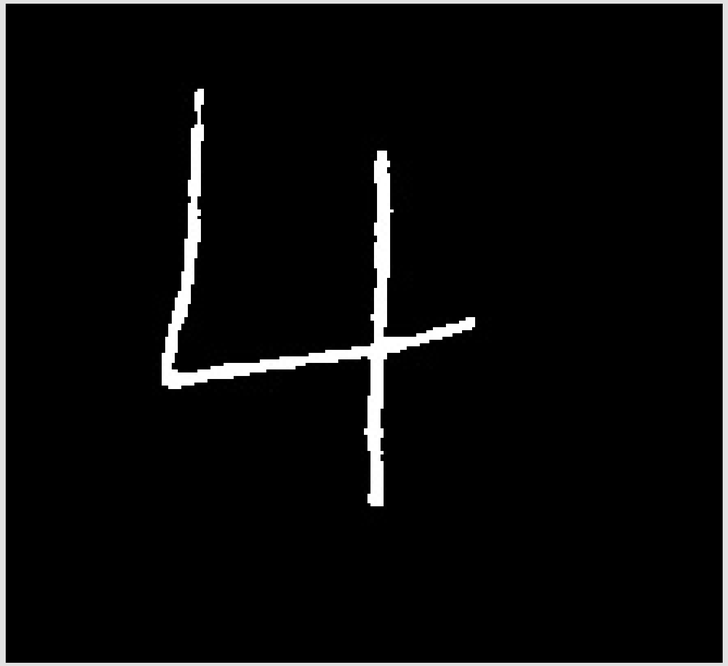

**accuracy: 0.9930**
**loss: 0.0173**

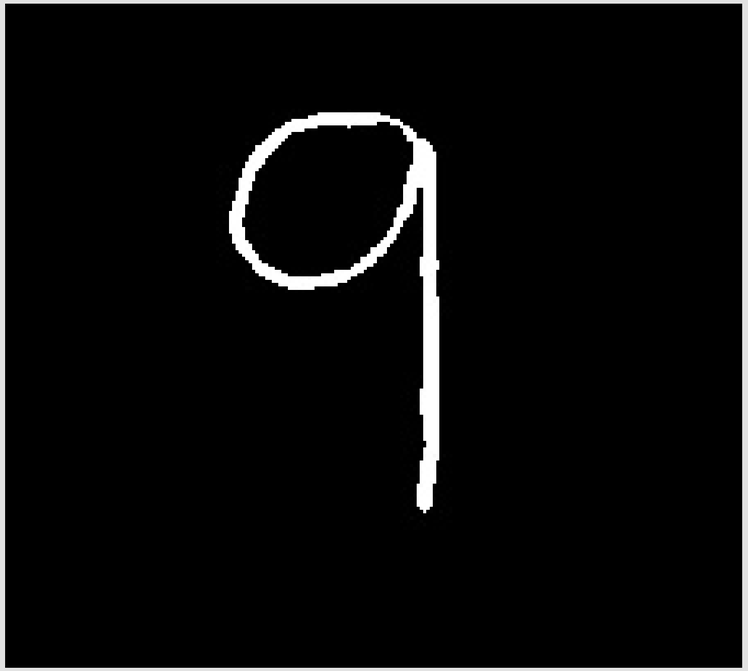
# Sudoku Image Processing







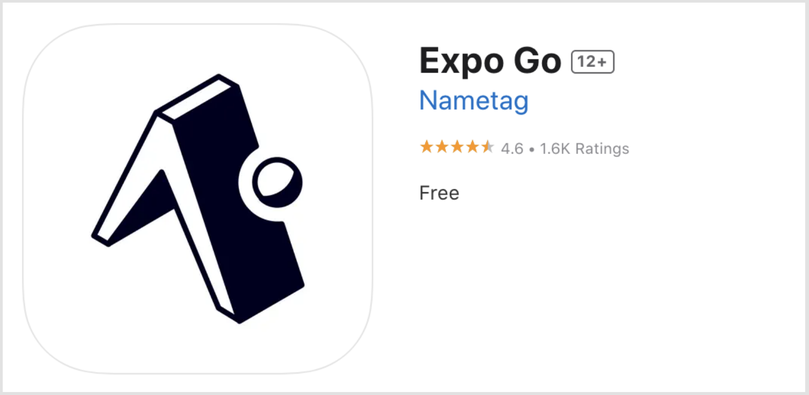




# Mobile Application Demo

Demo on PC

Download App to test on own device



# Future Improvements

## Offline App

REAL TIME SUDOKU GRID HIGHLIGHTING

OFFLINE PREDICTION

ROBUSTNESS AND MORE UTILITY

## Preprocessing

EXTRACT NUMBERS WITH MORE PRECISION

IMPROVE PRE-PROCESSING OF EXTRACTED IMAGES

SUPPORT FOR IF NUMBERS ARE WRITTEN ON EDGES

## Model Improvement

BETTER GENERALIZATION

WORKS ON BOTH HANDWRITTEN AND COMPUTER

HIGHER ACCURACY

CHECKING ILLEGAL MOVES AND REPROCESSING

# Thank you!

Reach out if you have questions.