

Lab 1: Introduction and Setup

Labs

- We will incrementally develop a complete deep learning codebase for understanding the content of handwritten paragraphs.
- Best framework: PyTorch + PyTorch-Lightning
- Best methods: CNNs + RNNs + Transformers
- Best experiment management: Weights & Biases
- Best way to deploy on the web: Docker + AWS Lambda
- Best way to monitor the model in production

Outline of the labs

- **Lab 1: Introduction.** Formulate problem, structure codebase, train an MLP on MNIST data.
- **Lab 2: CNNs.** Introduce EMNIST, generate synthetic handwritten lines, and train CNNs.
- **Lab 3: RNNs.** Using CNN + LSTM with CTC loss for line text recognition.
- **Lab 4: Transformers.** Using Transformers for line text recognition.
- **Lab 5: Experiment Management.** Real handwriting data, Weights & Biases, and hyperparameter sweeps.
- **Lab 6: Line Detection.** Train and evaluate line detection model (or paragraph recognition).
- **Lab 7: Data Management.** Label our own handwriting data and properly store it.
- **Lab 8: Continuous Integration.** Add continuous linting and testing of our code.
- **Lab 9: Deployment.** Run as a REST API locally, then in Docker, then put in production using AWS Lambda.
- **Lab 10: Monitoring.** Set up monitoring that alerts us when the incoming data distribution changes.

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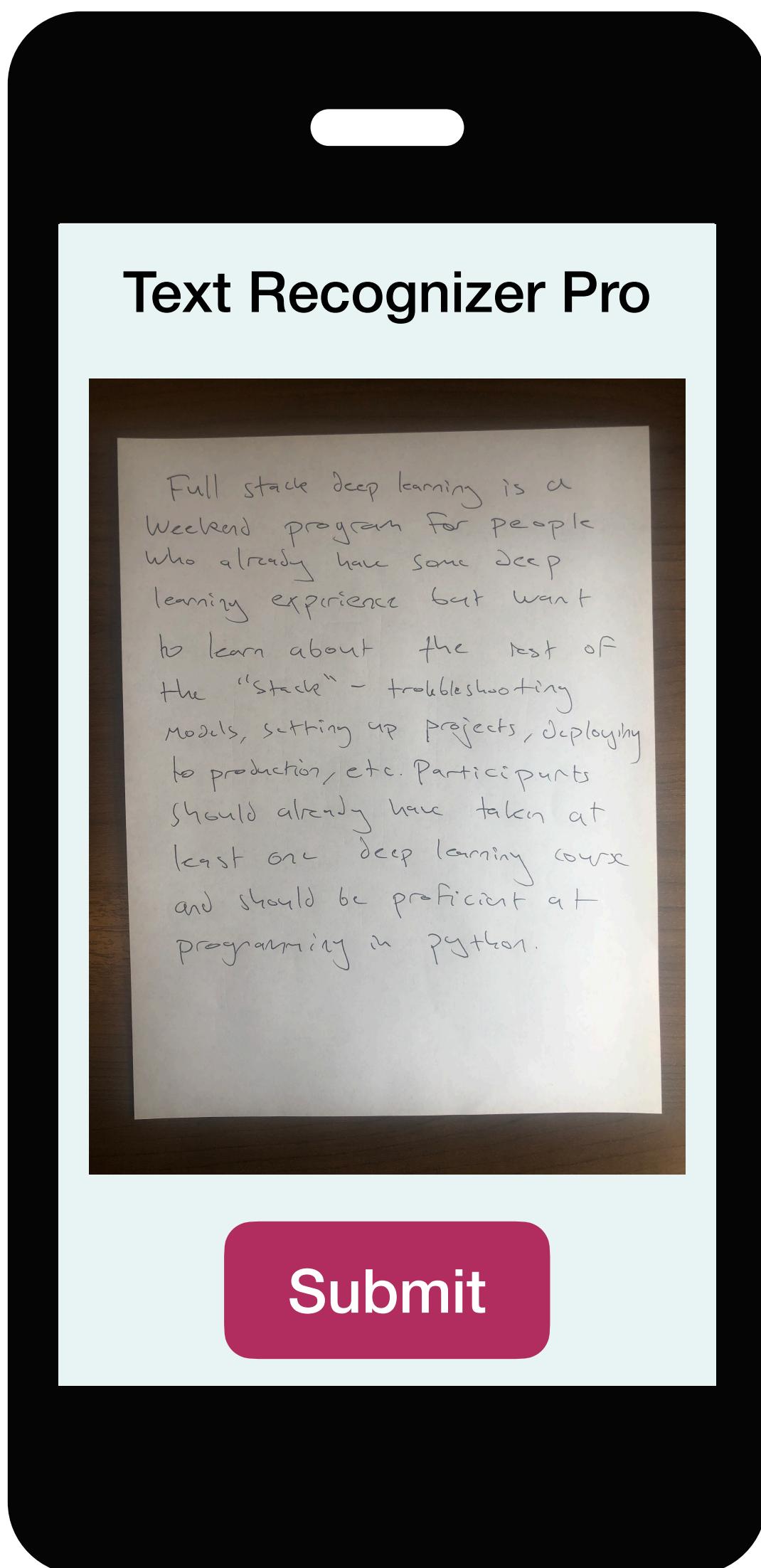
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Lab 1 Goals

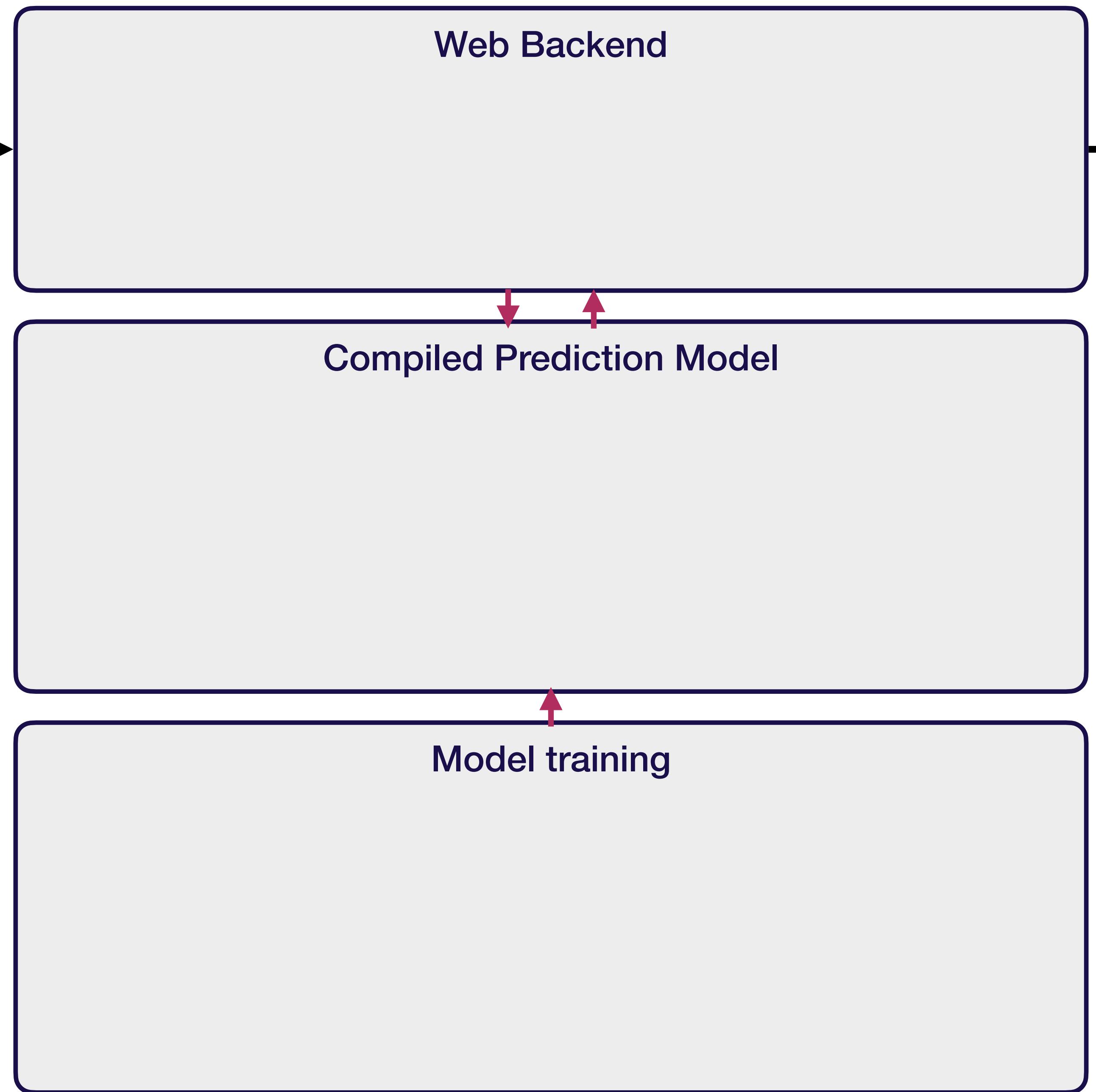
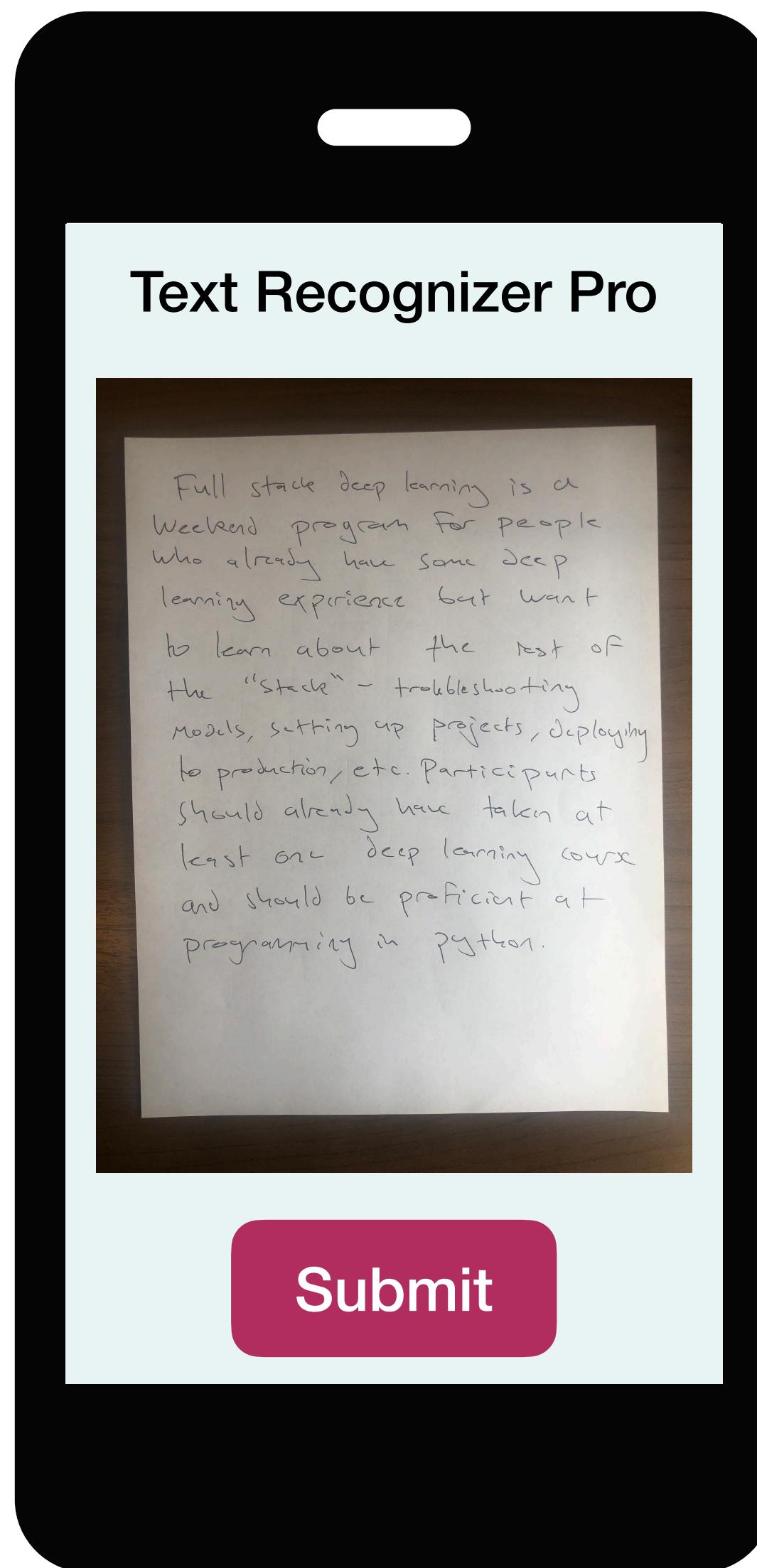
- Understand the problem and path to solution
- Set up our computing environment
- Review codebase and train on MNIST

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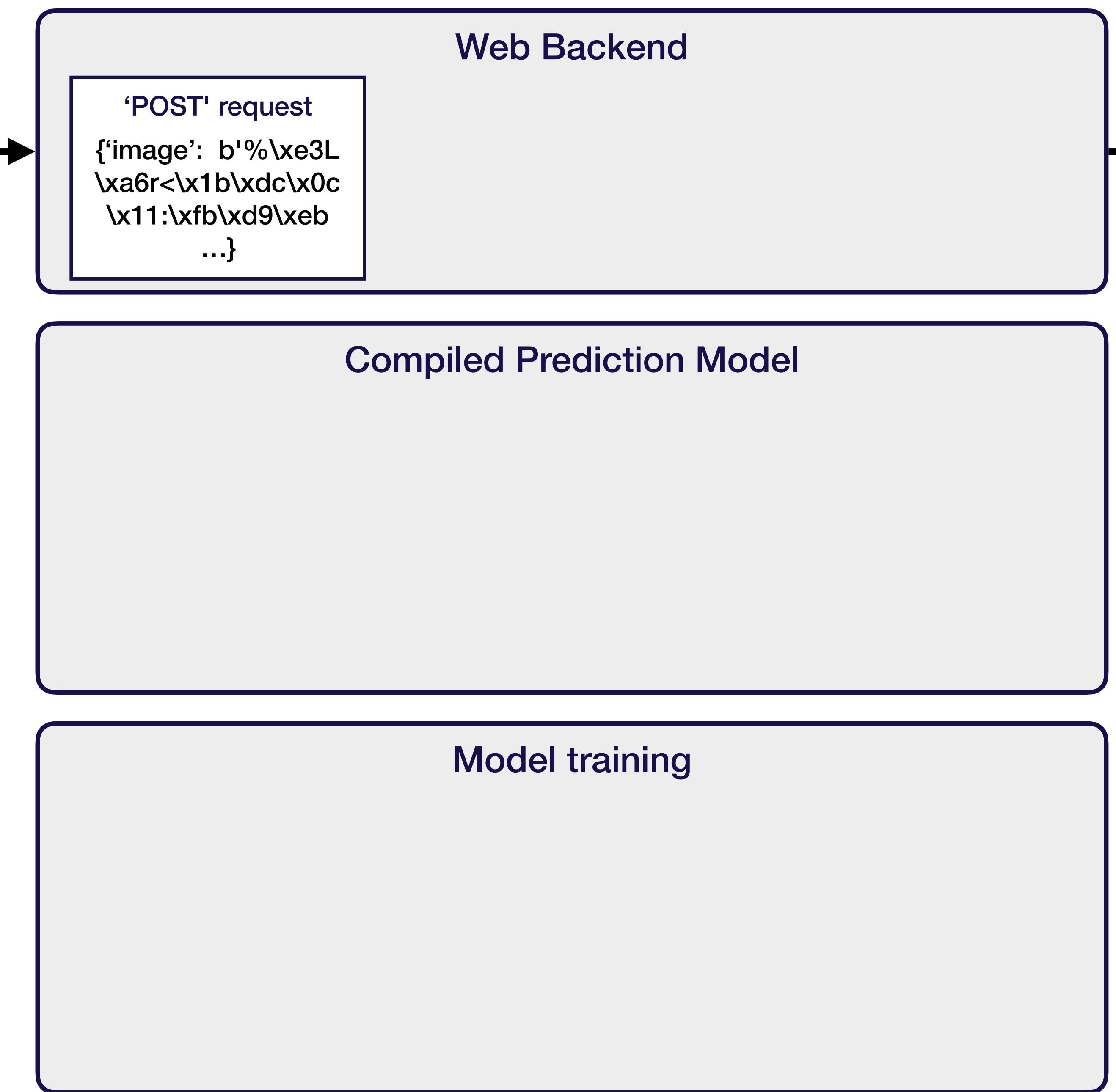
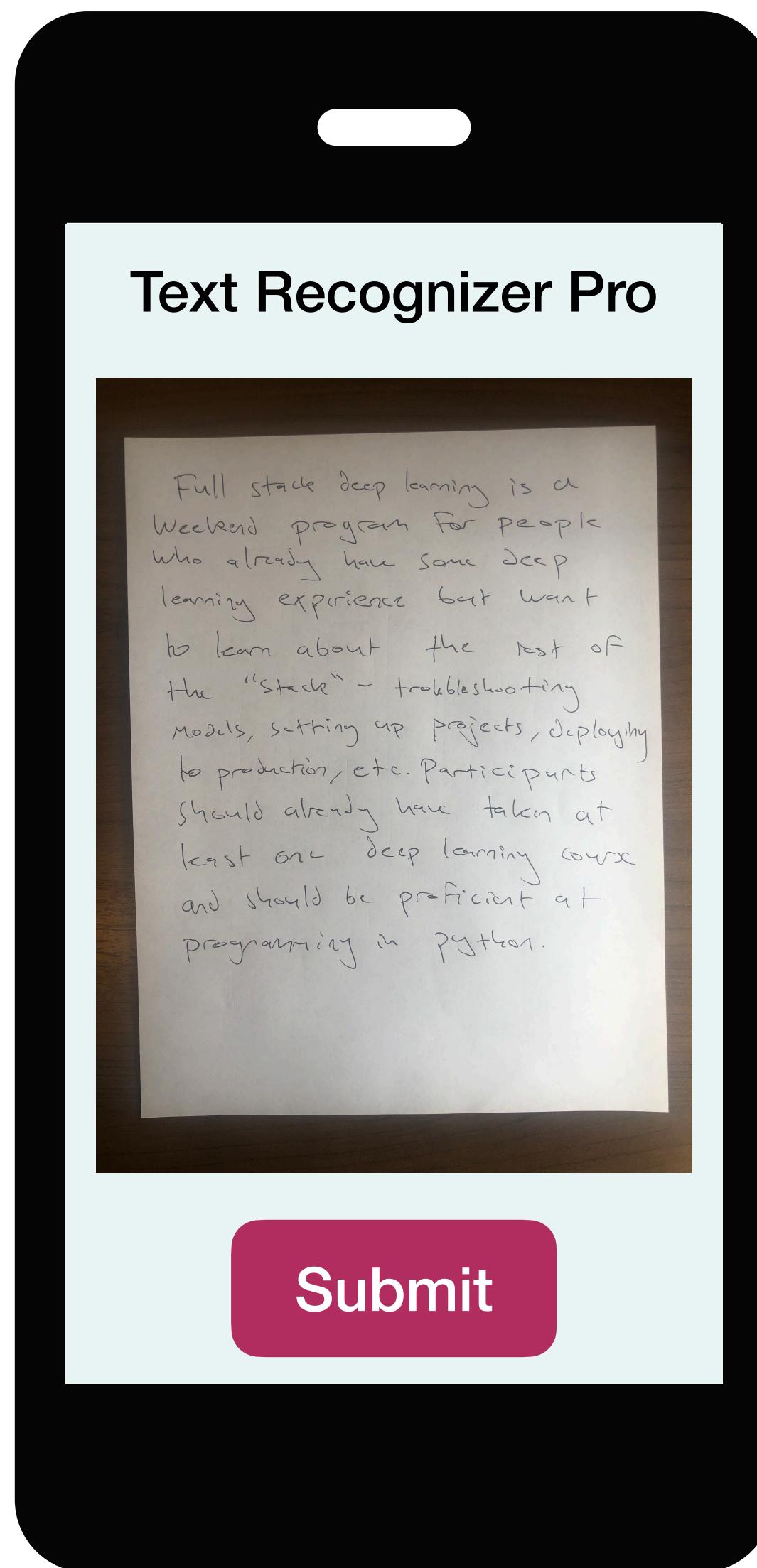
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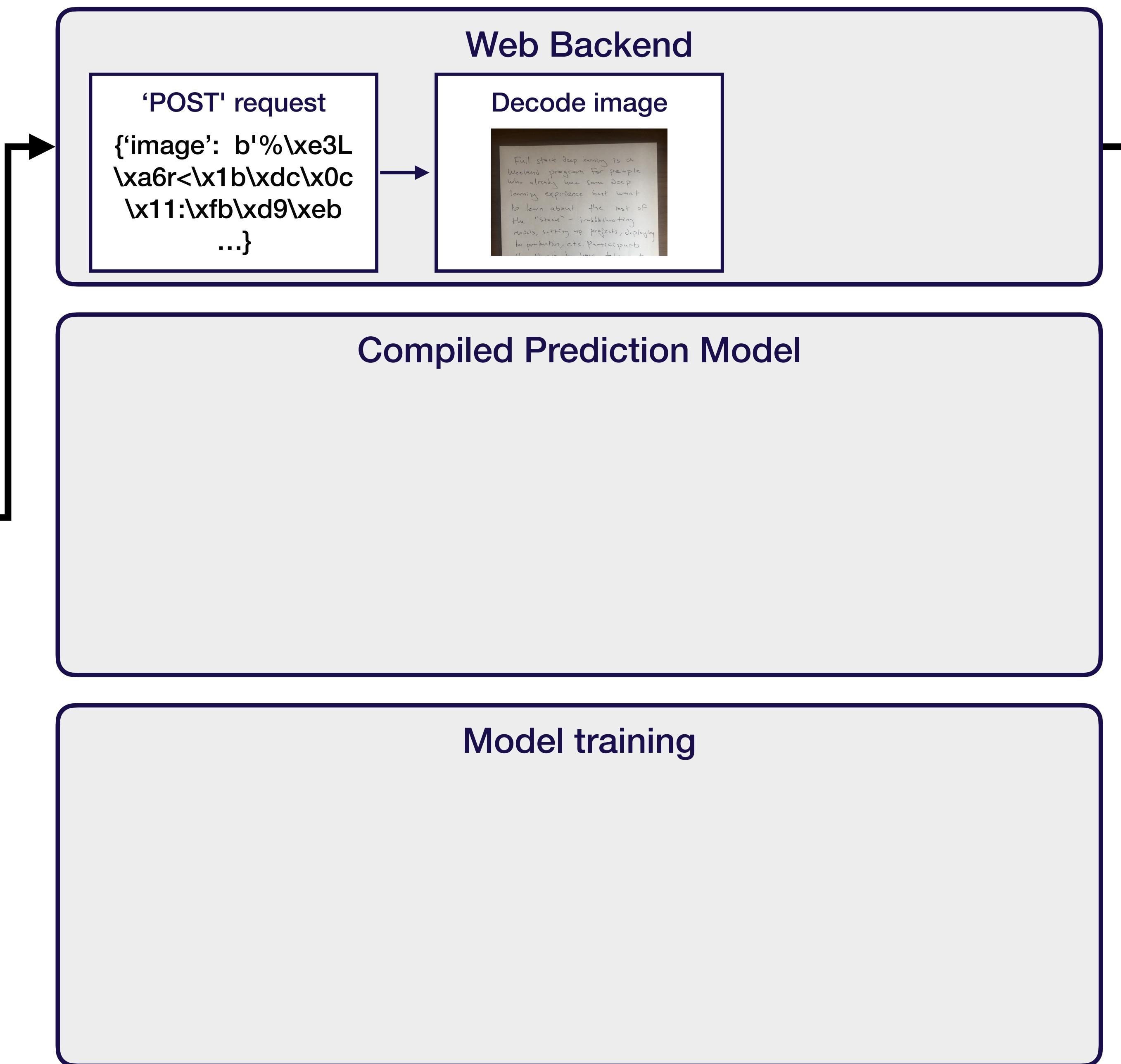
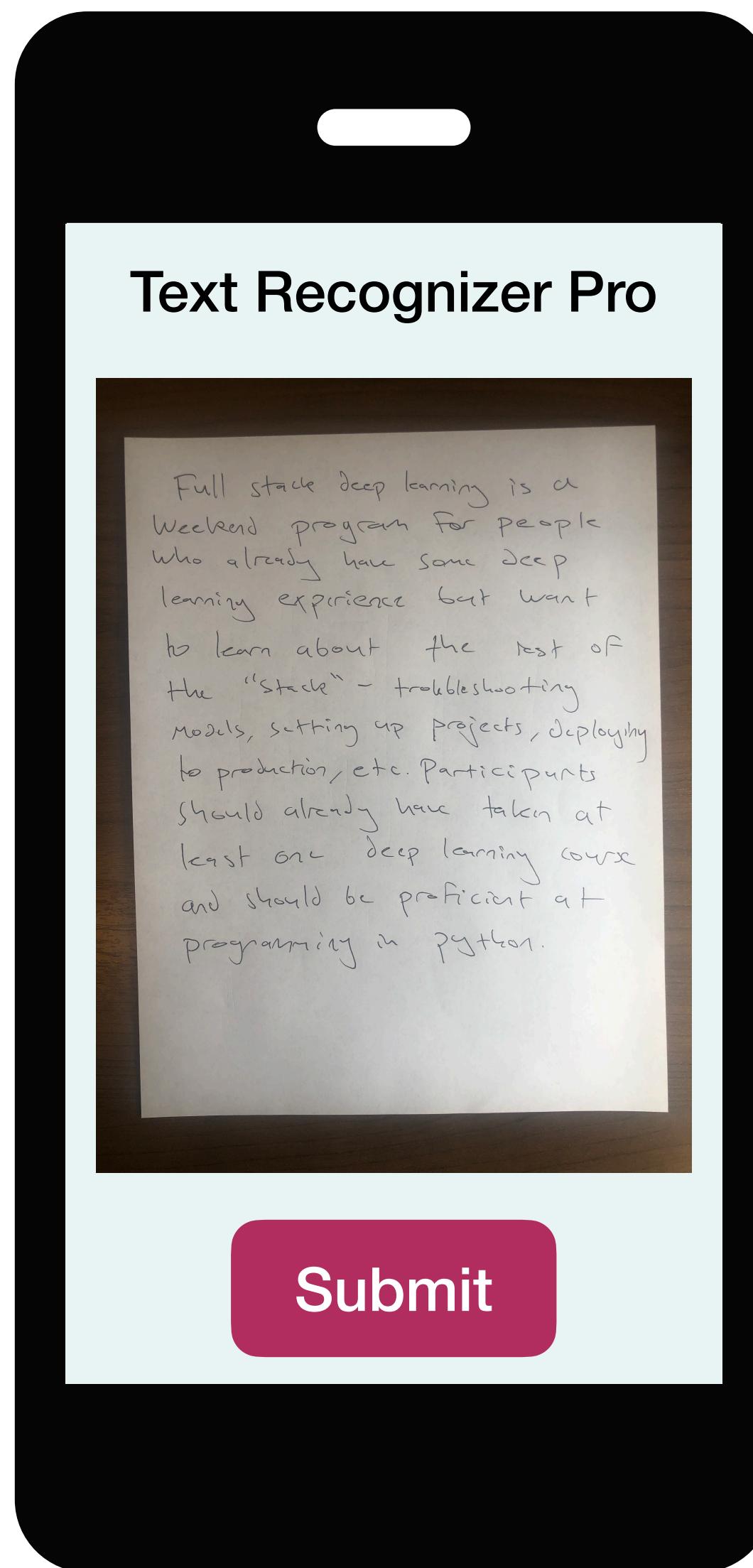
Full stack deep learning is a weekend program for people who already have some deep learning experience but want to learn about the rest of the "stack" ...

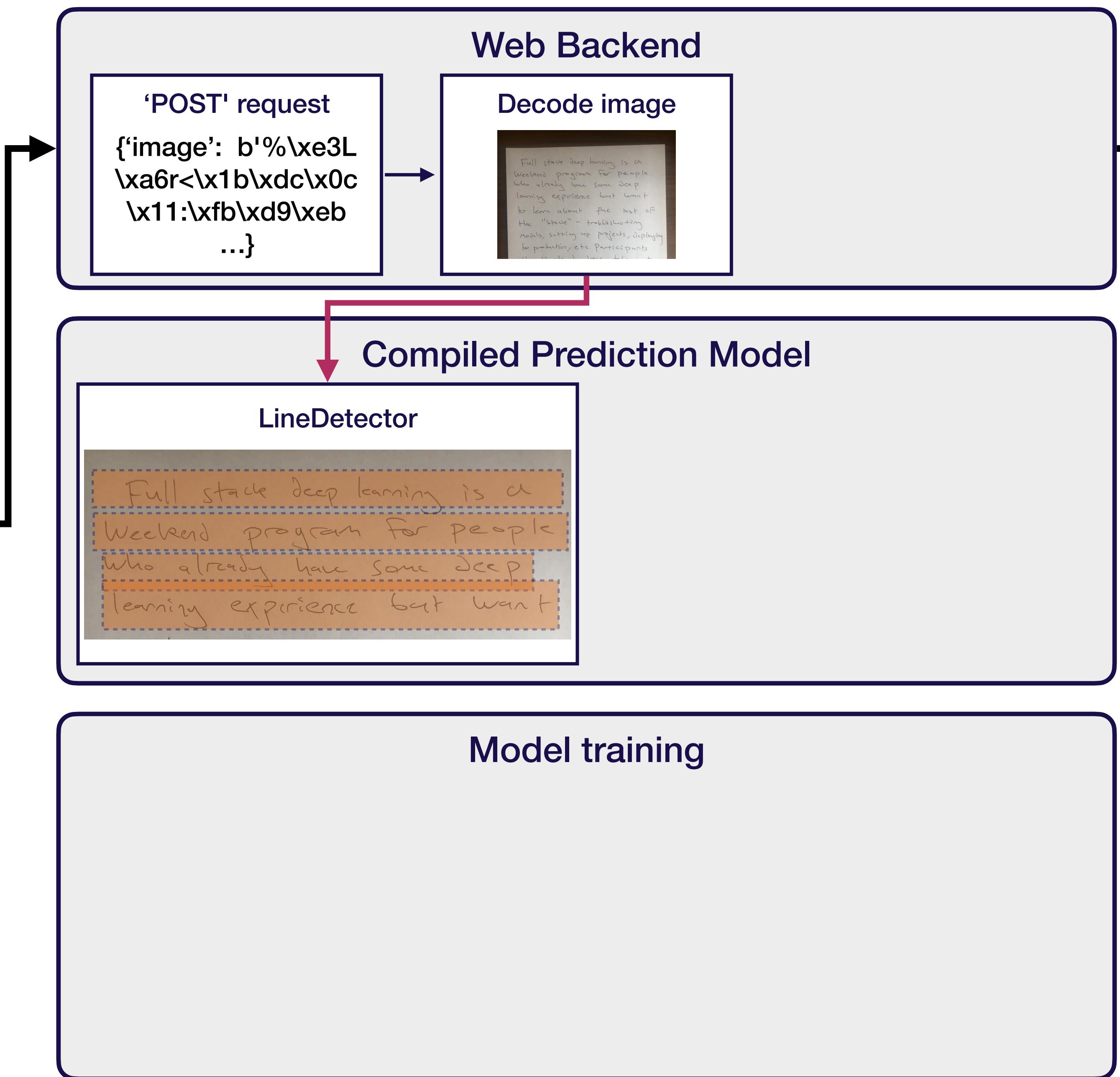
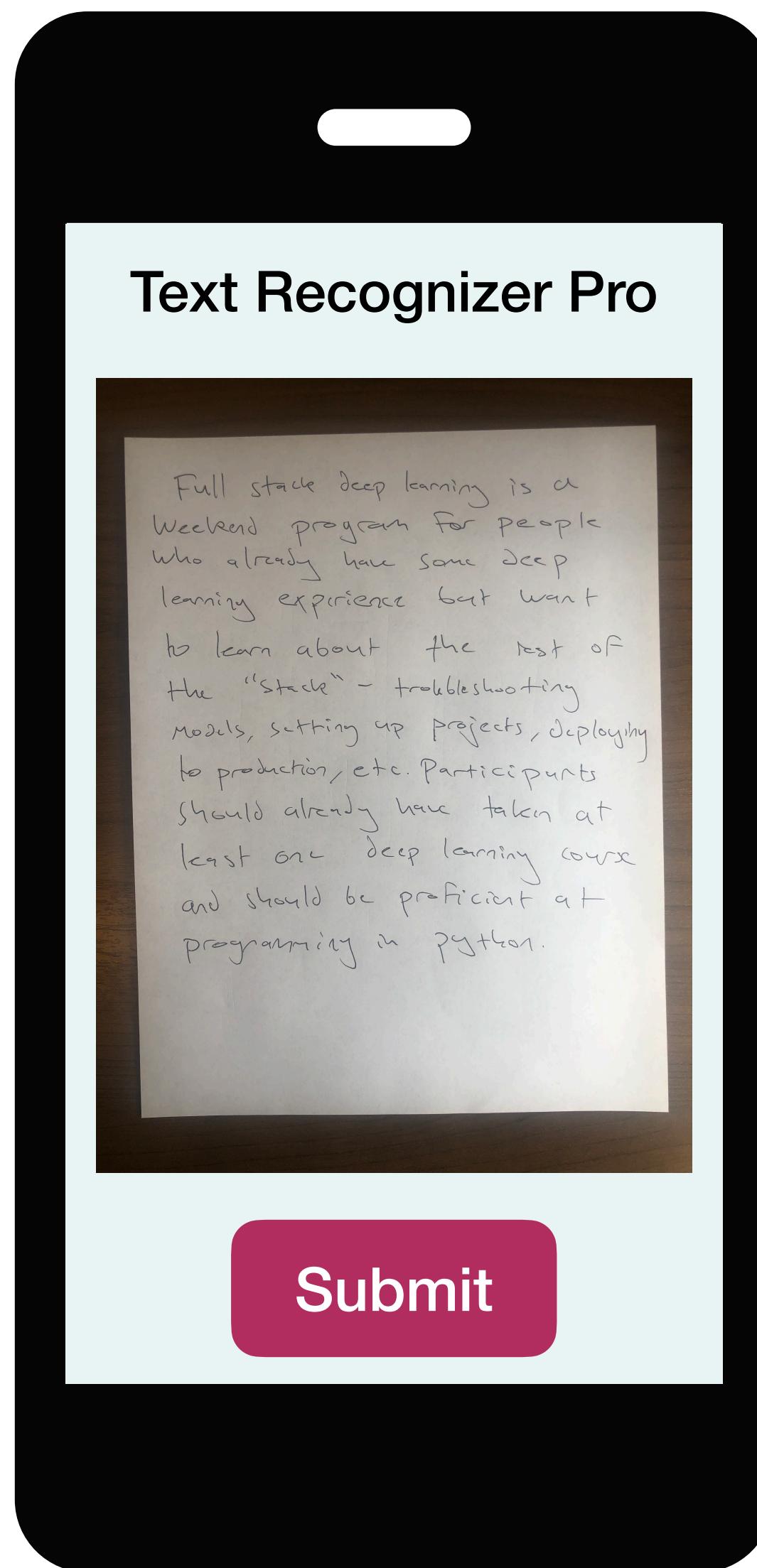


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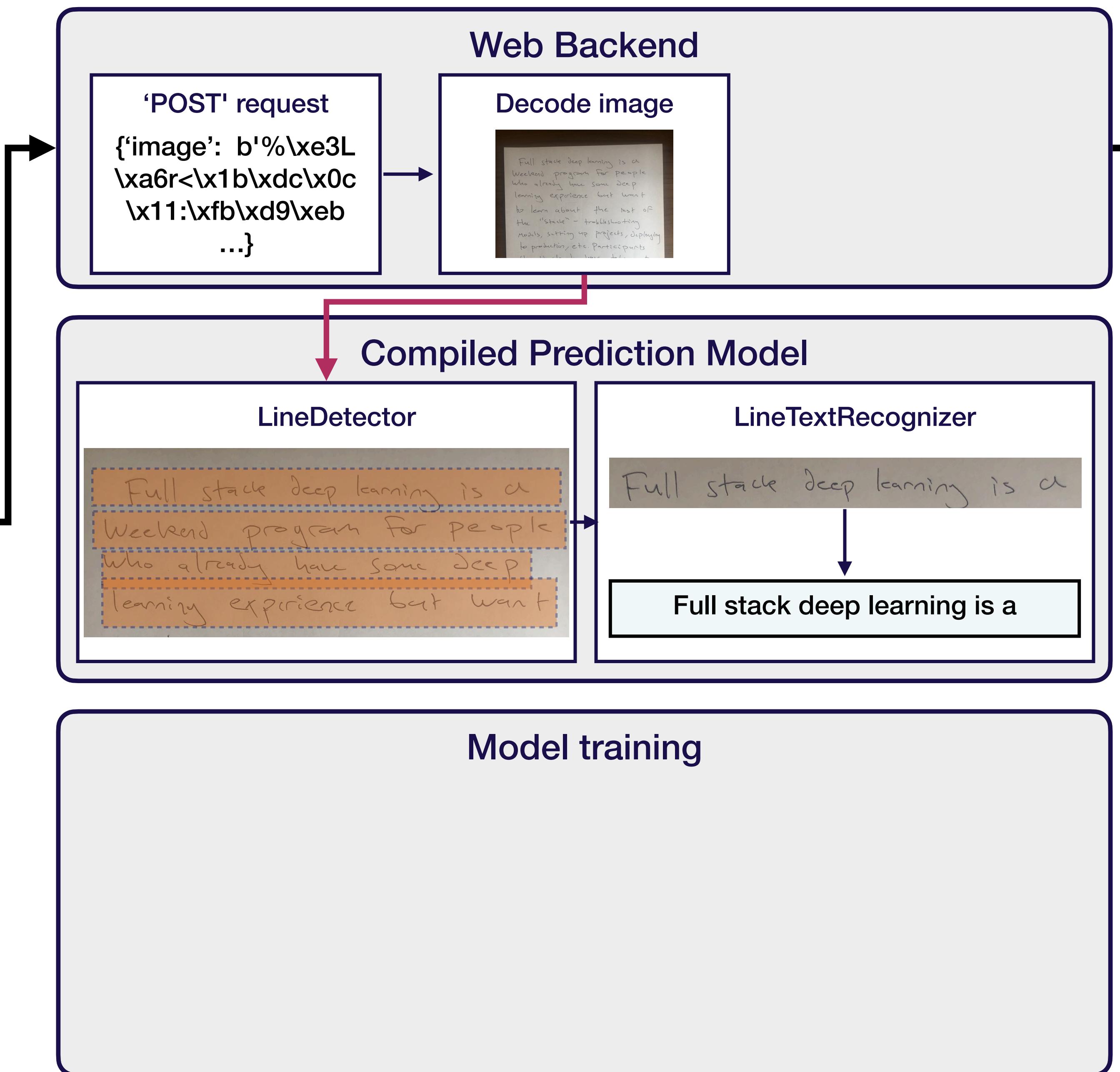
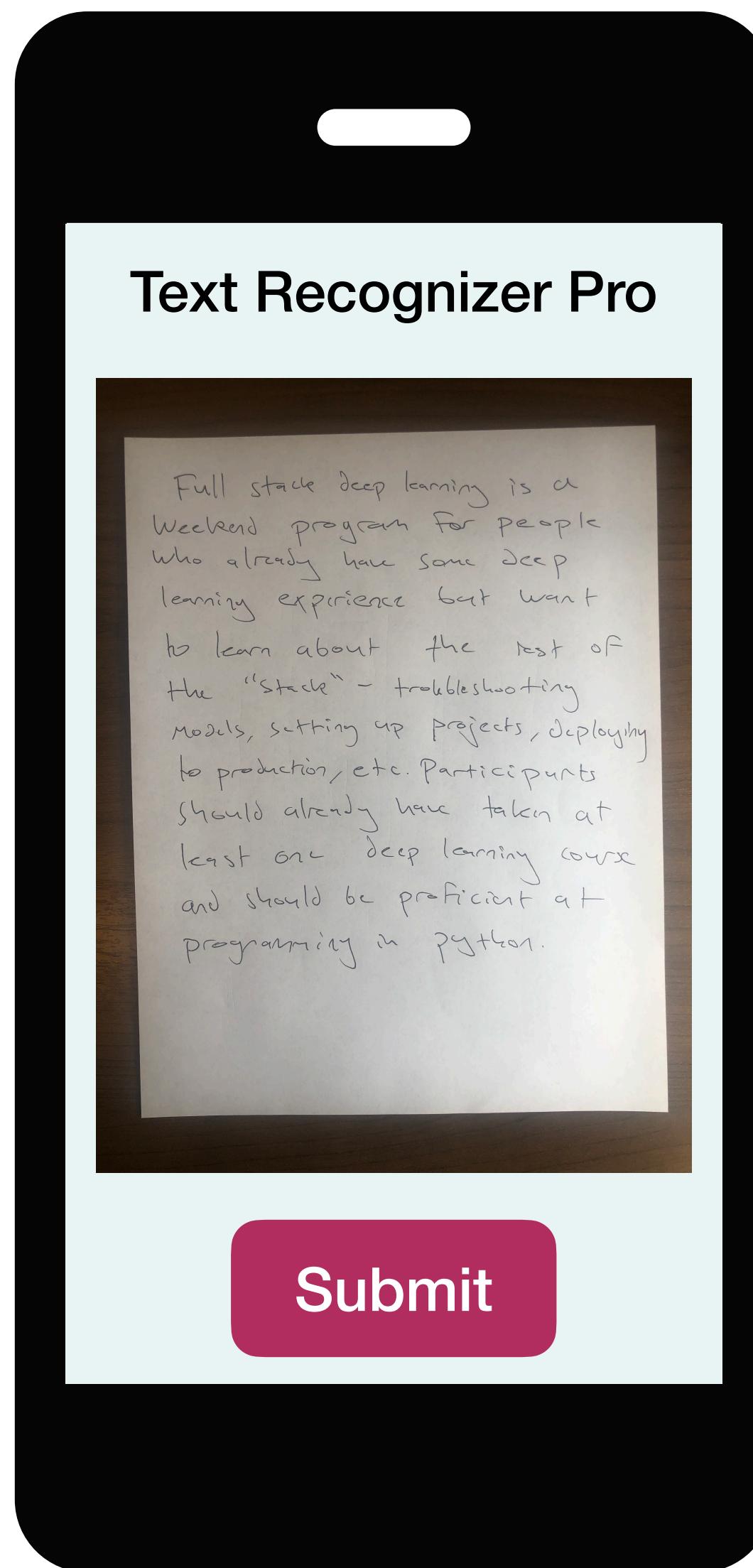


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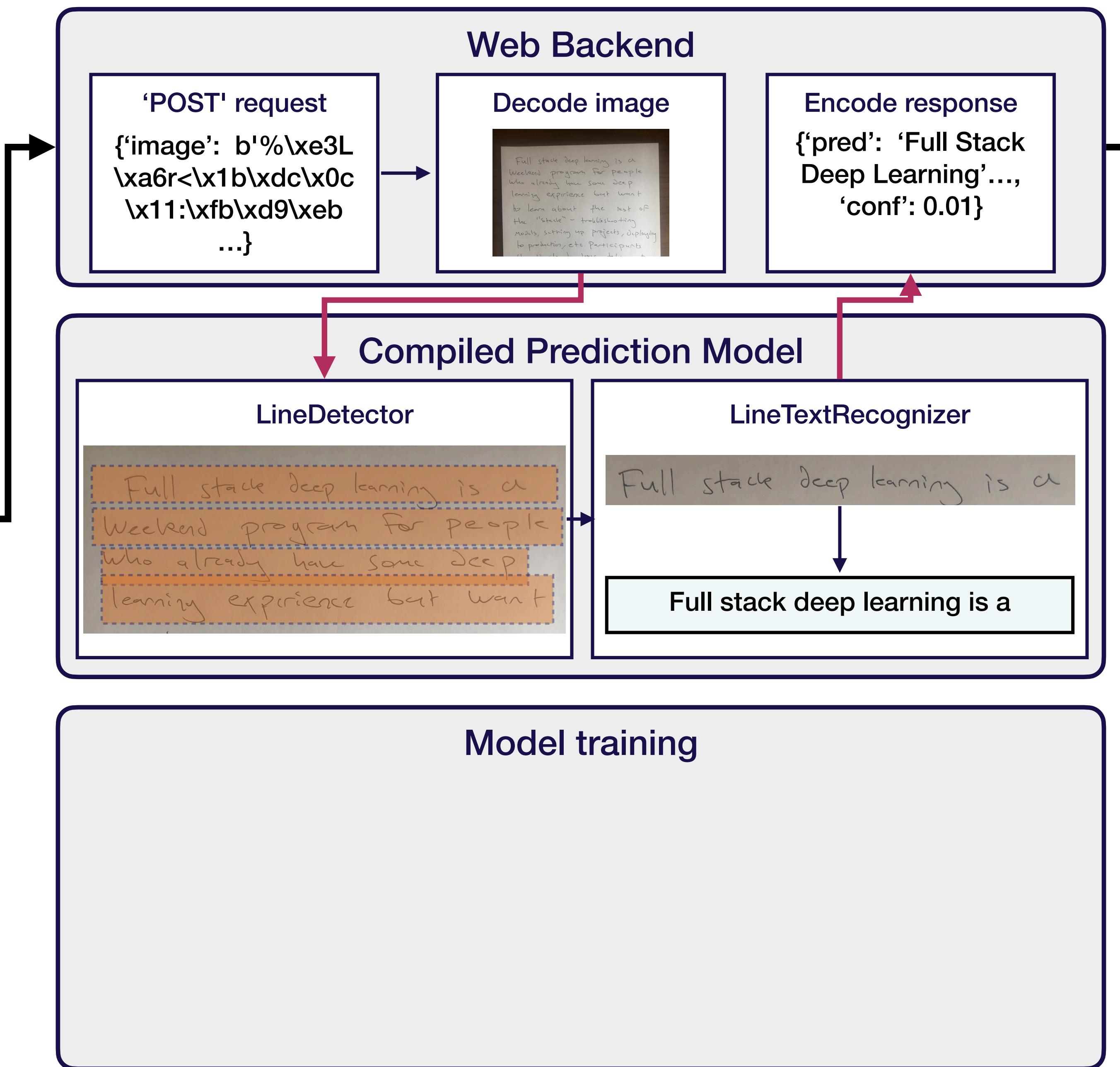
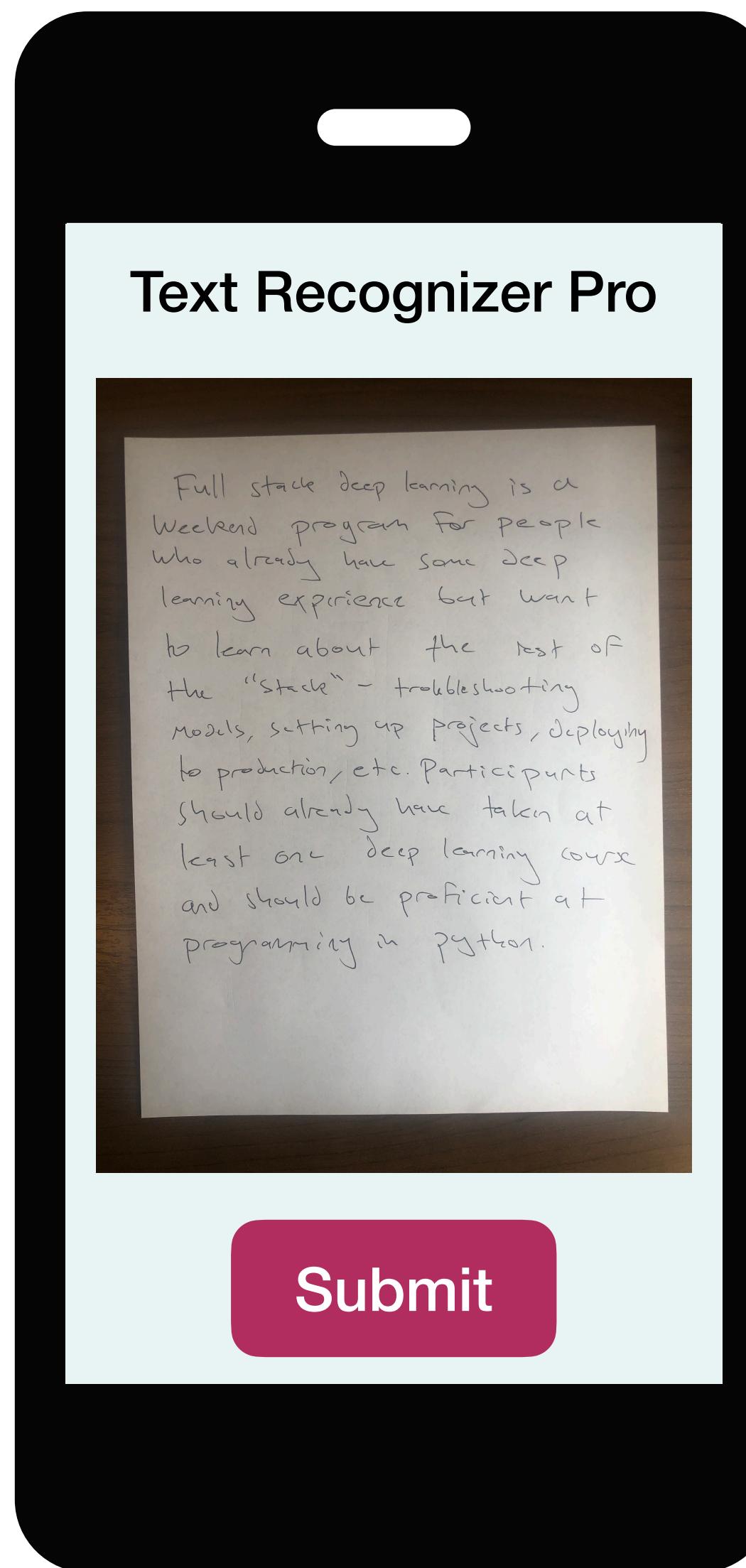




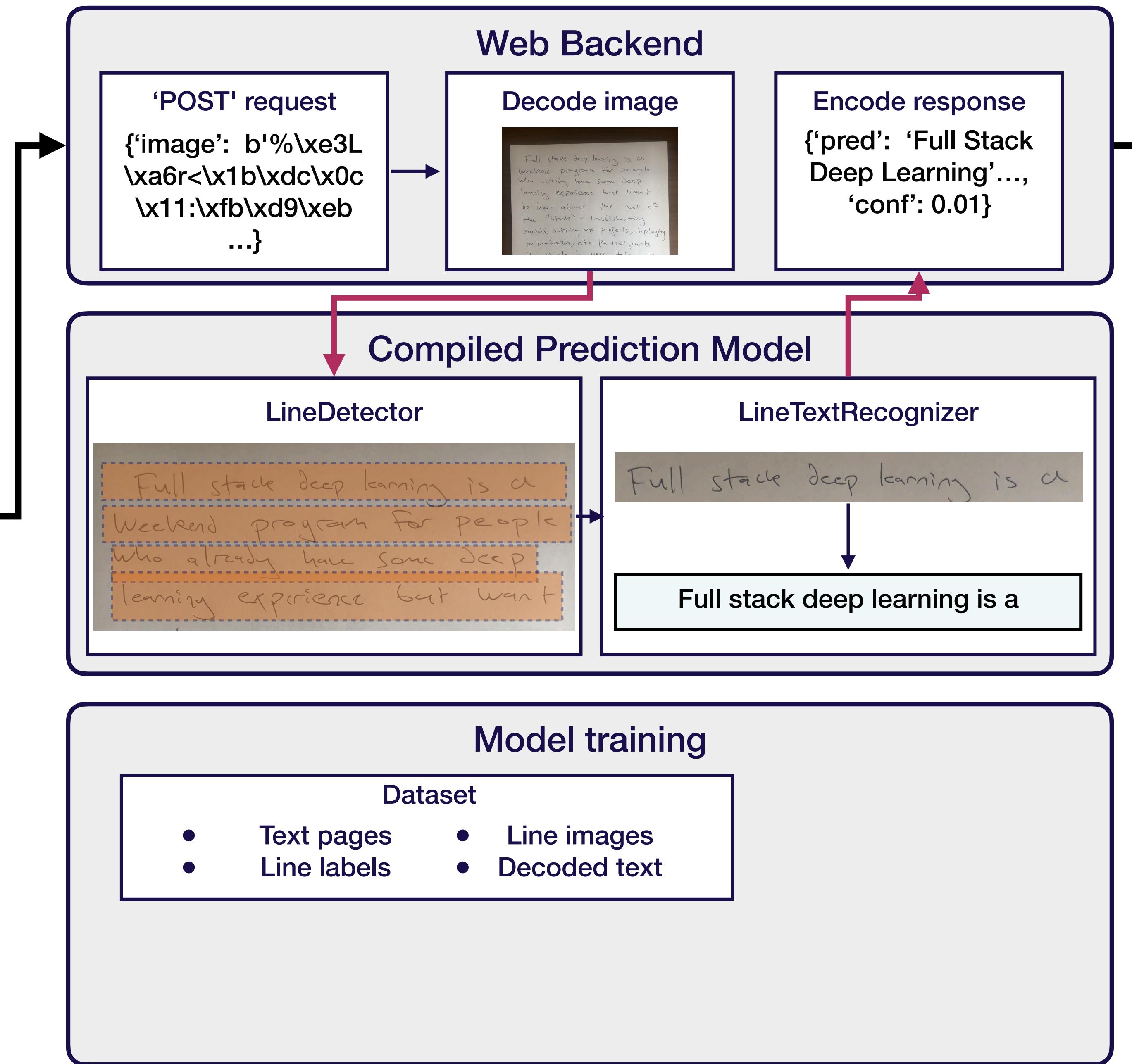
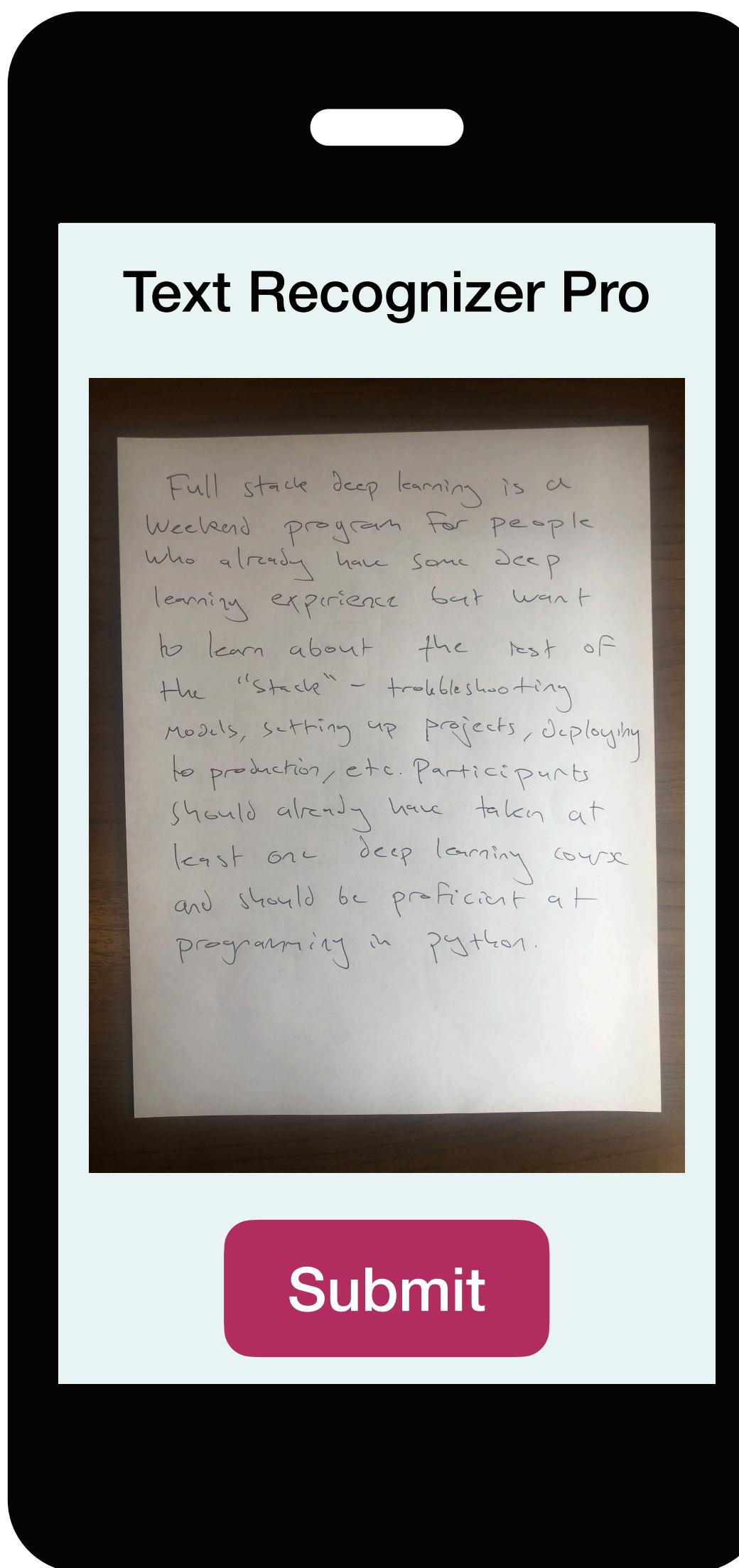
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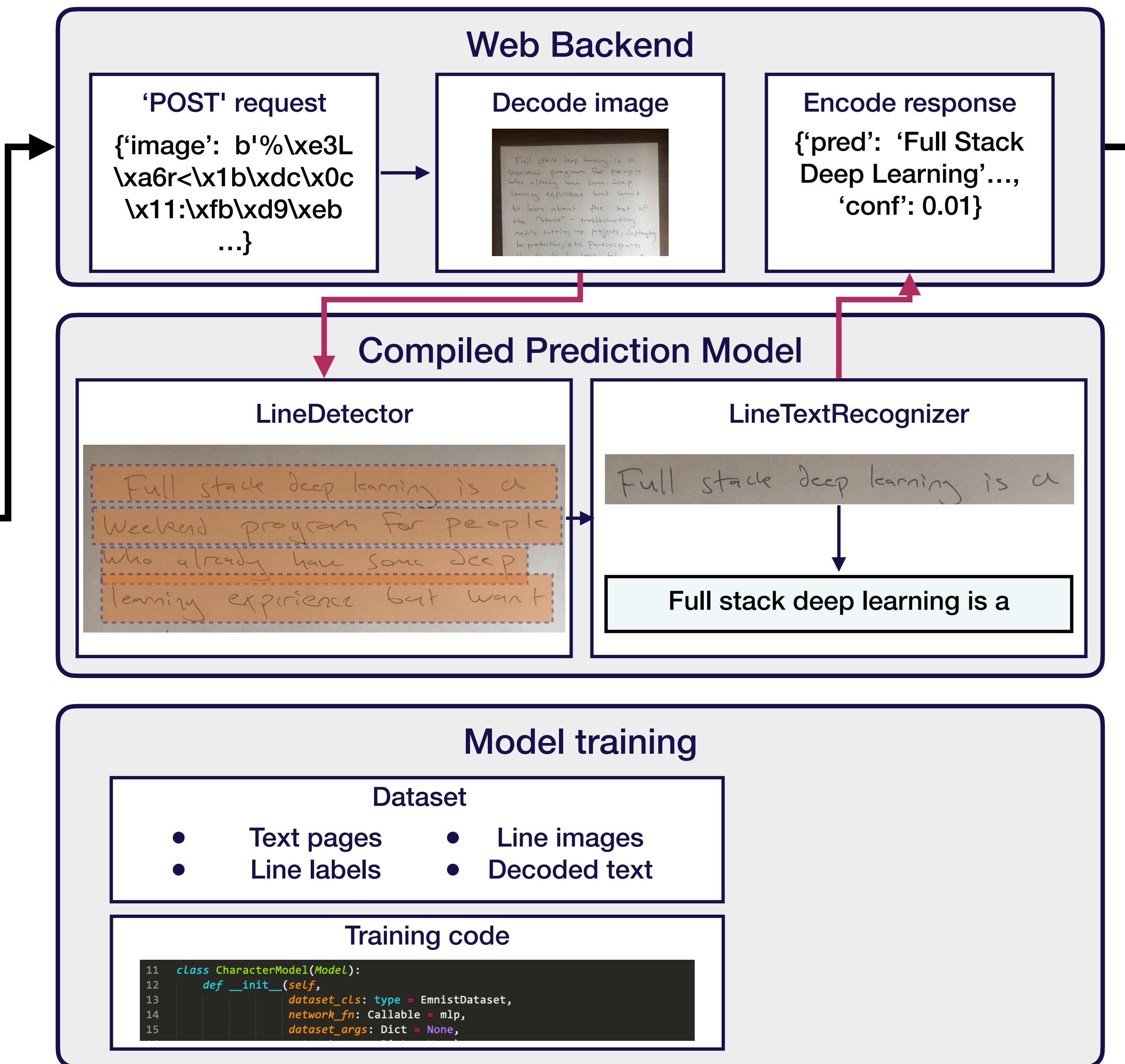
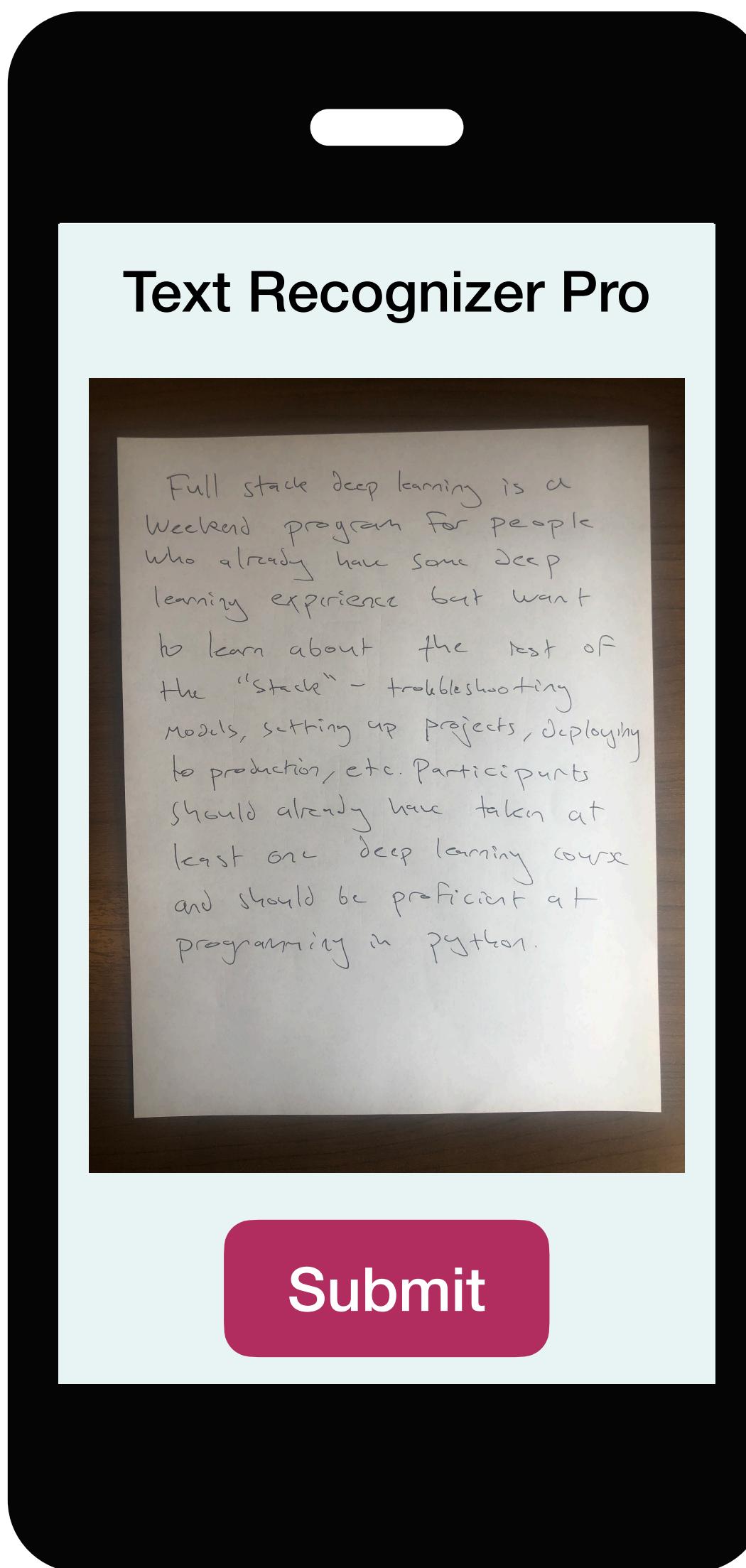
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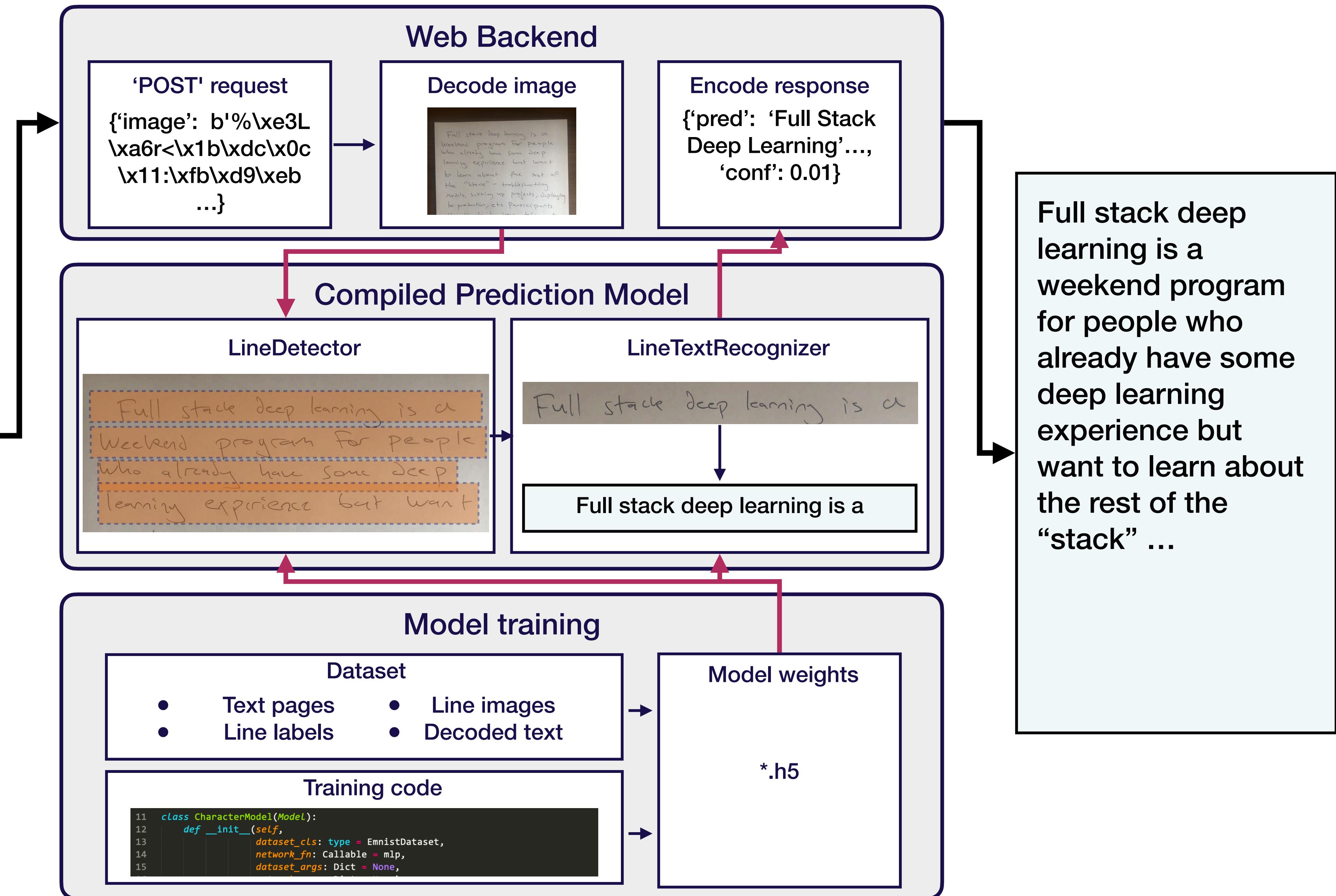
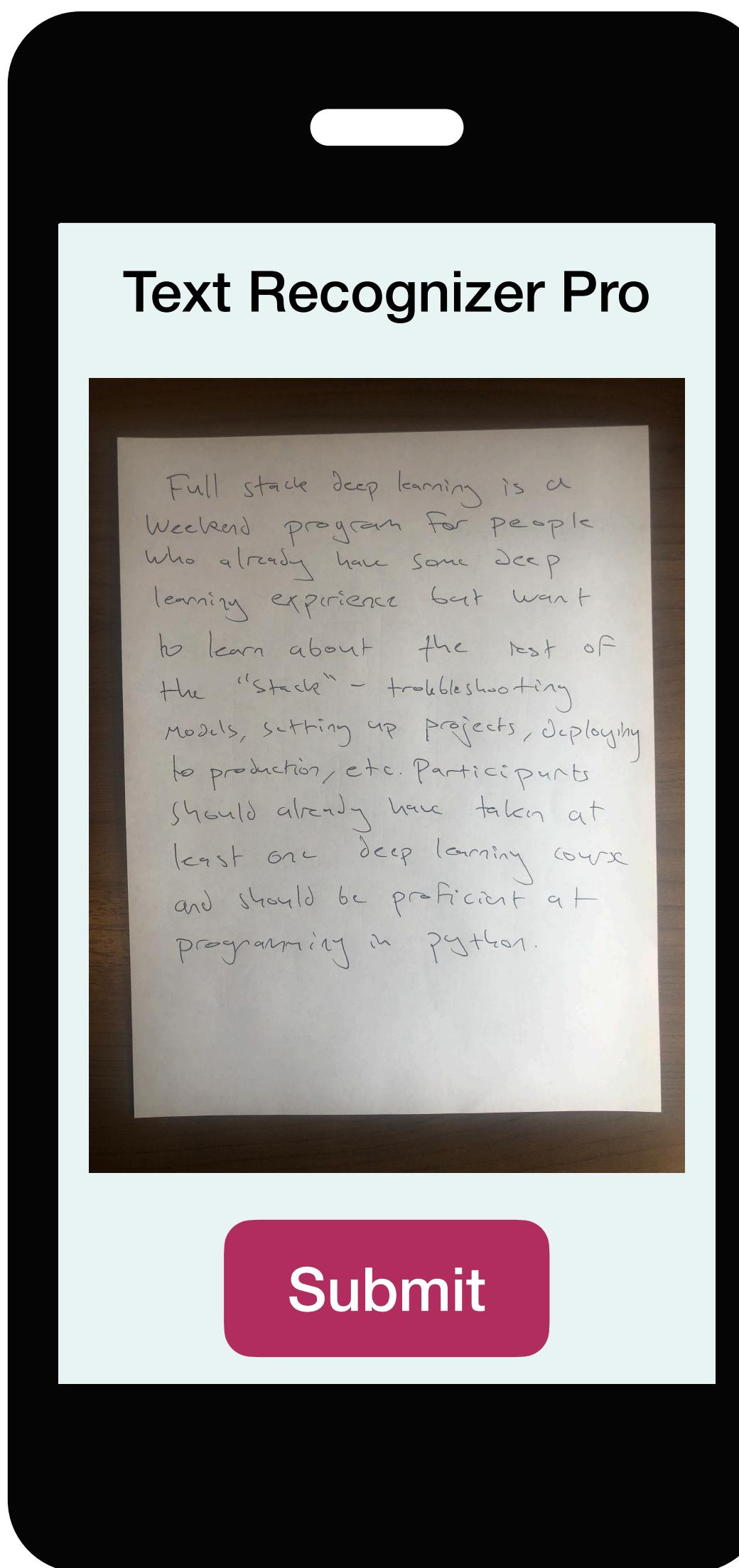
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Questions?

Lab 1 Goals

- Understand the problem and path to solution
- **Set up our computing environment**
- Review codebase and train on MNIST

Set up computing environment

- [Readme](#)
- [Colab setup video](#)

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Review Codebase and Train on MNIST

- Readme
- Video walkthrough

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