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Machine Learning Onsite Interview Guide

Interview Overview

Since you have completed the initial technical screen, you have already received a great start on preparing for your onsite interview. Much of the first section of this document will look familiar to you since preparing for an onsite interview involves many of the same steps as preparing for an initial tech screen.

This onsite interview guide contains everything you will need to practice and prepare for. If you have any additional questions, feel free to contact your recruiter.

During the onsite interview, you will be evaluated on three interview types:

- **Data Structures & Algorithms**
- **Machine Learning Practitioner**
- **Competency**

Data Structures & Algorithms (45 min)

Be prepared to have **two** 45-minute coding rounds, with the key difference involving more difficult questions. Interviewers may ask for more in-depth follow-up questions to assess your solution and thought process.

We will describe a tightly-scoped problem and ask you to come up with a programming solution to it. We are looking for clean, well-organized code. As an ML Engineer at Pinterest, you will be writing code and doing code reviews. We would like to see you can break down a problem methodically and write solid, production quality code to solve it.

- Make sure you ask clarifying questions before jumping in and communicate your thought process & approach the entire time
- This interview will be similar in structure to the first round, which consisted of a 60-minute technical screening assessing machine learning fundamentals and included a coding exercise. In this round, however, you'll have 45 minutes to solve 1-2 coding problems.

You will be evaluated on the following focus areas:

- **Communication/Requirement Gathering/Incorporating Feedback**
    - Your ability to articulate the solution you intend to propose, asking for requirements and clarity when necessary, and your ability to change direction when needed based on feedback.

- **Problem Solving**
  - Your ability to propose a working solution, conversations around trade-offs in the solution you choose, using appropriate data structures, consideration of space and time complexity, and optimizing your solution.

- **Coding**
  - Cleanliness of your code, syntax, naming conventions, and modularity.

- **Verification**
  - Ability to debug (if applicable), and develop test cases for your code. Attention to edge cases is especially important.

Best practices

As coding will be the majority of the onsite loop, here are a few items to keep in mind as you prepare.

- **Breadth over depth**
  - Practice solving fewer example problems of different problem types. Being able to solve a variety of problems will allow you to be comfortable with the different problems that may be presented.

- **Plan then Code**
  - Interviewers will expect you to create well-structured code. Taking a minute to gather your thoughts and formulate a plan will help you to build a clean code structure from the start.

- **Narrate as you go**
  - Interviewers will evaluate you on your thought process as well as coding. Explain your decisions as you code to help them understand your frame of mind.

- **Iterate**
  - Talk through multiple possible solutions, then decide which will work best. Do not try to go for the most clever solution immediately.

- **Some problems may focus on edge cases**
  - You might be asked to parse some data format or mini-language.

- **Set time constraints while practicing**

    - Practice solving problems in less than 20-30 minutes. This will help you operate with efficiency and mimic the interview setting.

- **Decide on what resources to use**
    - There is no shortage of preparation websites out there, here are a few others have found success with:
        - InterviewBit
        - LeetCode
        - HackerRank
        - CodeRust

ML Practitioner (60 min)

This portion of your onsite interview will consist of **two** 60-minute sessions assessing your ability to develop and own models from start to finish.

You will be evaluated on the following focus areas:

- **Problem Exploration:** Your ability to think from first principles, and articulate the problem you are trying to solve; framing it as a machine learning problem.
- **Training Data/Data Set Generation:** Identifying methods to collect training data, and conversations around constraints/risks. Identifying and describing the labels used, and justifying their choice.
- **Model Selection:** Describe the ML model(s) you want to use. Expect to answer knowledge questions around your selected models. This may include describing the loss function, and tradeoffs in the model(s) you choose.
- **Feature Engineering:** Identifying relevant ML features for your model and describing how to build these features.
- **Evaluation:** How you would measure the success of the model you intend to propose.

How to Practice

In your preparation, you should brush up on basic ML theory, and details of common models and algorithms.

Practice designing a solution to common ML problems. Think through each aspect of the problem. Convert feature ideas into concrete implementations, and consider how your solution would work in a production environment. Also consider whether there are clarifying questions you can ask an interviewer to gain more specificity around the problem setup.

While practicing, you can consider modeling problems in ML domains that might be encountered in building Pinterest, including:

- Recommendation systems
- Personalized content ranking
- Content understanding

Competency (45 min)

This portion of your onsite interview will consist of a single 45-minute behavioral interview with an ML leader/hiring manager.

Our mission is to bring everyone the inspiration to create a life they love and our core company values bring Pinterest to life. Your interviewer will want to learn about your background and interests, what you're passionate about in tech, what kind of impact you want to make, and how you align with our values: Put Pinners First, Aim for Extraordinary, Create Belonging, Act as One, and Win or Learn. We also want to know about your overall interest in joining Pinterest, what it's like to work with you every day, what kind of a colleague and/or leader you are, and how you handle challenges.

What We Ask

We may ask you to:

- Discuss anything that's on your resume, including current projects and details. Provide specific examples about what you did and the resulting impact.
- Critique yourself and share what you learned from a past situation.
- Talk about what you like about your current role and/or being an engineer.
- Discuss why you would like to make a change and why you are interested in joining Pinterest.

How to Prepare

Just like with coding and design interviews, it's important to prepare ahead of time for interviews designed to get to know you better.

Determine what stories you want to share

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Start by identifying examples of situations where your behaviors or actions have resulted in positive outcomes or illustrate your skills in leadership, teamwork, planning, and taking initiative.

Think beyond your work experience. You can share examples of coursework, internships, hobby projects, volunteer work, etc. If possible, include different types of examples to showcase the breadth of your skills in different situations.

Think about challenges and what you've learned. Think through the tough situations you've faced and explain what you've learned from each. Keep in mind that sharing some examples with negative results can effectively highlight your strengths in the face of adversity and showcase your openness to learn and grow.

Be specific. Instead of generalizing about several events, give a detailed account of one event. Consider being metrics/impact oriented in that specific account with the interviewer.

Be honest. Don't embellish or omit any part of the story. The interviewer will be able to see if your answer is built on a weak foundation.

Use the STAR format

Write out five to seven examples of your successes using the STAR format outlined below. Writing these out before your interview will help you recall all the details and stay on track when you tell your story in the interview, and the STAR approach will help you frame each story you share with a beginning, middle, and end. You can use these stories to answer almost any question in this portion of your interview.

Situation: Describe the situation you were in or the task you needed to accomplish. This situation can be from a previous job, volunteer experience, or any relevant event.

Task: What was your specific goal? How did your goal impact any larger project goals or outcomes?

Action: What specific steps did you take to achieve your goal? What obstacles did you encounter, and what steps did you take to overcome them? (Focus on your individual contribution and not the team's accomplishments. Say 'I' not 'we.')

Result: Describe the outcome of your actions, and don't be shy about taking credit. What happened? What did you accomplish and learn? Help the interviewer understand why these results were important.

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Additional Interviewing Tips & Resources

We will use Google Meet to connect over video. Be sure to have a computer with reliable internet connection.

Familiarize yourself with the tools being used for interviewing beforehand. You will have access to Coderpad for our interview coding environment and Coderpad Draw for ML Systems Design. If you prefer to use another whiteboard tool, you are welcome to do so.

If you require a medical or religious accommodation during the job application process, please complete this form for support.

Pinterest Engineering Resources:

- Pinterest Labs
- Pinterest Eng Blog
- Pinterest Publications
- Pinterest Labs Talk Series
- Pinterest 2024 Machine Learning Day Recordings
- Here are some publications and blogs:
    - Interviewing at Pinterest - Blog Post
    - Pinterest Eng Culture
    - Machine Learning blog posts
    - Visual Discovery at Pinterest
    - Recommender Systems and User Modeling at Pinterest
    - Monetization blog posts
    - Infrastructure blog posts (may help with prep for system design/architecture interviews)
    - Machine Learning Interview Guide for Systems Design
- Ads Prep Material:
    - Pinterest Ads Modeling & Marketplace Workshop Recordings
    - Marketplace in Motion
    - Shareholder Letters

Machine Learning Resources:

- Rules of ML: Best Practices for ML Engineering
- HNSW: Efficient and robust approximate nearest neighbor search using Hierarchical Navigable Small World graphs
- An update on Pixie, Pinterest's recommendation system
- Two Tower NN architecture for retrieval: Deep Neural Networks for YouTube Recommendations
- Instagram personalized recommendations

- The User and Business Impact of Server Delays, Additional Bytes, and HTTP Chunking in Web Search Presentation
- Performance Related Changes and their User Impact (on Bing Search and Google Search latencies business impact)
- Large-scale Reinforcement Learning for Diffusion Models
- User Sequence Modeling Architecture for Ads Ranking
- PinnerSage: Multi-Modal User Embedding Framework for Recommendations at Pinterest
- OmniSearchSage: Multi-Task Multi-Entity Embeddings for Pinterest Search
- TransAct: Transformer-based Realtime User Action Model for Recommendation at Pinterest
- ItemSage: Learning Product Embeddings for Shopping Recommendations at Pinterest
- PinnerFormer: Sequence Modeling for User Representation at Pinterest
- PinSage: A new graph convolutional neural network for web-scale recommender systems
- Graph Convolutional Neural Networks for Web-Scale Recommender Systems
- More can be found here

Inclusion and Belonging at Pinterest:

- Inclusion & Belonging + Impact
    - 2023 I+D Executive Summary
    - 2024 Pinterest ESG Impact Report - Our Pinclusion Philosophy
    - Pinclusion Groups
    - Building a more positive platform
        - Body type technology, Skin tone Ranges, Hair pattern search
    - The Inspired Internet Pledge

Life at Pinterest:

- About Pinterest - A better feed that actually feeds the soul
- What is Pinterest?
- Working at Pinterest
- Interviewing at Pinterest
- Pinterest Mission, Values, and Benefits
- Pinterest Newsroom

If you have any questions, comments, or concerns, please feel free to reach out to your recruiter at any time!