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KAIST Technical Interview Workshop Part II

A short blue horizontal line is located directly beneath the text "Part II".

Yongwhan Lim
Senior Quantitative Software Engineer at Two Sigma
8pm KST, Wednesday, July 13, 2022

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Yongwhan Lim



- Currently:
 - Senior Quantitative Software Engineer at Two Sigma
 - Lecturer in EECS at MIT
 - Research Mentor in SIMR at Harvard University
 - Associate in Computer Science at Columbia University
 - ICPC Head Coach at Columbia University
 - ICPC Judge for Greater New York Mid-Central Regionals in N.A.
- Previously:
 - Research Software Engineer at Google Research
- Education:
 - Stanford: Math & CS (BS '11) and CS (MS '13)
 - MIT: Operations Research (PhD, started in 2013 but on an extended leave-of-absence since 2016)



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Overview

- Part I
 - Behavioral interview (must for any SWE)
 - System design interview (> entry level)
 - Machine learning interview (ML engineer)
- Part II: Questions & Answers (Q & A)



Part I



Part I-A

Behavioral

Behavioral Interview (for everyone)

- At least one session in typical non-entry level Software Engineer (SWE) interview loop.
- Wants to learn leadership potential.
- Tests soft skills (e.g., effective communication, conflict resolution, etc.)
- Open-ended: not about right or wrong!

Example Question #1

- Tell me about a time when you led a team to successfully complete a project.

Example Question #1: Sample Answer

- Best if you led a hackathon/passion project.
- Otherwise, if you led a project as an intern, highlight it.
- Be **concise**
- Include hard **metrics** (in terms of %, \$, etc).
- Provide **concrete** example.

Example Question #2

- How do you set up priorities for the work you are facing each day?

Example Question #2: Sample Answer

- Priority queue idea:
 - Most essential responsibilities first!
 - Respond to emergencies as needed.
 - Non-essential tasks can be delayed.

Resources

- There are number of preparation books.
- For example:
 - Behavioral Interview Questions and Answers by Horatio Bird.
 - Leadership Interview Questions You'll Most Likely Be Asked by Vibrant Publishers



Part I-B

System Design

System Design Interview (for > entry level)

- Identify large components of the system and describe how each component is connected.
- Actual implementation details are not as important.
- Tests whether you can design an architecture using standard design patterns.

Example Question #1

- Design YouTube

Example Question #2

- Design Instagram

Resources

- Must reads are:
 - *The System Design Interview*, 2nd Edition by Lewis C. Lin, et. al.
 - *System Design Interview* by Alex Xu

Resources

- Must reads are:
 - *The System Design Interview*, 2nd Edition by Lewis C. Lin, et. al.
 - *System Design Interview* by Alex Xu
- If you have time to dig deeper, consider:
 - *Understanding Distributed Systems* by Roberto Vitillo
 - *Designing Data-Intensive Applications* by Martin Kleppmann

Part I-C

Machine Learning

Machine Learning Interview (for ML SWE)

- **Hands-on experience** using TensorFlow/Keras/PyTorch: comfortable using data to feed into a baseline model.
- ML foundations (e.g., linear regression, support vector machine, etc.)
- Recent trends (reinforcement/deep learning)

Machine Learning Interview (for ML SWE)

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- ML foundations (e.g., linear regression, support vector machine, etc.)
- Recent trends (reinforcement/deep learning)

- In-depth knowledge of a specialization can be a plus, but not required (e.g., computer vision, natural language processing, etc.).

Example Question (Theory)

- What is a difference between unsupervised learning vs supervised learning?

Example Question (Hands-on)

- **How do you avoid overfitting? implementation: given stock trends, predict the future stock price.**

Example Question (Implementation)

- Given stock trends, predict the future stock price.

(Must!) Resources

Textbooks

- Deep Learning, Ian Goodfellow and Yoshua Bengio and Aaron Courville

Courses

- CS 229: Machine Learning, Stanford, Andrew Ng

Tools

- PyTorch, Keras, TensorFlow



Part II: Q&A's

Q & A's

- What are some tips to be successful in the interview process at Google?

Q & A's

- What are some good questions to ask after the interview?

Q & A's

- How should I communicate with interviewer during interview?

Q & A's

- What are the good and bad examples of a technical interview?

Q & A's

- Is LeetCode enough for preparing the technical interview?

Q & A's

- What do you do if you do not know how to solve the problem?

Q & A's

- What technologies do you use at Google?

Q & A's

- (COVID) How is virtual tech interview different from the in-person interview?

Mock Interview Opportunity!

- If you attended both Part I and Part II of this special workshop, you are invited to do a mock interview with me should you like to.
- The link to the request form is <https://forms.gle/8gCg3Te8GCsMYgHWA>.

Contact Information

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