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Technical Interview Workshop Day II @ CMU SV

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Yongwhan Lim

Senior Quantitative Software Engineer at Two Sigma



- Currently:
 - Senior Quantitative Software Engineer at Two Sigma
 - Lecturer in EECS at MIT
 - Associate in Computer Science at Columbia University
 - Visiting Instructor at Cornell-Tech
 - ICPC Head Coach at Columbia University
 - ICPC Judge for Greater New York and Mid-Central Regionals in North America
 - ICPC Judge for North America Qualifier
- Previously:
 - Research Software Engineer at Google Research
- Education:
 - Stanford
 - Math (BS '11) and CS (BS '11)
 - 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 and Answers (Q&A's)

Part I

Part I-A

Behavioral

Behavioral Interview (for everyone)

- Becoming an industry standard to have **at least one** session in typical Software Engineer (SWE) interview loop.
- Wants to assess leadership potential.
- Tests soft skills (e.g., effective communication, conflict resolution, etc.)
- Open-ended: **not** about getting it 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** examples.



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.



Example Question #3

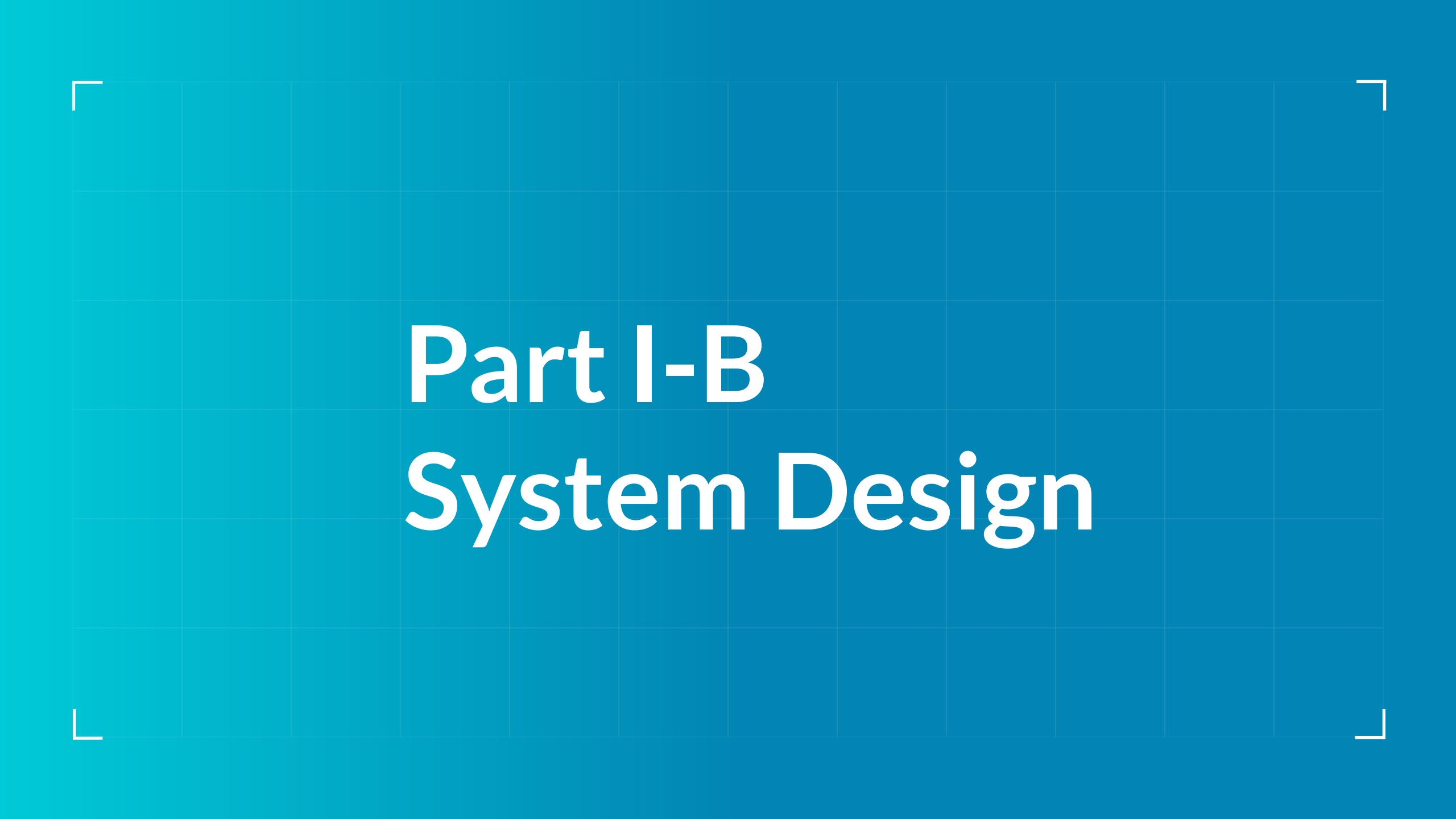
- What experiences do you have relevant to this job?

Example Question #3: Sample Answer

- Highlight a technical project you have done that lasted **at least** one year.
- Discussing technologies is a **must**! (programming languages, databases, algorithmics, development tools, etc.)

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 learning, deep learning architectures, etc.)

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 learning, deep learning architectures, etc.)
- **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 and supervised learning?

Example Question (Hands-on)

- How do you avoid overfitting?

Example Question (Implementation)

- Given stock market data, predict the future stock price.

(Must!) Resources

- **Textbooks**
 - *Deep Learning* by Ian Goodfellow, et. al.
- **Courses**
 - CS 229 (Stanford): Machine Learning
- **Tools**
 - PyTorch
 - Keras
 - TensorFlow
 - Jupyter

Part II

Q & A's



Q & A's

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



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 or preparing the technical interview?



Q & A's

- What do you do if you do not know how to solve or answer a problem?



Q & A's

- What are some typical technologies you must know to succeed in a technical interview?



Q & A's

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

Mock Interview Opportunity!

- If you attended both Day I and Day II of this special workshop series, you are invited to do a mock interview with me should you like to.
- The link to the request form is available here: calendly.com/yongwhan/one-on-one/

Contact Information

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