McGill
Technical Interview Workshop
Part II

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Yongwhan Lim

Education

Stanford University

MIT

Part-time Jobs

Cornell Tech

MIT EECS

Full-time Job

Google Research

TWO SIGMA

Workshops

Stanford ENGINEERING | Stanford Computer Forum

Carnegie Mellon University

Harvard

University of California

KAIST

NUS National University of Singapore

Coach/Judge

icpc International Collegiate Programming Contest

icpc.foundation

advancing the art and sport of competitive programming

https://www.yongwhan.io

Yongwhan Lim

- Currently:
  - **CEO** (Co-Founder) in a Stealth Mode Startup;
  - **Co-Founder** in Christian and Grace Consulting;
  - ICPC **Internship Manager**;
  - ICPC **North America Leadership** Team;
  - Columbia ICPC **Head Coach**;
  - ICPC **Judge** for NAQ and Regionals;
  - **Adjunct** at Columbia CS;
  - **Visiting Instructor** at Cornell-Tech;

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Overview

- **Part I: Behavioral Interview (must for any SWE)**
- **Part II: System Design Interview (> entry level)**
- **Part III: Machine Learning Interview (ML Engineer/Data Scientist)**

Part I: Behavioral

Behavioral Interview (for everyone)

- Becoming an industry standard to have at least one session in typical software engineering 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**: C++ vs Java vs Python vs Go vs ?
  - **Databases**: SQL vs NoSQL vs ?
  - **Algorithms and Data Structures**
  - **Development tools**: Emacs vs Vim vs Visual Studio vs JetBrain vs ?

Resources

- There are number of preparation books.

- For example:
  - *Behavioral Interview Questions and Answers* by Horatio Bird;
  - *Leadership Interview Questions You'll Likely Be Asked* by Vibrant Publishers;

Part II: 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.

Resources

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

Part III: Machine Learning

Machine Learning Interview

- **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

- **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 (e.g., computer vision) can be a plus, but not required.

Example Question (Theory)

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  - **label**!

Example Question (Hands-on)

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  - early stopping
  - regularization
  - data augmentation
  - dropout

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  - quant approach: **mean reversion** and/or **momentum**

Example Question (Implementation)

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  - machine learning approach: **regression**
  - time series approach: **anomaly detection**
  - quant approach: **mean reversion** and/or **momentum**
  - any of the above is ok, so just ask away!

(Must!) Resources

- **Textbooks**: *Deep Learning* by Ian Goodfellow, et. al.

- **Courses**: Stanford CS 229 (Machine Learning); ...

- **Tools**: PyTorch; Keras; TensorFlow; Jupyter; ...

Contact Information

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- **LinkedIn Profile**: https://www.linkedin.com/in/yongwhan/
  - Feel free to send me a connection request!
  - Always happy to make connections with promising students!