Hai Wang

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Summary

Seasoned Tech Lead and Software Engineer with 10+ years experience in architecting and implementing highly scalable, available and performing systems with data-driven approaches. Equipped with strong product sense and technical toolset to enable new use cases for billions of users. Proficient knowledge in finance and investment (ex CFA charterholder). Versed in people management.

Experience

Facebook, Video Infra Processing Team / Tech Lead
FEB 2019 - PRESENT, MENLO PARK, CA

- Spearheaded building out the nextgen video processing engine - a lambda-like serverless framework that orchestrates the processing flow for all the videos uploaded from Facebook, Instagram and Messenger.
  - Implemented the version control system for the self-service workflow/lambda functions.
  - Framework features include named outputs, memoization, DAG of operations, mapreduce and jailed execution.
- Built a video codec evaluation framework that runs traditional ad-hoc and monolithic evaluation scripts on the processing engine, which resulted in 7x speed up (15+hrs -> 2hrs) for one per-shot dynamic optimizer run.
  - Proved the idea and got buy-in from stakeholders by building a prototype that achieved the time reduction.
  - Now the framework supports 4 codec researchers. Workflow includes per-title/per-shot dynamic optimizer encoding for premium content, VP9/AV1 encoding, ASIC hardware encoding.
- Led the New Year Eve preparation for video processing stack. It was a large collaboration effort with 12 teams. The work includes traffic estimation, capacity request, load test and incident handling.
  - Peak time the system took 3 mil unique user video ingestions per minute.
- Mentored and coached two underperforming teammates. Ran weekly team scrum and planning meeting for the workflow engine team.

Instagram, Live Product Infra Team / Tech Lead
SEP 2015 - FEB 2019, MENLO PARK & SAN FRANCISCO, CA

- Led 8-person live infra team and shipped Instagram VideoChat, featuring 2-4P group video chat. Led backend architecture design and implementation. Defined reliability and quality metric and drove the logging implementation. Served as infra POC for XFN communication. Product features include video or audio only mode, picture-in-picture mode, Apple PushKit and Callkit.
- Built Instagram "Live with a friend" feature (2P co-broadcasting) from scratch, including prototyping, designing integration solution across three different stacks, implementation, experimentation, instrumentation,

monitoring, staged rollout, capacity planning, issue troubleshooting and XFN communication. This feature had boosted broadcast duration by 2x with 20% production increase.
- Led the product backend team to build Instagram Live product from ground-up. Designed, prototyped and shipped Live comments feature, concurrent viewer count feature, Live VOD feature, metric definition, load testing, built data pipeline and coordinated global launch.
- Drove the CDN cache priming project for Instagram Live with the traffic team and improved client DASH playback performance and increased edge cache hit ratio by 2x.
- Mentored 2 interns and 4 junior engineers. Onboarded TPMs and Data scientists.

J.P. Morgan Chase & Co., Rates eTrading Team / Senior Developer
FEB 2010 - AUG 2015, NEW YORK, NY

- Developed a smart order routing service for inter-dealer market that achieves low latency multi-market depths aggregation and dynamic order rebalancing in reaction to market change; a matrix-indexing data structure for aggregation is introduced to build orderbook and proved to be 50% more time-efficient
- Built a WPF-based vertical stack view for central order book with click to trade feature, which saved 90% of the time needed to enter an order; it also includes a feature to predict user's order position in queue. This increased transparency thus avoided vast amount of opportunity cost and reduced user cancelling soon-to-be-filled orders

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Education

Columbia University / MS
SEP 2008 - DEC 2009, NEW YORK, NY

Electrical Engineering

Nanjing University of Aeronautics and Astronautics / BEng
SEP 2004 - JUL 2008, NANJING, CHINA

Top 1%. Electrical Engineering and Control System BA; Minor in Business

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Other

Invited keynote talk: "Instagram Live Architecture", Tencent Live Developer Conf 2018 & Xiaohongshu (RED).

Passed all three levels of Chartered Financial Analyst exam.