Hans B. DeJong

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I am an aspiring software engineer with a PhD in oceanography from Stanford where I analyzed terabytes of data and designed and built novel oceanographic instruments. I have also taught secondary science for six years and developed excellent communication, mentoring, and leadership skills. I recently attained a master's in the MCIT program from the University of Pennsylvania where I gained valuable experience and technical skills in distributed systems, databases, computer networks, web applications, cybersecurity, big data analytics, and artificial intelligence. I am seeking to combine my scientific and teaching expertise with my deepening understanding of technology to join a software development team.

Education

University of Pennsylvania Dec 2022
Master of Computer and Information Technology (MCIT), Grade: 4.0

- Received A+ grades in most courses.
- Completed additional graduate level computer science courses at Stanford.
- Selected to beta test and review a new course, *Cloud Computing Technologies*.

Stanford University Jan 2018
PhD Environmental Earth System Science, Grade: 3.96

Brown University May 2008
B.A Geology-Biology, Grade: 3.94

Skills

Programming Languages
Java, Python, JavaScript, C, C++, Go, Arduino

Databases
SQL, MongoDB, Neo4j

Web Technologies
React, HTML, CSS, Node.js, Express, D3.js, REST API, AJAX, Bootstrap, Material UI

Data Science
Apache Spark, Pandas, NumPy, Matplotlib, Scikit-learn, Apache MXNet

Cloud
AWS (RDS, EC2, EMR), GCP (Firebase)

Tools
Git, Vim, Linux, JUnit, Docker, GNU Debugger

Projects

Network Simulator Jan 2023 - present

- Extended an open-source discrete-event network simulator that is used by networking researchers.
- In a team of three, extended the node codebase to support two distributed routing protocols, link-state and distant-vector routing; implementation handles situations when links break or new nodes are added.
- Developed a Distributed Hash Table (Chord) as an overlay network layered on top of our routing protocol.
- Built a distributed search engine application that uses Chord.

Quaero Search Engine Nov-Dec 2022

- Built and deployed a distributed Google-style cloud-based search engine that interacts with users via a frontend and returns relevant search results for user queries.
- Implemented a web server (Spark Java clone), key-value store, distributed analytics engine (Apache Spark clone), web crawler, and indexer from scratch in Java.
- In a team of four, deployed our components on multiple AWS EC2 instances to crawl and index hundreds of thousands of web pages and built a ranker using page rank and term frequency inverse document frequency.
- Added bonus features including phrase match, infinite scrolling, page previews, and weather search.

FIFA World Cup App Feb-Apr 2022

- Developed a web application where users can query and view detailed statistics from all FIFA World Cup matches including player lineups, substitutions, goal scorers, and yellow/red cards.
- Cleaned and merged datasets from multiple sources and then designed and created a SQL database that was deployed on AWS RDS.
- Designed and built the frontend using React and Material UI and queried the database using a REST API.
- Added bonus features including player, team, and stadium statistics. Users can also gain insights such as top scorers and timing of goals for a specified team and/or tournament.

Photo Sharing App Mar 2022

- Created a photo sharing application that supports all basic functionalities including the ability for users to log in and out, register, upload photos, comment on photos, like photos, and create a list of favorite photos.
- Built the frontend with React following the model-view-controller decomposition, implemented capabilities to fetch data from a server with AJAX, and set up the database with MongoDB.

Professional Experience

Software Engineer Jun-Aug 2022

Stanford University

- Built new learning management system for Code in Place, a free online Python course hosted by the Stanford computer science department.
- Created the login page and admin system using React and Firebase to manage 1,000 teachers and 10,000 students worldwide.
- Designed and implemented a new user experience for the learning center, where instructors can add and edit course content such as videos and readings using a rich text editor.

Science and Computer Science Teacher 2018-2020

American International School Chennai, India

- Championed computer science education by designing a new course for freshman and sophomores that teaches students the fundamentals of computer programming in Java.
- Collaborated with a Stanford computer science professor and based my course on the first half of Stanford's CS 106A, *Programming Methodologies*, one of the most popular courses at Stanford.
- Established an inclusive culture with peer tutoring at the core of all lessons.
- Led all students to successfully build the game Breakout and complete a creative final project.

Postdoctoral Research Scientist 2018

Stanford University

- Proposed building custom autonomous instruments for a new research project to study the impact of climate change on coral reefs in the Indian Ocean.
- Secured a seed grant and then designed, built, and tested automatic water samplers and pumping systems.
- Deployed instruments on coral reefs to monitor coral reef health and calculate net growth rates.
- Resulted in significant cost savings (commercial samplers cost $35,000 each, ours cost $3000 to build) and provides the ability to scale ongoing coral reef biogeochemistry studies.

Doctoral Candidate 2012-2018

Stanford University

- Secured funding with a prestigious National Science Foundation Graduate Research Fellowship to study the impacts of climate change on the Southern Ocean, Antarctica.
- Initiated, designed, implemented, and managed all phases of complex collaborative projects to completion.
- Processed terabytes of raw satellite data to create high resolution composite images of the Antarctic shelf and developed algorithms to identify frazil ice algal bloom hotspots.
- Build computer models to calculate instantaneous air-sea CO_2 flux rates with high resolution underway datasets from 20 cruises.
- Published seven studies in top peer-reviewed journals, presented findings at major conferences, and volunteered as an expert reviewer for the journals *Nature Geosciences* and *Geophysical Research Letters*.