Hans B DeJong

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EDUCATION

University of Pennsylvania, *Master in Computer Science, MCIT (4.0 GPA)* Dec 2022

- Coursework: Distributed Systems, Databases, Big Data, Artificial Intelligence, Networked Systems, Algorithms
- Completed additional graduate level CS courses at Stanford: Web Applications, Computer and Network Security
- Selected to beta test and review a new course, Cloud Computing Technologies.

Stanford University, *PhD Earth System Science (3.96 GPA)* Jan 2018

Brown University, *B.A Geology-Biology (3.94 GPA)* May 2008

SOFTWARE ENGINEERING EXPERIENCE

Software Engineer, *Stanford University Computer Science Department* Jun-Aug 2022

- Developed a new Learning Management System for Code in Place, a free online Python course.
- Created an admin system to manage 1,000 teachers and 10,000 students.
- Designed and built a new user experience for the Learning Center by consulting with instructors and online students.
- Leveraged knowledge in Full Stack Web Development, React, JavaScript, HTML, CSS, Firebase, User Experience

PROJECTS

Network Simulator Extension Jan 2023 - present

- Collaborated with a team of three to extend an open-source discrete-event network simulator to support distributed routing protocols (link-state and distant-vector) that are capable of handling network topology changes.
- Developed a Distributed Hash Table (DHT) as an overlay network on top of our routing protocols and created a distributed search engine application that uses our DHT.
- Skills: C++, Network Protocols, Serialization, Event Driven Programming, Navigating large codebases

Quaero Search Engine Nov-Dec 2022

- Collaborated with a team of four to develop and deploy a distributed Google-style search engine from scratch.
- Built key components of search engine in core Java, including web server, key-value store, distributed analytics engine, web crawler, and indexer. Deployed these components across multiple AWS EC2 instances.
- Crawled and indexed over 200,000 web pages and developed a ranker that utilizes PageRank and TF-IDF to produce high quality search results for user queries. Optimized search engine to achieve sub-second end-to-end response times.
- Added bonus features such as phrase match, infinite scrolling, page previews, and weather search.
- Skills: Java, Distributed Systems, Key-Value Store, Analytics Engine, Web Crawler, Multithreading, AWS

FIFA World Cup App Feb-Apr 2022

- Developed a comprehensive FIFA World Cup application to provide soccer fans with a centralized platform to access detailed match statistics and insights from World Cup tournaments.
- Combined and cleaned match data from multiple sources for all World Cup matches between 1930 to 2014.
- Designed, built, and deployed a normalized SQL database on AWS RDS.
- Optimized queries to reduce latencies from 1120 ms to 680 ms (40% reduction), resulting in a seamless user experience.
- Skills: Database Design, Query Optimization, SQL, Pandas, React, RESTful API, Material UI, JavaScript, Node.js, AWS

Photo Sharing App Mar 2022

- Developed a full-stack Facebook-style photo sharing application with user authentication, image upload, comments, likes, and favorite photo lists.
- Skills: HTML, CSS, JavaScript, React, Express, Node.js, Responsive Design, Material UI, RESTful API, Model View Controller, Sessions and Cookies, Authentication, CRUD, MongoDB

TECHNICAL SKILLS

Programming Languages: Java, Python, JavaScript, C++, C, Go, Arduino
Web Technologies: React, HTML, CSS, Node.js, Express, D3.js, REST API, Bootstrap, Material UI, Responsive Design
Databases and Cloud: SQL, MongoDB, Neo4j, AWS (EC2, RDS, EMR), GCP
Data Science: Apache Spark, Pandas, NumPy, Matplotlib, Scikit-learn, Apache MXNet
Tools: Git, Vim, Linux, JUnit, Docker, GNU Debugger

TEACHING AND RESEARCH EXPERIENCE

Science and Computer Science Teacher, *American International School Chennai, India* 2018-2020

- Created and designed a new computer science course for freshman and sophomore students based on Stanford's popular course CS 106A, Programming Methodologies.
- Collaborated with a Stanford professor to provide extra scaffolding and challenge problems, resulting in increased students' understanding of fundamental concepts.
- Fostered an inclusive classroom environment, integrating peer tutoring and group projects to enhance collaboration and teamwork skills.
- Led all students to build the game *Breakout*, demonstrating mastery of programming concepts, and supervised creative final projects where students designed and developed their own applications.

Postdoctoral Research Scientist, *Stanford University* 2018

- Conceptualized and led an innovative project to monitor coral reef health by building custom autonomous instruments.
- Secured a seed grant and then designed, built, and programmed automatic water samplers and pumping systems.
- Conducted extensive testing and calibration of the instruments, including deployment on coral reefs in the Indian Ocean, and published the designs in the journal *HardwareX*.
- Resulted in significant cost savings (commercial samplers cost $35,000, ours cost $3,000) that enabled the expansion of ongoing coral reef biogeochemistry studies.

Doctoral Candidate, *Stanford University* 2012-2018

- Received 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 complex collaborative projects to completion, resulting in oral presentations at major conferences and five studies published in top peer-reviewed journals.
- Processed terabytes of raw satellite data to create high-resolution composite images of the Antarctic shelf and developed innovative algorithms to identify frazil ice algal bloom hotspots.
- Built computer models to calculate instantaneous air-sea CO_2 flux rates using high-resolution underway datasets from 20 cruises, providing new insights into the global carbon cycle.
- Volunteered as an expert reviewer for the prestigious journals *Nature Geosciences* and *Geophysical Research Letters*.