

Dan (Shi Jie) Tan

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EDUCATION

University of Waterloo (Waterloo, CA)

September 2015 – August 2020

Civil Engineering, Honours BAsC

- **Relevant Courses:** Algorithms & Data Structures, Optimization, Probability & Statistics, Computational Methods
 - Systems Programming & Concurrency: Implemented asynchronous network and multi-threaded programs (synchronization patterns, deadlock recovery, file systems, web crawling) using C in Linux environment
 - Databases & Software Design: Designed and built 3-tier web applications using Ruby on Rails; Gained exposure with agile methodologies, CI/CD, TDD & unit testing (RSpec), design patterns (SOLID) & antipatterns; Adopted Git for version control; Designed relational databases and wrote queries using SQL
 - Pattern Recognition: Applied clustering, classifications, parametric & nonparametric learnings, and discriminant functions through MATLAB
 - Artificial Intelligence: Utilized Python & libraries (NumPy, Pandas, Scikit-learn, TensorFlow) to create AI models based on techniques such as alpha-beta pruning, model checking, Bayesian network, Markov chain, HMM, simulated annealing, backtracking search, ensemble methods, SVM, Q-learning, CNN & RNN

University of Leeds (Leeds, UK)

January – June 2019

- **Computational Fluid Dynamics Project:** Investigated the effects of fluid flow and heat transfer in microchannels through the finite volume method (MATLAB & Ansys Fluent)

SAMPLE PROJECTS

- **Dungeons & Dragons (D&D):** final project for my software design course that allows a user to CRUD spells & spell books (Ruby on Rails)
- **Traffic:** a CNN model that I built to predict German traffic signs (Python & TensorFlow)
- **Fifth Grader:** a math game that allows a user to select a level and math operation to play (React)
- **Matrix Stiffness:** a demo of the popular structural analysis method for solving and plotting indeterminate structural members (MATLAB)

EXPERIENCE

Research Assistant – Hydrologic Model Development & Analysis

Water Institute, Waterloo

April – August 2018

- Co-developed the subroutines of the hydrologic model – MESH in structured programming by reading Fortran documentation and research papers
- Performed automated testing & model calibration with batch files and debugged compile- & run-time errors
- Conducted statistical and time series analysis of hydrologic data by manipulating data and utilizing regression, ARIMA, and dynamic time warping techniques through R and its libraries
- Presented research summary of the interflow and infiltration algorithms at the 2018 Canadian Geophysical Union Conference (CGU) in Niagara Falls

Technical Intern

Simpson Gumpertz & Heger, San Francisco

September – December 2019

- Developed and presented visual contents including decision trees and flowcharts based on engineering documentation and specifications
- Identified building enclosure design issues and revised based on building physics principles including heat flow, air ventilation, and water infiltration
- Displayed effective written/verbal communication and organizational abilities by assisting with 20+ technical reports and verifying submittals based on shop drawings and datasheets

Project Coordinator

EllisDon – Ottawa Light Rail Transit Project, Ottawa

September – December 2017

- Performed scheduling through Gantt charts & the critical path method and met changing deadlines & priorities
- Conducted quantity take-offs (estimating) and verified product contracts for cost control, successfully reducing the project closure phase
- Utilized Oracle's Primavera software for tracking project progress and responding to inquiries

Structural Modelling Intern

HongRun Group Co. Ltd, Shanghai

January – April 2017

- Demonstrated quantitative abilities by calculating load combinations for model input and evaluating the model output with respect to the building code
- Drafted structural details per specifications through AutoCAD

ACHIEVEMENTS & LEADERSHIP -----

- **Hult Prize Waterloo Finalist – Craft Collective:** Selected as one of the top 8 finalist teams to pitch youth unemployment solutions out of 20+ teams
 - **Reference:** <https://uwaterloo.ca/conrad-school-entrepreneurship-business/news/student-entrepreneurs-pitch-solutions-youth-unemployment>
- **Podcast Team @ Engineers Without Borders UW Chapter:** Co-produced sustainability-themed podcasts from a systems-thinking perspective, aiming to increase awareness on campus
 - **Reference:** <https://anchor.fm/uwaterlooewb/>
- **UW Tennis Varsity Athlete:** Selected as one of the 9 roster players out of 50+ players in the varsity tryout
 - **Reference:** <https://athletics.uwaterloo.ca/sports/mens-tennis/roster/2018-19>
- **Teaching & Tutoring:**
 - Certified Tennis Canada Instructor
 - Stepping Stones China English Teacher: Taught 15+ migrant children in China
 - Daedalus Academy Camp Assistant: Tutored elementary-school children LEGO robotics
- **Campus Sustainability Initiative:** Campus Compost Operator
- **Recipient of the UW President's Scholarship**

TECHNICAL SKILLS -----

- **Languages:** C++, C, Python, R, MATLAB, SQL, HTML, CSS, JavaScript, Ruby
- **Frameworks and Libraries:** Rails, React, NumPy, Pandas, TensorFlow
- **Tools:** Git, Docker, Valgrind, RSpec