Dan (Shi Jie) Tan

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EDUCATION

University of Waterloo (Waterloo, CA) **2015 – 2020**

Civil Engineering, Honours BASc

- **Computer Science Courses:** Algorithms & Data Structures, Optimization, Statistics, Numerical Methods
  - Pattern Recognition & AI: Applied clustering, classifications, parametric & nonparametric learnings, and discriminant functions through MATLAB; Utilized Python & libraries 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
  - Databases & Software Design: Designed and built 3-tier web applications using Ruby on Rails; Gained exposure with agile methodologies & design patterns such as SOLID; Adopted TDD & unit testing through RSpec and Git for version control; Designed relational databases and wrote queries using SQL
  - Systems Programming & Concurrency: Implemented synchronization patterns and asynchronous & event-driven I/O using C

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

SAMPLE PROJECTS

- **Dungeons & Dragons (D&D):** final project for my software design course that allows a user to CRUD spells & spellbooks (Ruby on Rails)
- **Traffic:** a CNN model that I built to predict German traffic signs (Python & TensorFlow)
- **Fifth Grader:** a math game where a user can choose a math operation and level (React)
- **Matrix Stiffness:** a demo of the popular structural analysis method for solving 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
- Tested the program subroutines with shell scripts and debugged compile- & run-time errors
- Conducted statistical and time series analysis of hydrologic data by manipulating data and utilizing regression and dynamic time warping techniques through R's libraries; Gained exposure with ARIMA
- 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 and the critical path method for minimizing project delays
- 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 Varsity Athlete - Tennis**: 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: teaching 15+ migrant children in China
  - Daedalos Academy Camp Assistant: tutoring 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, TensorFlow
- **Tools:** Git, Docker, Valgrind, RSpec