# Dan Tan

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## EDUCATION

**University of Waterloo (CA) & University of Leeds (UK)** **Sep 2015 – Oct 2020**

*Civil Engineering, Honours BASc (w/ graduate-level coursework)*

- **Relevant Courses:** Algorithms & Data Structures, Optimization, Pattern Recognition, Artificial Intelligence, Numerical Computation, Systems Programming & Concurrency, Databases & Software Design

## PROJECTS

- **Dungeons & Dragons:** Developed a full-stack D&D app that helps users manage spellbooks (**Ruby on Rails, SQL**)
  - **URL:** https://dd-spellbooks.herokuapp.com
- **Crossword:** Wrote an AI that generates and solves crossword games through backtracking & heuristics (**Python**)
- **Heredity:** Implemented a Bayesian network model to assess the likelihood of a genetic trait in a family (**Python**)
- **Poetry:** Created a LSTM model that generates poetry text (**TensorFlow**)
- **Fifth Grader:** Designed a math game UI with various operations and difficulty levels (**React**)
- **Web Crawler:** Implemented asynchronous I/O with cURL for web crawling PNG files (**C, Valgrind**)
- **CFD:** Investigated the effects of fluid flow and heat transfer in microchannels through FVM (**MATLAB, Ansys)**

## EXPERIENCE

**Research Assistant – Hydrologic Model Development & Analysis**
**Water Institute, Waterloo** **Apr – Aug 2018**

- Debugged hydrologic software by understanding the existing codebase and comparing with previous code versions
- Performed model calibration using various geographical soil data and the NSE metric for optimizing prediction
- Conducted statistical and time series analysis of hydrologic data by utilizing regression, ARIMA, and dynamic time warping techniques through R
- **URL:** github.com/dantan123/pattern_recognition/blob/master/dynamic_time_warping/DTW%20Review.pdf/
- Presented research summary of the numerical interflow and infiltration algorithms at the 2018 Canadian Geophysical Union Conference (CGU)
- Reviewed research papers of nonstationary intensity-duration-frequency curves using generalized extreme value distributions and Bayesian Markov chain Monte Carlo for flood forecasting

**Technical Intern**
**Simpson Gumpertz & Heger, San Francisco** **Sept – Dec 2019**

- Developed and presented algorithmic flowcharts and decision trees based on engineering documentation and specifications, thus helping to pinpoint minimal standard requirements to clients
- Identified and investigated critical engineering (building enclosure) design issues and revised architectural drawings based on underlying scientific principles, improving enclosure performance and durability
- Drafted 10+ technical reports and verified product submittals based on shop drawings and datasheets, in collaboration with senior project consultants and managers

**UW EWB Podcast – Ideas Without Borders** **May – Aug 2018**

- Advocated systems-thinking to engineers and university students through podcasts
- **Topics:** Feedback loops, big data, biases & heuristics, sustainable transportation, and healthy food options
- **URL:** anchor.fm/uwaterlooewb/

**Hult Prize Waterloo Finalist – Craft Collective (For Us, By Us)** **Sept – Dec 2018**

- Conducted in-depth research, survey, and analysis of rural unemployed female youth in developing countries
- Selected as one of the top 8 finalist teams to pitch youth unemployment solutions out of 20+ teams
- **URL:** waterloo.ca/conrad-school-entrepreneurship-business/news/student-entrepreneurs-pitch-solutions-youth-unemployment

**Project Coordinator**
**EllisDon – Ottawa Light Rail Transit Project, Ottawa** **Sept – Dec 2017**

- Documented meeting minutes and detailed daily progress by interfacing with subcontractors, QA personnel, consultants, and engineers in a 200+ people team
- Tracked project progress and updated weekly schedules to meet changing deadlines and priorities
- Verified material quantities (estimating) and invoices as well as creating lists of necessary submittal items for cost control, successfully reducing the project closure phase

**Structural Modelling Intern**
**HongRun Construction Group, Shanghai** **Feb – Apr 2017**

- Built structural models and evaluated the model output with respect to the building code
- Drafted structural dimensions and details through AutoCAD

**Tennis Canada Instructor** **Jun – Aug 2018**

- Implemented Tennis Canada's "Learn to Play" curriculum for teaching starter players serve, rally, and score
- Effectively lead students by presenting clear visual demonstrations and concise explanations as well as providing positive feedback for tactical and technical improvements
- Set up and organized games and practices while maintaining a safe and fun environment

**UW Varsity Tennis** **Sept – Dec 2018**

- Selected as one of the top 9 roster players and successfully managed to balance academic workload while committing to 10 hrs of training per week
- **URL:** athletics.uwaterloo.ca/sports/mens-tennis/roster/2018-19

**Emmaus Leeds** **Mar 2019**

- Fundraised for the Leeds charity branch through jailbreak hitchhike to Cologne, Germany
- **URL:** emmaus.org.uk/leeds/students-complete-jailbreak-hitch-for-emmaus-leeds/

## TECHNICAL SKILLS ----------

- **Languages:** C++, C, Python, R, MATLAB, SQL, HTML, CSS, JavaScript, Ruby
- **Frameworks and Libraries:** Rails, React, Bootstrap, Pandas, Scikit-learn, TensorFlow
- **Tools:** Git, Valgrind & Helgrind, RSpec, unittest