

# Dani Chu

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## EDUCATION

### SIMON FRASER UNIVERSITY, BURNABY, BC

09/2018 – 04/2020 (Expected)

Masters of Science in Statistics

Supervisor: Dr. Tim Swartz

Honours & Awards:

NSCERC Alexander Graham Bell Canada Graduate Scholarship (\$17,500 CDN)

09/2018 – 08/2019

### SIMON FRASER UNIVERSITY, BURNABY, BC

09/2013 – 04/2018

Bachelor of Science (with Distinction)

CGPA: 3.69/4.33

Joint Major in Mathematics and Computing Science, Major in Statistics

Semester Abroad – San Diego State University

CGPA: 3.93/4.00

Honours & Awards:

Department of Statistics and Actuarial Science Endowment Award (\$1,200 CDN)

Spring 2018

Department of Mathematics Award (\$1,000 CDN)

Spring 2018

President's Honour Roll

Fall 2016, Spring 2018

Dean's Honour Roll

Spring: 2015, 2017, 2018, Fall: 2016, 2017

Statistics Undergraduate Chair Travel Grant (\$1,000 CDN)

Fall 2017

NSERC Undergraduate Student Research Award (\$6,356 CDN)

Summer 2017

International Mobility Award (\$1,000 CDN)

Spring 2016

SDSU Dean's List

Spring 2016

SDSU On Campus Housing Scholarship (\$5,000 USD)

Spring 2016

## REFEREED PUBLICATIONS

Tingling, P., Masri, K. and **Chu, D.** (Under Review). Catch and Release? Endowment Effects in the NHL Expansion Draft. *Sport, Business, Management: an International Journal*.

**Chu, D.**, Wu, Y. and Swartz, T.B. (2018, March). Modified Kelly Criteria. *The Journal of Quantitative Analysis in Sports*, 14(1), pp. 1-11.

## CONTRIBUTED PRESENTATIONS

**Chu, D.**, Sheehan, R., Tsai, M.-C., and Davis, J. *Pacing Profiles in World Championship 2000m Rowing Explored Through k-Shape Clustering* (2018, October). Poster accepted for presentation at the Carnegie Mellon Sports Analytics Conference. Pittsburgh, Pennsylvania.

**Chu, D.**, Wu, Y., Reyers, M., and Doyle, C. *Personalize Foul Trouble, Improving Foul Management in the NBA* (2018, August). Poster presented at the Cascadia Symposium on Statistics in Sports. Vancouver, British Columbia.

**Chu, D.**, Sheehan, R., Tsai, M.-C., and Davis, J. *Pacing Profiles in World Championship 2000m Rowing Explored Through k-Means Clustering* (2018, August). Poster presented at the Cascadia Symposium on Statistics in Sports. Vancouver, British Columbia.

**Chu, D.**, Wu, Y. and Swartz, T.B. *Modified Kelly Criteria* (2018, July). Speed presentation and posted presented at the 2018 Statistics in Sport Undergraduate Research Competition at the Joint Statistical Meetings. Vancouver, British Columbia.

Tingling, P., Masri, K. and **Chu, D.** (2018, May). *Catch and Release? Endowment Effects in the NHL Expansion Draft*. Presentation selected for the Administrative Sciences Association of Canada, Sport & Tourism Management Division. Toronto, Ontario.

**Chu, D.**, Reyers, M., Wu, Y., Bailey, S. and Bystrom, K. (2018, March). *Structure vs Speed: Evaluating the Power Play Neutral Zone Regroup Decision in the AHL*. Presented at the Vancouver Hockey Analytics Conference. Vancouver, British Columbia.

Wu, Y., **Chu, D.**, He, S. and Paton, F. (2017, July). *Applications of Modern Computational Methods and Statistical Learning Theory for Data Driven Decisions*. Presented at Fraser Health Population and Public Health Lunch & Learn. Surrey, British Columbia.

## TECHNICAL SKILLS

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**Proficient:** R, tidyverse packages, Python, SQL, LaTeX, C, C++, MATLAB, R Shiny, Git

**Familiar:** Spark, SAS, Tableau, Sage, MS Office, Maple, HTML, XML, Adobe Analytics, Google Ads  
Google Search Ads 360, Qlikview

## TECHNICAL EXPERIENCE

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### BEST BUY CANADIAN CORPORATE HEADQUARTERS

05/2018 – 09/2018

#### Digital Analyst Intern – Ecommerce Department

**Job Description:** Worked in an agile development environment on a performance marketing engine for expanded assortment products. Developed a new method to model product conversion rates under a Bayesian Framework, developed an automated price optimization tool and developed a more efficient shipping cost attribution system. Managed and updated the Google Ads campaigns for the marketing engine. Finally, lead an overhaul of current processes to incorporate version control and more automation.

### CANADA SOCCER WOMEN'S NATIONAL TEAM

03/2018 – PRESENT

#### SEATTLE UNIVERSITY

#### GEORGIA SOUTHERN UNIVERSITY

##### Research Assistant

**Project Description:** Fit Critical Power Models using millions of rows of Catapult Biometric data over the course of training sessions and games with Eli Mizelman and Dr. Dave Clarke. The models will be used to better evaluate substitution patterns and training loads to prevent injury and promote more efficient performances. Each proposed theoretical model also needs to be evaluated, so we will evaluate the fit of each model and its effectiveness. Used spark interfacing with KEY | SFU Big Data compute cluster resources to manage the amount of data available.

### CANADIAN SPORT INSTITUTE PACIFIC

06/2017 – PRESENT

#### Research Assistant – Rowing Canada

**Project Description:** Lead a reproducible research project using GPS race data to determine optimal pacing strategies across various rowing events using k-Shape Clustering. Modelled the use of pacing profiles through a multinomial logistic regression on boat and race characteristics to find out which ones affected the speed curve of a boat. Project was a part of a directed studies course supervised by Dr. Jack Davis of SFU and Dr. Ming-Chang Tsai of CSIP.

#### Research Assistant – Canada Women's Rugby Sevens

**Project Description:** Analyzed both tagged data and Catapult Biometric data to explain score differential using a linear regression. Supervised by Eli Mizelman, a Sports Analytics PHD student, Dr. Dave Clarke, and Dr. Tim Swartz in collaboration with Dr. Ming-Chang Tsai of CSIP.

### SIMON FRASER UNIVERSITY MEN'S BASKETBALL

09/2018 – PRESENT

#### Research Assistant

**Project Description:** Working with Denis Beausoleil, an assistant coach, and Aaron Danielson to set realistic team goals for the 2018-2019 season. Developing a system to scout and identify talent in NWAC, CEGEP, CCCAA, and ACCAC Junior College Conferences. Finally, working on a project for the coaching staff to help set rotations and evaluate lineup efficiencies.

### CANADA BASKETBALL

06/2017– PRESENT

#### Lead Researcher

**Project Description:** Led a confidential research project for Canada Basketball, involving Bayesian Methods and Linear Models to predict player success across league play and international play.

#### Lead Developer

**Project Description:** Wrote R code to scrape, clean and format data from specific FIBA tournament games to the specification of Performance Analyst/Database Manager, Phil Jevtovic . This tool was used by Team Canada at the FIBA U19 World Championships where they won gold.

### UNIVERSITY OF BRITISH COLUMBIA MEN'S BASKETBALL

04/2018 – PRESENT

#### Project Leader

**Project Description:** Preliminary stages of working with the coaching staff to answer their questions about team performance and strategy.

### TERRY FOX SECONDARY JUNIOR BOYS BASKETBALL ANALYTICS

09/2017 – 03/2018

#### Project Leader

**Project Description:** Developed an innovative platform for collecting and analyzing data in high school basketball. Working intimately with the coaching staff to educate them about the value of analytics in their decision making.

<b>STRIDES STUDY</b> Statistical Consultant <b>Project Description:</b> Advised MSc student Stephanie Maganja and her supervisor Dr. Dawn Mackey on the statistical tests of their validity study of commercial-grade activity monitors. Helped write code to clean and model their data using an analysis of variance.	02/2018 – PRESENT
<b>NATURAL SCIENCE AND ENGINEERING RESEARCH COUNCIL OF CANADA</b> Undergraduate Student Research Award Recipient <b>Job Description:</b> Performed research in sports analytics and mathematical systems for gambling under Professor Dr. Tim Swartz at SFU's Department of Statistics. Derived a more conservative Kelly Criterion using a Bayesian approach, created an R Shiny app and co-authored a research paper that is now published in JQAS.	SUMMER 2017
<b>FRASER HEALTH – POPULATION AND PUBLIC HEALTH OBSERVATORY</b> Statistical Research Intern – Overdose Analytics <b>Job Description:</b> Performed ad-hoc analysis on areas of the overdose crisis in Fraser Health. Collaborated on a larger analysis using mixture model clustering to identify at risk groups and optimal intervention points. Investigated the higher rate of ambulance rejection after an overdose with a focus on the location of the patient.	05/2017 – 12/2017
<b>PROFESSIONAL &amp; UNIVERSITY SERVICE</b>	
<b>SFU SPORTS ANALYTICS CLUB</b> President, Accountant <b>Volunteer Responsibilities:</b> Organized projects and events for club members. Projects include work with Canada Basketball, Canadian Sport Institute Pacific, Seattle University, Georgia Southern University, SFU Basketball, Vancouver Whitecaps, UBC Basketball, Vancouver Canucks.	08/2015 – PRESENT
<b>VANCOUVER SPORTS ANALYTICS SYMPOSIUM &amp; HACKATHON</b> VanSASH 2018 Lead Event Organizer <b>Volunteer Responsibilities:</b> Planned the expansion of the event in September of 2018 to include 120 participants. This iteration included 2 divisions, soccer and business, each divided into 2 streams, data beginners and data experienced. Organized judges from the Executive Team and Coaches of the Vancouver Whitecaps, Vice President of Data and Analytics at Major League Soccer, and managers and data analysts from companies such as Best Buy, EA Sports, Boeing, Cardinal Path among others. VanSASH 2017 Lead Event Organizer <b>Volunteer Responsibilities:</b> Organized sponsors, speakers, venue, catering, grant requests and volunteers for the 100-person event in 2017. The event was sponsored by the Vancouver Whitecaps Football Club, Vancouver Canucks, Canadian Statistical Science Institute, Key Big Data Hub, Simon Fraser Student Society and many more. Additionally, was the host and a mentor at the event. See <a href="http://www.vansash.com">www.vansash.com</a> for more details.	01/2017 – PRESENT
<b>VANCOUVER WHITECAPS FC – SOCCER OPERATIONS</b> Game Day Analytics Intern & Volunteer Coordinator <b>Volunteer Responsibilities:</b> Filmed games and provided game day support for the analytics and scouting team. Organized, scheduled and trained new volunteers for the department.	03/2017 – PRESENT
<b>CASCADIA SYMPOSIUM ON STATISTICS IN SPORTS</b> Volunteer Coordinator <b>Volunteer Responsibilities:</b> Organized and scheduled volunteers, ran the registration booth and helped run the prize raffle for the event.	08/2018
<b>JOURNAL OF BIG DATA</b> Peer Reviewer <b>Volunteer Responsibilities:</b> Reviewed a paper for the Journal of Big Data.	SUMMER 2018
<b>ADMINISTRATIVE SCIENCES ASSOCIATION OF CANADA</b> Peer Reviewer <b>Volunteer Responsibilities:</b> Reviewed a paper for the Administrative Sciences Association of Canada Conference.	SPRING 2018
<b>STATISTICS &amp; ACTUARIAL SCIENCES STUDENT SOCIETY</b> Vice President <b>Volunteer Responsibilities:</b> Worked to improve the experiences of Statistics students at Simon Fraser University by vouching for their needs during society meetings and through organizing events. Provided insight and direction on the renovations of the Mathematics and Statistics & Actuarial Sciences Student Common Rooms.	FALL 2017

## SFU EXCHANGE

SPRING 2016 – SPRING 2018

### Exchange Ambassador

**Volunteer Responsibilities:** Attended pre-departure meetings, recruitment events and diversity events at Simon Fraser University and San Diego State University.

## TEACHING EXPERIENCE

### INTRODUCTION TO STATISTICS FOR THE SOCIAL SCIENCES

SUMMER 2018, FALL 2018

Tutor Marker

### PRIVATE MATH & STATISTICS TUTOR

03/2012 – 04/2018

Grade 10 - 2<sup>nd</sup> Year University Level Math Courses

## COMPETITIONS

### 1<sup>ST</sup> PLACE (\$300 CDN) – SFU SURJ RESEARCH POSTER COMPETITION

09/2018

**Project Description:** A research poster presentation competition for work done as an undergraduate student in science at SFU. Presented research on pacing profiles in 2000m rowing.

### TBA – JSM SIS UNDERGRADUATE RESEARCH COMPETITION

07/2018

**Project Description:** The Statistics in Sports section of the American Statistical Association sponsored the 2018 undergraduate research speed session/poster contest at the Joint Statistical Meeting in Vancouver, BC. I presented the development of the Modified Kelly Criterion.

### 1<sup>ST</sup> PLACE (PRIZE PACK) – SACRAMENTO KINGS CASE COMPETITION

03/2018 – 04/2018

**Project Description:** Used survival analysis, approximations to exponential distributions and bootstrapping methods to give personalized predictions of playing time an NBA player had before fouling out of a game given a number of fouls. Built a Shiny App for coaches to use on the sidelines as well as 6 page report to communicate our results.

### TOP 75 QUALIFIER – NSERC'S *SCIENCE, ACTION!* VIDEO CONTEST

01/2018

**Project Description:** Produced, wrote and promoted a 1-minute summary video of PhD candidate Trevor Thompson's research into spot fire simulators and their applications to forest fires.

### 1<sup>ST</sup> PLACE (\$350 CDN) – SFU BUSINESS ANALYTICS HACKATHON, VANCOUVER

11/2017

**Project Description:** Modeled customer retention for Grocery Consolidated with an ensemble model and made business recommendations based on our results.

### 1<sup>ST</sup> PLACE (\$125 CDN) – HOCKEY ANALYTICS DATA SPRINT, VANCOUVER

11/2017

**Project Description:** Analyzed the ability of AHL team to breakout of their zone on the power play. Provided rankings of the best and worst teams and gave areas to improve power play performance.

### COMPETITOR – NBA HACKATHON, NEW YORK CITY

09/2016, 09/2017

**2017 Project Description:** Points Gained Shooting – Created a new metric to measure shooting skill for basketball players across games, seasons and careers by calculating a player's shooting performance relative to a league average player.

**2016 Project Description:** Corner 3s, the Following Possession – Computed the rate of fast breaks created by shots from a given location using Sport VU data to determine offensive rebounding and transition defense strategies and rotations.

### 4<sup>TH</sup> PLACE (\$150 CDN) – MOJIO CASE COMPETITION, VANCOUVER

SPRING 2017

**Project Description:** Classified engine use based on how a car was driven using k-means clustering.

## BASKETBALL COACHING EXPERIENCE

### HEAD COACH

TC North Basketball Academy Junior Varsity Fall Travelling Team  
Dr. Charles Best Secondary School Junior/Senior Boys Basketball  
Grade 4 & 5 Private Skill Sessions

10/2016 – PRESENT

04/2013 – PRESENT

SUMMER 2017

### ASSISTANT COACH

TC North Basketball Academy 3 on 3 Spring Camps  
Tri-City Youth Basketball Association Seasonal Camps  
Canada Basketball – Centre for Performance Camp  
Special Olympics BC - Coquitlam Basketball  
Basketball BC U15 Fraser Valley North Regional Team

SPRING 2017. SPRING 2018

SUMMER 2016, WINTER 2016

FALL 2015, FALL 2016

WINTER 2015

SPRING 2015

**Description:** I have coached basketball for an average of 6 days a week while in season since 2013. I have travelled to the United States to coach in the North Cascades AAU Basketball League and other AAU tournaments. I have developed practice plans, game schedules and offseason training regiments for players of all ages. As the head coach, I have dealt with administrative duties and parental communications. Most importantly I strive to pass down my love for the game to my players and encourage them to develop a strong work ethic and mental toughness. I have experience pushing elite players to improve their skills, cultivating a love for the game with beginners, and teaching the game to those with unique physical and mental challenges.

## **MEDIA RECOGNITION**

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*SFU Sports Analytics Club runs VanSash, a hackathon for students and by students* (2018, September). [www.The-Peak.ca](http://www.The-Peak.ca)

*How the SFU Sports Analytics Club has become a big player within the sports analytics industry* (2017, November). [www.The-Peak.ca](http://www.The-Peak.ca)

*Vancouver Sports Analytics Symposium and Hackathon* (2016, June). [www.The-Peak.ca](http://www.The-Peak.ca)

## **REPORTS & BLOGS**

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**Chu, D.** and Reyers, M. *The Peak Stat of the Week: Strokes Gained* (2018, March). [www.The-Peak.ca](http://www.The-Peak.ca)

Reyers, M. and **Chu, D.** *The Peak Stat of the Week: SPARQ Scores* (2018, February). [www.The-Peak.ca](http://www.The-Peak.ca)

**Chu, D.** and Reyers, M. *The Peak Stat of the Week: Corsi* (2018, January). [www.The-Peak.ca](http://www.The-Peak.ca)

Lee, V., Bharmal A., Kinniburgh, B., ... **Chu, D.** ... *2017 Chief Medical Health Officer's Report on The Hidden Epidemic: The Opioid Overdoes Emergency in Fraser Health* (2018, January). Fraser Health Authority, Health Reports.