

# Sophie Chang

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## TECHNICAL SKILLS

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**Programming Languages:** Java, C++, html, css, Visual Basic

**Tools:** SolidWorks, Rapid Prototyping/3D printing, Matlab, git, github, gitlab

**Languages:** English, French (DELF: B2)

**Soft skills:** Communication, Collaboration, Time Management, Problem Solving

## EXPERIENCE

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### Northern Student-Led Arctic Research Program (NorthSTAR)

Sept 2023 – Aug 2025

*Kelvin High School*

*Winnipeg, MB*

- Collaborated with Dr. Waterman, Dr. McKinnon, Dr. Ross and other student researchers to collect data to analyse the body health index of **37 individuals** of the Western Hudson Bay polar bear population
- Found a downwards trend in polar bear health by analyzing **13 years of data** for health trends in the overall population using **3 different methods** to determine body condition
- Presented a poster comparing **3 methods** of accessing polar bear health at the Canadian Society for Ecology and Evolution 2024 (Vancouver) and the 2024 Manitoba Chapter Wildlife Society Annual Meeting (Winnipeg)

### Mechanical Subteam Member

Sept 2025 – Present

*Biomechatronics Design Team*

*Waterloo, ON*

- Collaboratively and iteratively designed a low-cost mechanic exoskeleton hand which **cost \$10** to aid people with low hand strength using SolidWorks
- Designed and modeled **1 degree of freedom** joints in SolidWorks to optimize parts spacing
- Rapidly prototyped a pin locking mechanism in SolidWorks to provide external structural support for the hand

## PROJECTS

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### Reach for the Top points counter | C++, CLion

- Improved the documentation of Reach for the Top games to reduce the paper usage of coaches by creating a program that implemented object oriented programming strategies
- Added features to allow users to see the game history of players by implementing a file saving mechanism

### Checkers | Java, Apache NetBeans

- Built a functional a 2-player checkers game, integrating win-state detection, board depiction and move validation
- Developed a button based checkers board GUI using java.swing to display the board in an intuitive fashion
- Tracked checker stones and king states and positions using a matrix based system to manage board logic

### Battleship | SolidWorks, Engineering Drawings

- Collaboratively engineered an accessible version of Battleship, tailored for young children with dyspraxia to improve their fine-motor skills by **reducing grip-strength needed by 80%** with a raised grid system
- Optimized dimensions of parts to a **0.0 tolerance** by testing low fidelity prototypes designed in SolidWorks

### Sword in the Stone | SolidWorks, Rapid Prototyping, Engineering Drawings

- Co-designed a 3D printed puzzle with **7 pieces**, featuring a pin locking mechanism and sliding parts
- Created drawings with dimensions and tolerances to aid in cross-team communication and effective presentations
- Iteratively designed pieces using design-for-manufacturing principles and rapid prototyping to optimize for easy assembly and cost-effective and time-effective fabrication with the final print taking **4 hours and cost \$4**

## EDUCATION

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### University of Waterloo

Waterloo, ON

*Bachelor of Applied Science in Biomedical Engineering | 3.9 GPA*

*Class of 2030*

- Courses: Data Structures and Algorithms, Linear Algebra, Calculus I and II, Visual Communication in Engineering, Statics

## HOBBIES AND INTERESTS

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**Member:** Kelvin Highschool Reach for the Top team (won provincials, went to nationals)

**Volunteering:** Middle school hurdles coach, Angel Tree Christmas church coordinator, Festival du Voyageur

**Sports:** Ultimate Frisbee (UWaterloo and Canadian Junior Ultimate Nationals), Track and Field (4x provincials)