Sophie Chang

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Technical Skills

Programming Languages: Java, C++, html, css, Visual Basic, Python
Tools: SolidWorks, Rapid Prototyping/3D printing, Matlab, git, github, gitlab
Languages: English, French (DELF: B2)
Soft skills: Communication, Collaboration, Time Management, Problem Solving

Experience

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
- Communicated effectively so that handoffs are smooth and dimensions between parts are correct

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 determining polar bear health at the Canadian Society for Ecology and Evolution 2024 (Vancouver) and the 2024 Manitoba Chapter Wildlife Society Annual Meeting (Winnipeg)

Projects

Sword in the Stone | *SolidWorks, Rapid Prototyping, Engineering Drawings, SolidWorks Composer*

- Co-designed a 3D printed puzzle with **7 pieces**, featuring a pin locking mechanism and sliding parts
- Produced an assembly manual in SolidWorks Composer to guide streamlined assembly processes
- 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**

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
- Drafted engineering drawings for manufacturing and envisioning the final product
- Wrote formal reports and recorded design decisions using a design history file

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

Education

University of Waterloo Waterloo, ON
Bachelor of Applied Science in Biomedical Engineering | 3.9 GPA *Class of 2030*

- Courses: Visual Communication in Engineering, Calculus I and II, Statics, Introduction to Design

Hobbies and Interests

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)